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Supplementary Information

Oral presentation

Submission from the Canadian Environmental Law Association

In the Matter of

Bruce Power Inc.

Application to renew the Power Reactor Operating licence for the Bruce A and B Nuclear Generating Stations

Commission Public Hearing

April 13 to 16, 2015

Renseignements supplémentaires

Exposé oral

Mémoire de l'Association canadienne du droit de l'environnement

À l'égard de

Bruce Power Inc.

Demande concernant le renouvellement du permis d'exploitation pour les centrales nucléaires de Bruce A et B

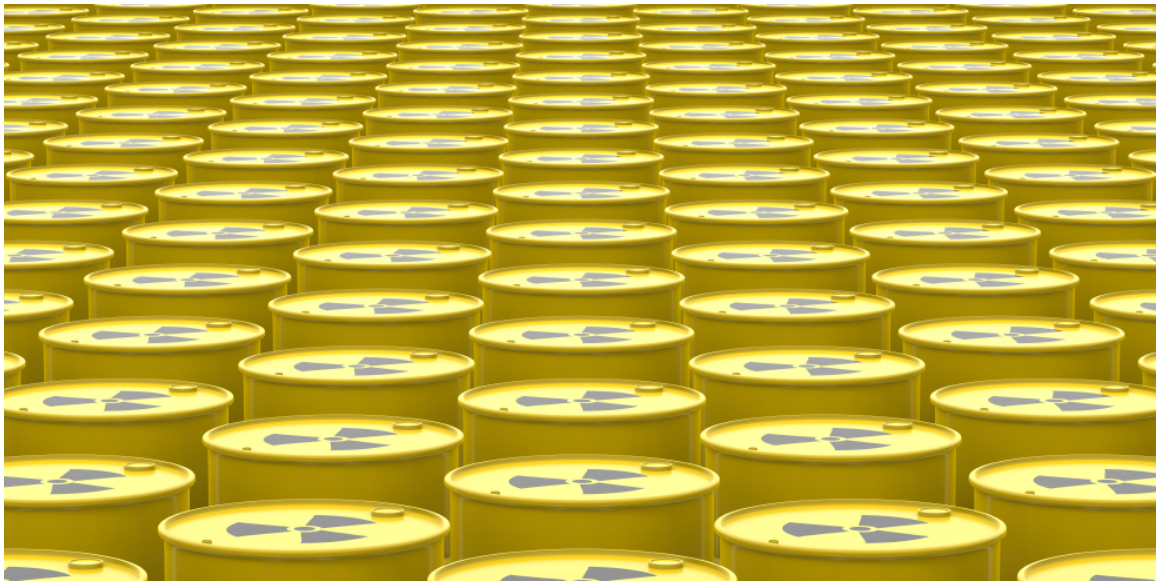
Audience publique de la Commission

13 au 16 avril 2015

Canada

Canadian Environmental Law Association
EQUITY. JUSTICE. HEALTH.

Bruce A and B Reactor Relicensing and the Emergency Management Regulatory System



Submission by the Canadian Environmental Law Association

Theresa McClenaghan, Executive Director and Counsel
&
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March 16, 2015
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Hearing Ref.

Bruce Power Day Two Hearing on application to renew the reactor operating license for the Bruce Nuclear Generating Stations A and B

Canadian Environmental Law Association: Review and Submissions on Bruce A and B Reactor Relicensing and the Emergency Management Regulatory System

March 16, 2015

Revised March 20 and April 7, 2015

Dear Ms. Levert:

The Canadian Environmental Law Association requests to Intervene at the Day Two Hearings in the above-referenced matter. Please find attached our submissions in respect of our review of emergency planning at the Bruce Power Nuclear Generating Stations.

Theresa A. McClenaghan

Executive Director and Counsel

Canadian Environmental Law Association

OVERVIEW OF CONTENTS

SUMMARY OF RECOMMENDATIONS

Recommendation #1: The CNSC should require Bruce Power to demonstrate that the offsite emergency plans in place for Kincardine and the Bruce Plant, taking account of the provincial and federal plans, would mitigate offsite impacts of an INES Level 7 accident at their plant such that those offsite impacts would not result in impacts to the health of persons resident within the primary or secondary zones of the Plant (and subject to the recommendations contained herein as to expansion of those zones).

Recommendation #2: The Ontario nuclear planning basis be established as requiring the plan to demonstrate it is sufficient to respond and prevent human health effects in the case of nuclear emergencies that exceed INES 7. CELA recommends that the CNSC strongly urge Ontario to revise its planning basis accordingly and otherwise to exercise its own jurisdiction to scrutinize the Ontario plans as to their ability to respond and effectively protect the public from the effects of nuclear emergencies that exceed INES 7.

Recommendation #3: The CNSC should require Bruce Power to conduct studies and to work with offsite emergency responders, Kincardine, and the Province of Ontario to ensure that there are realistic evacuation plans in place to respond to a severe accident with early large release, and should insist that these provisions are included in a revised provincial nuclear emergency response plan.

Recommendation #4: KI pills should be pre-distributed to everyone within 50 km of the plant and selectively pre-distributed to vulnerable communities within 100 km.

Recommendation #5: The primary zone should be extended to 30 km. This extension should include consideration of detailed warning systems, initial

communications, evacuation, and other protective actions relevant to the primary zone.

Recommendation #6: With the new warning system efforts being undertaken by Bruce Power as outlined by them in Day 1 and described in Section B to this submission, we recommend that the CNSC review and confirm in detail the status of those systems at an annual public meeting of the Commission.

Recommendation #7: Expand the secondary zone to 100 km.

Recommendation #8: The CNSC should direct Bruce Power to work with Kincardine to ensure that detailed and specific information about evacuation routes are provided directly in written form annually to all residents within the primary and secondary zones of the Bruce power plant, as well as made available in other formats including posting to the Kincardine and Bruce Power websites. CELA recommends that this information should be checked annually, and that the Commission should seek specific confirmation as to the manner in which this information is provided annually to the public.

Recommendation #9: The CNSC should direct Bruce Power to work with Kincardine to ensure that detailed, concrete and reciprocal arrangements are made to accommodate students and long term care residents in the case of an evacuation of their institution; and that those arrangements are communicated publicly and in advance to all parents and families of those students and residents.

Recommendation #10: Kincardine should collect information on the institutions serving vulnerable residents and provide transparent information to the public in brochures or other outreach material and on its website as to the evacuation plans that would be implemented in the case of a nuclear

emergency that requires evacuation. Given CELA's recommendation to expand the primary zone to 30 km, this should be done for all such institutions serving vulnerable communities within 30 km of the plant boundaries. Further, like information should be gathered for the secondary zone (currently 50 km but recommended to expand to 100 km) so as to be able to expeditiously respond to more severe circumstances.

Recommendation #11: The public should clearly understand what plans are in place to assist them with evacuation from the Primary Zone if they do not have their own transportation. What those plans are should be clearly specified in the Kincardine Nuclear Emergency Plans, and widely communicated to the public in outreach and education.

Recommendation #12: Along with upgrading the planning basis to account for much more severe offsite effects, the province and the Kincardine and Bruce plans should increase the numbers of casualties planned for; ensure that the initial response, transport and treatment capacity would be in place for increased numbers, and include those larger numbers in regular testing of the emergency plans.

Recommendation #13: The CNSC should request Bruce Power to include in its outreach material to the public, in conjunction with regional emergency response officials, explanations about the capability of sheltering and its limitations as described in the IAEA Guide GS-G-2.1 and to reinforce instructions as to steps to take for rapid and effective evacuation in the case of notification of a significant emergency.

Recommendation #14: The default Ingestion Control Zone should be enlarged and extended to 100 km from the Bruce nuclear power plant. CELA recommends that the CNSC should satisfy itself that the province has in place capability to monitor food stuffs province wide in the event of a nuclear

emergency at the Bruce plant prior to making a licensing decision on continued operations.

Recommendation #15: The Town of Saugeen Shores should post its Nuclear Emergency Plan online on its website.

Recommendation #16: The Town of Saugeen Shores website should clearly articulate its hosting role under the PNERP and provide essential information to the public in that regard.

Recommendation #17: All nuclear emergency information relating to Saugeen Shores should be gathered together in one location so that a member of the public looking at the website in a nuclear emergency will see essential information regarding obtaining of updates, advice, sheltering, evacuation, reception centres and other key matters.

Recommendation #18: As a licensing condition, Bruce Power should be required to fully implement the public notification programs that are currently in their testing phase.

Recommendation #19: As a licensing condition, Bruce Power should be required to conduct several ongoing public outreach programs, including but not necessarily limited to town meetings and presentations, call lists, door-to-door distribution of informational materials, and maintaining a website with all relevant emergency response information on it. These efforts should happen on a regular schedule and repeat themselves at least once annually.

Recommendation #20: Bruce Power and Kincardine should work together to maintain lists of people who will need special accommodations for emergency notification and evacuation.

Recommendation #21: Since it has been at least nine years in the making and still unreleased, the CNSC should set a firm timeline for Kincardine to complete Appendix N, "Emergency Procedures", and thereby its nuclear emergency response plan.

Recommendation #22: The provisions contained in the "Guidance" sections of Reg. Docs 2.3.2 and 2.10.1 should be made mandatory and as such should be rewritten with binding language (e.g. "will" and "must" vs. "should" and "may").

Recommendation #23: The CNSC's assorted regulations and the Conditions contained in the proposed License and Licence Conditions Handbook (*LCH)* (since it is unlikely that new regulations will be made in time for an official decision on the BP license) should be expanded to contain specific provisions making what will be sufficient consideration or planning for different disasters clear. This must include engineering and scientific standards that make what will be sufficient evidence of a claim about the nature of a potential situation and the sufficiency of a proposed solution to it clear.

Recommendation #24: Since CSA standards, like N1600-14,[1] do not always themselves offer technical standards, the CNSC should conduct its own studies to create and implement them where they are currently absent. The regulations should be updated accordingly.

Recommendation #25: Any private standards incorporated into regulations or a licensing decision should be made readily publicly accessible as well. Doing this would greatly enhance regulatory clarity, predictability, and consistency for the public.

[1] *N1600-14: General Requirements for Nuclear Emergency Management Programs*, CSA Group.

Recommendation #26: As it creates new and specific technical standards, the CNSC should publish all of the studies it conducts to develop and implement them in an accessible, user-friendly index on its website so that the public and outside experts can easily find and review them. To the extent that publishing them in both of Canada's official languages is a problem, the CNSC should hire additional translation staff. Using this as a reason to avoid publication goes against the purposes of having both official languages and is not a valid reason for withholding important public information.

Recommendation #27: The CNSC should revise Reg. Docs 2.3.1 and 2.10.1 and add Conditions to the License and *Licensing Conditions Handbook (LCH)* so that the CNSC will be solely responsible for the development and implementation of testing methodologies and scenarios that examine whether existing emergency response/management systems actually work. The CNSC should also develop its own data analysis methodologies and testing pass/fail standards and publish them so that the public is aware of what exactly adequate emergency response will be and to eliminate the potential for pro-licensee bias in the system. This will both improve the system's transparency and give the public a more appropriate level of input in these processes.

Recommendation #28: The CNSC should conduct its own gap analysis to determine what aspects of nuclear safety and emergency management are not covered by existing regulations and safety/emergency response plans. Ensuring that all safety concerns are addressed is the job of a regulator, not a licensee. Based on this, the CNSC should add further conditions to the Bruce Power License and begin to develop further accident management and safety regulations that will address any issue that the existing regulations do not.

Recommendation #29: The CNSC should conduct its own technical analyses to determine what accident/emergency scenarios are possible, what should be responded to and the standards for deciding this (e.g. natural disasters of a certain probability), and how they should be responded to (including what an acceptable tolerance for error/failure is). This should form the basis for the more definite standards called for in **Recommendations 22-27**. Further, as the regulations related to this issue are often couched in guidance, provisions instructing licensees as to what they should plan for should be made mandatory.

Recommendation #30: Information disclosure requirements should be mandatory, and explicitly state what kinds of information need to be disclosed and how frequently they need to be updated.

Recommendation #31: CNSC monitoring staff present at the facilities and emergency response areas should continuously gather data independently on their own and build a public record with it. To the extent that CNSC staff would not have access to the same information as licensee staff, CNSC staff should be given the same access to ensure openness. CNSC staff should conduct its own analysis of the data, rather than relying on licensees for interpretation and response guidance. If the CNSC's current staff is insufficient, because nuclear accidents are such a serious threat to the public, it is worth investing in more staff.

Recommendation #32: Because of the volume of analysis that is conducted by Bruce Power in support of licensing decisions and other important regulatory decisions by the CNSC, Bruce Power should enter into a written agreement with the CNSC to subject itself to *FIPPA*.

Recommendation #33: The proposal to operate Bruce Power units beyond the originally designed lifespan of 210,000 Effective Full Power Hours of pressure tubes should be denied.

A. Planning Basis and Emergency Response – Kincardine Nuclear Emergency Plan

Why does emergency preparedness matter? The International Commission on Radiological Protection in Publication 109 states that dose and exposure pathways from a nuclear emergency are likely to include initially a relatively high dose rate with inhalation of short-lived beta/gamma emitters during dispersion of the plume; followed by days or weeks when I-131 dominates the exposure (I-131 is also important in the early part of a release); followed by external irradiation from contamination deposited in the environment and ingestion exposure from direct contamination on crops and milk. Emergency planning aims to avoid or reduce these exposures.

The Federal Emergency Response Plan found at http://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/mrgnc-rspns-pln/index-eng.aspx on the Public Safety Canada website dates to January 2011. This is a general plan to cover all emergencies. Under that plan, Transport Canada's response functions include matters such as restricting traffic and providing technical emergency advice on hazardous materials.

The Federal Nuclear Emergency Plan found on the Health Canada website is specific to nuclear hazards: http://www.hc-sc.gc.ca/hc-ps/ed-ud/fedplan/intro-eng.php. It sets out goals such as regaining control of the situation, preventing doses to persons, and preventing radiological health effects. It provides notification, advice, field support and other functions for nuclear emergencies.

Ontario's Provincial Nuclear Emergency Response Plan (PNERP) dates to 2009: https://www.emergencymanagementontario.ca/english/emcommunity/response_resources/plans/provincial_nuclear_emergency_response_plan.html. (Accompanying the Provincial Plan are Implementing Plans for each of the commercial power reactors, and there is a PNERP Implementing Plan for Bruce Power, 2009). The PNERP requires detailed planning for an accident where "doses would be low". More severe accidents only require "appropriate

additional planning and preparedness." The Bruce Power Implementing Plan repeats the PNERP's assumptions for the planning basis at section 2.2.2(b) as follows:

> "The principal characteristics of the basic offsite effect would be: (i) A warning period would usually exist before the offsite effects occur. (ii) The main hazard to people would be from external exposure to, and inhalation of radionuclides. (iii) Doses would be low. (For planning purposes it can be assumed that the individual dose to the most exposed person at the station boundary will not exceed 250 mSv (25 rem)). (iv) Environmental contamination would be limited to very low levels. 5 (v) Low-level radioactive emissions to the environment could continue for some time (i.e., days or weeks). (vi) The impact would mainly be confined to the Primary Zone around the nuclear station (paragraph 2.4.2 below)."

While the Bruce Power Implementing Plan at section 2.2.3, like the PNERP itself, acknowledges the possibility of more severe accidents with higher doses, a larger affected area, and less time between the accident and a release, this has not so far translated into more detailed actual emergency planning and preparedness in Ontario. This remains true at the Bruce nuclear plant.

As noted above, the planning basis for Ontario's nuclear emergency plans refers to the amount of off-site effects that might result from a nuclear emergency. There have been previous attempts to review the nuclear emergency planning basis in Ontario. For example, some years after the tragic Chernobyl accident in the Ukraine in 1986, Ontario embarked on some review of its plans. Only seven years later was the matter considered in an Ontario Cabinet committee.

The Ontario Cabinet Committee on Environmental Policy Report Nov. 18, 1993 (pp. 4-5, 12) recommended that:

a) The planning basis for nuclear emergencies in Ontario should be revised to prepare for accidents "beyond the current design basis" to "include the possibility of more severe accidents".

b) The Nuclear Emergency Plan would provide the best method for making Potassium Iodide pills available to all residents in the contiguous zone.

c) The primary zones for Darlington and Bruce should be extended to 13 kilometres instead of the current 10 kilometres (but Pickering was to remain at 10 kilometres).

d) An appropriate warning system satisfactory to the Ministry of the Solicitor General and Correctional Services was to be implemented in the contiguous zone.

e) Evacuation plans for priority movement and monitoring/decontamination of people from within the contiguous zone were to be upgraded.

f) Arrangements for the medical treatment of persons from the zone who could suffer early health effects were to be established.

g) Persons living within the contiguous zone were to be instructed in the proper response techniques in case of such an accident.

h) Upgrades to the level of preparedness necessary to implement the measures in provincial and municipal nuclear emergency plans were to be made.

i) The control infrastructure necessary to manage a serious nuclear emergency was to be enhanced.

j) Procedures for the utilization of national and international assistance to augment provincial resources were to be established.

(See copy of this recommendation to Cabinet provided in Appendix 4)

These recommendations were in the main not adopted in Ontario. Furthermore, another nuclear disaster in occurred in Fukushima in March 2011, fully four years ago.

In the following section, CELA evaluates the status of offsite emergency preparedness around the Bruce Nuclear generating station in comparison to the above noted 1993 cabinet recommendations to ascertain the level of progress. Our review is current as of March, 2015 and is based on the public record and responses by Bruce Power and the Municipality of Kincardine to our enquiries. We note the status of these items as follows:

I.a. Planning Basis

Twenty-two years after these recommendations were made to the Cabinet, CELA understands from meetings and communications with the Province that it is embarked upon a review of the planning basis for nuclear emergency planning. However, despite a commitment from the former Minister of Community Safety and Correctional Services Meilleur in October 2013 to involve the public in the review and development of the next PNERP, that Ministry and the Province have not yet included the public in the discussions about the appropriate planning basis. However, it appears that this work is underway by the province without the public.

As CELA has noted in other submissions previously, the historic emergency planning basis in Ontario was insufficient in that it planned and prepared for a less severe accident in which there could be one casualty at the

plant boundary, but not for severe, multi-unit accidents; nor for other versions of catastrophic nuclear emergencies with either early release or widespread release of radioactive contaminants. The basis for this approach was a combination of beliefs that more severe accidents were unlikely, as well as that preparing for a more severe accident was too expensive. Post Fukushima, this type of approach is no longer publicly acceptable nor rational. Detailed preparation for catastrophic type nuclear emergencies must be in place in Ontario such that there would be a realistic opportunity to prevent serious human health impacts. If this cannot be done, the plants should not operate. This is within the purview of the CNSC with its jurisdiction and obligation to prevent unreasonable risks to human health or the environment.

A continuing problem is the obfuscation of the type of accident that the public expects the operators and regulator to protect them from in the event of a nuclear emergency. CELA agrees with the Greenpeace recommendation to use the International Nuclear Event Scale (INES) and to require that the planning basis in Ontario be for an accident classified as greater than INES 7. The INES's objective *"…is to facilitate communication and understanding between the technical community, the media and the public on the safety significance of events."* The INES scale categorizes events accidents based on ranges of radioactive releases in Becquerels. On this scale, both Fukushima and Chernobyl accidents would exceed INES 7, which is described as: "Widespread health and environmental effects. External release of significant fraction of reactor core inventory."

Recommendation #1: The CNSC should require Bruce Power to demonstrate that the offsite emergency plans in place for Kincardine and the Bruce Plant, taking account of the provincial and federal plans, would mitigate offsite impacts of an INES Level 7 accident at their plant such that those offsite impacts would not result in impacts to the health of persons resident within the

primary or secondary zones of the Plant (and subject to the recommendations contained herein as to expansion of those zones).

Recommendation #2: The Ontario nuclear planning basis be established as requiring the plan to demonstrate it is sufficient to respond and prevent human health effects in the case of nuclear emergencies that exceed INES 7. CELA recommends that the CNSC strongly urge Ontario to revise its planning basis accordingly, and otherwise to exercise its own jurisdiction to scrutinize the Ontario plans as to their ability to respond and effectively protect the public from the effects of nuclear emergencies that exceed INES 7.

b. Early Release of Radionuclides in a Nuclear Emergency

As we note below under the topic of sheltering, a significant issue of ongoing concern to the public is that in the event of an early release of radionuclides from a nuclear emergency, there could be considerable periods of exposure to either public members who are sheltering or to the evacuating public. That is, planning must consider a scenario where the assumptions made by Ontario operators and emergency planners—namely that radioactive emissions from the plant will be kept inside containment for the first 2.5 days as provided in the Provincial Bruce Nuclear Emergency Implementing Plan 2009 section 2.6.1—are incorrect. The planning basis in Ontario should plan for an accident where due to some event, radioactive emissions occur immediately or within a very short time of an accident. While the Bruce Nuclear Implementing Plan acknowledges this possibility in the case of breach of containment, it is not apparent that this has affected the planning basis in Ontario and the province has not required detailed planning to reduce exposures to the public in this type of situation.

Recommendation #3: The CNSC should require Bruce Power to conduct studies and to work with offsite emergency responders, Kincardine, and the Province of Ontario to ensure that there are realistic evacuation plans in place to respond to a severe accident with early large release, and should insist that these provisions are included in a revised provincial nuclear emergency response plan.

II. Potassium Iodide (KI) pills

Potassium Iodide (KI) pills are not yet distributed to residents around the Bruce Nuclear Power Plant as of the date of this report (April 2015[2]). CNSC Reg. Doc 2.10.1, Nuclear Emergency Preparedness and Response, issued by the CNSC in the fall of 2014 and a resulting amendment to the Bruce Power License Conditions Handbook requires that KI pills be pre-distributed to all residents within 10 km of the Bruce nuclear plant before the end of calendar year 2015. At the Day 1 hearing held before the CNSC on Feb. 5, 2015, Bruce Power indicated it intends to have KI pills distributed to all residents within 10 km before their return before the Commission with the remainder of the hearing in April 2015. Whether or not this has been done should be verified by the Commission.

The current 10 km pre-distribution (governed by the current primary zone distance, which is arbitrary) excludes pre-distribution of KI pills to the residents of Kincardine. However, **CELA recommends (#4)** that KI pills should be pre-distributed to everyone within 50 km of the plant and selectively pre-distributed to vulnerable communities within 100 km.

There have been further international developments since the last Commission hearings on the Darlington and Pickering licenses in the Durham Region in 2012 and 2013. For example, in Switzerland KI is being pre-

[2] The website maintained by Bruce and neighbouring counties also states that KI pills "will" be distributed. http://www.bepreparedgreybrucehuron.com/nuclear/.

distributed within 50 km of each plant. (See in French http://www.jodtabletten.ch/fr/home). In March 2015, the Belgian Conseil Superieur de la Sante released a report recommending KI be pre-distributed to pregnant women within 100 km of Belgian reactors. (See in French: http://www.health.belgium.be/internet2Prd/groups/public/@public/@shc/documents/ie2divers/19101670.pdf). As to the effectiveness of KI distribution, see the May 2014 CNSC fact sheet "Potassium Iodide an Effective Measure": http://www.nuclearsafety.gc.ca/eng/resources/educational-resources/feature-articles/potassium-iodide-an-effective-protective-measure.cfm.

III. Extension of Primary Zone

The primary zone has not been extended around the Bruce NPP and remains at 10 km. The primary zone set out in the Bruce Nuclear Emergency Implementation Plan 2009 is included as Appendix 2 to this Report. This recommendation from the Ontario cabinet committee in 1993 to expand the primary zone was never acted upon nor implemented. Given the experiences at Chernobyl and Fukushima, the primary zone must be extended. This is the area within which detailed planning to protect the public would occur.

Recommendation #5: The primary zone should be extended to 30 km. This extension should include consideration of detailed warning systems, initial communications, evacuation, and other protective actions relevant to the primary zone.

IV. Appropriate Early Warning System

The early warning system at Bruce nuclear is outlined in more detail in Section B of this Submission. As noted above, the initial early warning system

must be implemented within an expanded primary zone. However it is a major concern that the early warning systems in Ontario do not appear to have been the subject of concerted attention by the Ministry of Community Safety and Correctional Services, the regulator, or the operators until after the Fukushima accident.

Recommendation #6: With the new warning system efforts being undertaken by Bruce Power as outlined by them in Day 1 and described in Section B to this submission, we recommend that the CNSC review and confirm in detail the status of those systems at an annual public meeting of the Commission.

V. Upgrading of Evacuation Plans for Priority Movement of People within the Contiguous Zone

ICRP Publication 109 indicates that the purpose of evacuation is to provide "rapid, temporary removal of people from an area to avoid or reduce short-term radiation exposure in an emergency exposure situation." It also states that it is "most effective if it can be taken as a precautionary measure before there is any significant release of radioactive material" (at page 66). Health Canada's Guidelines for Intervention indicates that "the goal of evacuation is to avert elevated short-term doses arising mainly from the radioactive plume (external irradiation and inhalation) and from radionuclides deposited on the ground (external irradiation). Evacuation has the potential to avert most or all doses if carried out in the pre-release phase of an accident. Evacuation is effective for reducing exposures in cases where the release is of uncertain size or duration" (at 18).

Evacuation is contemplated for defined response sectors extending to approximately 10 km from the Bruce Power site. The KERP delineates each sector within that zone and states that the provision of traffic control is undertaken by the Ontario Provincial Police with Ministry of Transportation

Ontario assistance. (S. 10.3.1 KERP). The Municipality of Kincardine's "Red Pages" as posted to its municipal website appear to be dated to 2006. Only by searching "Red Pages" was this document obtained; but it is likely most people would not know or think to conduct such a search and find this document. It is not clear that this document has routinely been distributed to members of the community nor is it clear that the information contained therein has been noted by most members of the community. The Red Pages require a close reading to determine what evacuation routes should be followed by those who live within 10 km of the plant. This information must be more directly communicated to the public in advance in order to be useful in a nuclear emergency. According to personal communication with staff of the Municipality of Kincardine, the Red Pages are no longer published in the telephone book and so have not been distributed to the community in some time. CELA was advised that Kincardine is working on new nuclear emergency communication material with Bruce Power and anticipates completing and delivering this material in spring of 2015.[3] Bruce County's existing emergency response website also provides little concrete information to residents.[4] Accordingly, it would appear that there has been a gap of some time without emergency information such as evacuation planning having been provided to the residents living near the Bruce nuclear plant.

Beyond the 10 km primary zone, the Kincardine nuclear response plan states that "it is not felt necessary to have detailed plans in place to provide immediate protection for the public beyond 10 km from the Bruce Power site", although it does plan for monitoring the effects of any potential contamination of agricultural products. (Section 2.2.3 Kincardine Nuclear Emergency Plan (KNEP)). The extent of the plan providing for evacuation in the secondary zone is found at section 9.3.1(d) of the KNEP which states:

[3] Personal communication with Jeremy Dixon, LPP Candidate with Canadian Environmental Law Association, Municipality of Kincardine March 13, 2015.
[4] "Be Prepared for a Nuclear Emergency", http://www.bepreparedgreybrucehuron.com/nuclear/.

> "**Secondary Zone Evacuations** – The Provincial Emergency Operations Centre will coordinate any evacuations that are required in the Secondary Zone with the appropriate municipality."

As noted earlier, CELA recommends expansion of the primary zone to 30 kilometres. This would include upgrading the plan to include detailed evacuation plans for residents and visitors within 30 kilometers of the plant. **CELA also recommends (#7)** upgrading the secondary zone to 100 kilometres, including advance planning to be able to effectively and quickly initiate all of the protective actions relevant to the secondary zone. This would include evacuations beyond the primary zone. The current secondary zone from the Bruce Nuclear Emergency Implementation Plan 2009 is attached as Appendix 3 to this Report.

It should be noted that much more detailed information is available to the public in Durham Region for the evacuation plans pertaining to the Darlington and Pickering nuclear generating stations than is available to the public around the Bruce nuclear plant. For example, the DNERP (2011) states that "Durham Region must have a plan for the pickup of people without vehicles and their transportation out of the PZ." Even this level of detail is not enough, as it is not evident in the Durham Plan what those plans are or where those plans would be located by members of the public. However, even less information appears to be available about evacuation around the Bruce. The Durham plan in its Durham Region Nuclear Evacuation Information Annex B, January 2008, lists for each sector the special care facilities (child cares, retirement homes), schools (all with numbers of residents, students, staff), as well as recreation centres, parks, and the locations of emergency services, works, services, and vital services such as health centres that would need to be evacuated. It also notes motels and hotels when present in the sector. None of this information is available for the public around the Bruce plant. It is not

apparent that the Kincardine Nuclear Emergency Response Plan has collected comparable information for these populations of vulnerable residents, and this should be done.

Specifically considering schools and long-term care facilities, the Toronto NERP states that the City is to assist the School Boards in developing their emergency plans for movement of students to pre-arranged host schools and if necessary to Monitoring and Decontamination Units; and that Long Term Care Facilities are to have pre-arranged reciprocal arrangements with like facilities outside the "Hot Zone" to accommodate their residents (at 4.7.3). There are no comparable provisions in the Kincardine plan.

In general, Ontario's nuclear emergency response plans expect the public to make their own arrangements in the event of evacuation. The appropriateness of this approach should further be discussed with the public in future nuclear emergency planning. Questions as to methods of transportation for those lacking personal vehicles, or whose household vehicles cannot return due to the evacuation should be answered clearly, to provide advance information to parents as to how they will be able to collect their children and to families as to how to re-unite with their loved ones. It is not evident in the Kincardine NERP that any arrangements are currently in place in regard to these questions; if they are, they are not apparent to the public.

In the meantime, the provisions of the Provincial Bruce Nuclear Implementing Plan (2009) provide some specific direction about avoiding the primary zone during evacuation, but these are not reflected in the Red Pages that are posted. Additional specifics required in the Kincardine Plan are in the Provincial Implementing Plan regarding evacuation, including topics such as mass evacuations of those without transport, medical assistance, reception and care details in respect of evacuees, and evacuation of schools and institutions. None of this was evident in the Kincardine Nuclear Emergency Plan on CELA's review, and queries of the municipality have advised that portions of the plan are not yet completed.

Recommendation #8: The CNSC should direct Bruce Power to work with Kincardine to ensure that detailed and specific information about evacuation routes are provided directly in written form annually to all residents within the primary and secondary zones of the Bruce power plant, as well as made available in other formats including posting to the Kincardine and Bruce Power websites. CELA recommends that this information should be checked annually, and that the Commission should seek specific confirmation as to the manner in which this information is provided annually to the public.

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Recommendation #10: Kincardine should collect information on the institutions serving vulnerable residents and provide transparent information to the public in brochures or other outreach material and on its website as to the evacuation plans that would be implemented in the case of a nuclear emergency that requires evacuation. Given CELA's recommendation to expand the primary zone to 30 km, this should be done for all such institutions serving vulnerable communities within 30 km of the plant boundaries. Further like information should be gathered for the secondary zone (currently 50 km but recommended to expand to 100 km) so as to be able to expeditiously respond to more severe circumstances.

Recommendation #11: The public should clearly understand what plans are in place to assist them with evacuation from the Primary Zone if they do not

have their own transportation. What those plans are should be clearly specified in the Kincardine Nuclear Emergency Plans, and widely communicated to the public in outreach and education.

VI. Arrangements for Medical Treatment—Ontario Radiation Health Protection Plan (RHPP)

A long promised provincial Radiation Health Protection Plan (RHPP) was finally released by the province of Ontario in 2014. Called for at least since 2009 in the last updated provincial PNERP, the RHPP had not been completed until last year. The RHPP is now posted on the MOHLTC website http://www.health.gov.on.ca/en/pro/programs/emb/rhrp/docs/radiation_health_response_plan.pdf. An accident or release from transportation or a waste facility would be called a "radiological emergency" under the RHPP—everything other than nuclear power plants or other major nuclear installations. Accidents at the power plants are called "nuclear emergencies". In either case, the emergency occurs according to the RHPP when there is "actual or potential hazard to public health, property, and/or the environment from ionizing radiation."

The RHPP uses the principles of "time, distance, and shielding" to reduce dose by internal or external exposure to radionuclides as follows:

- Reduce the time of exposure
- Increase the distance from the source
- Shield people from the source

(CELA notes that shielding is only suitable for some types of radio-nuclides).

The RHPP states that reducing internal radiation exposure can be achieved through the following actions:

- Wearing appropriate personal protective equipment
- Controlling the spread of loose contamination

- Decontaminating individuals and items in a timely manner
- Treating with appropriate pharmaceuticals in a timely manner; e.g. potassium iodide, Prussian blue.

According to the RHPP, medical treatment may have to be provided by first responders in a nuclear or radiological emergency, including such matters as providing first aid, triage, transport to hospitals, and helping to prevent the spread of contamination. Medical treatment may also have to be provided by hospitals in the vicinity of the emergency: as first receivers of injured and/or contaminated victims; provision of medical care; and preventing spread of contamination. Certain hospitals are designated as part of the Provincial CBRN (Chemical, Biological, Radiological, and Nuclear) Emergency Preparedness Program.

Those hospitals in the CBRN program are expected to be able to handle a contaminated victim and have responsibilities according to RHPP Section 3.4.3 that include:

- Screening for acute exposure.
- Triage of those externally contaminated from the non-contaminated (non-life-threatening scenarios).
- Monitoring for external and internal contamination.
- Conducting external decontamination.
- Reducing internal contamination and treating acute exposure symptoms.

Public health units and municipalities also have health roles under the RHPP. There are hospitals designated for each of the operating nuclear plants in Ontario. For Bruce Nuclear, the designated hospital is Kincardine Hospital and Toronto Western Hospital's Radiation Trauma Unit is designated as the tertiary hospital to treat acute radiation syndrome.

It is not obvious to CELA what numbers of people could be treated at such facilities and whether they would be over-whelmed with more than a few cases. Recall that the PNERP assumes that doses in a nuclear emergency would

be low; thus, the plans appear to contemplate very few radioactively contaminated casualties. It is also not clear that appropriate and sufficient ambulance transport is in place, again, for more than very few radioactively contaminated casualties.

Recommendation #12: Along with upgrading the planning basis to account for much more severe offsite effects, the province and the Kincardine and Bruce plans should increase the numbers of casualties planned for; ensure that the initial response, transport and treatment capacity would be in place for increased numbers, and include those larger numbers in regular testing of the emergency plans.

VII. Instruction of People in Contiguous Zones in Proper Response Techniques

a. Sheltering

Sheltering is one of the measures that might be recommended by authorities. The public should be provided with much more clear communications about when and what types of sheltering could be effective. There is a serious lack of clear information on sheltering in Ontario's emergency plans, including Kincardine's. This is critical because IAEA Guide GS-G-2.1 points out that "typical European and North American homes and their basements may not provide adequate protection". ICRP Publication 109 states that buildings constructed of wood or metal (as opposed to solidly constructed buildings) are "not generally suitable for use as protective shelters against external radiation, and buildings that cannot be made substantially airtight are not effective in protecting against any exposures". The publications state that "substantial" shelter may be found in the halls of "large multi-story buildings or large masonry structures away from walls or windows";

this is for short periods of time of up to a day subject to monitoring. It is critical that emergency planning officials and the public understand that, for example, in large early release scenarios, it may not be possible to prevent all of the exposures to the public from those releases because sheltering will not be fully effective and evacuation takes time. Bruce County's nuclear emergency website does not mention these limitations.[5]

Recommendation #13: The CNSC should request Bruce Power to include in its outreach material to the public, in conjunction with regional emergency response officials, explanations about the capability of sheltering and its limitations as described in the IAEA Guide GS-G-2.1 and to reinforce instructions as to steps to take for rapid and effective evacuation in the case of notification of a significant emergency.

b. Ingestion Control and Monitoring/Decontamination

Ingestion control is a key method to avoid exposing people to radioactive doses, and the distances required for ingestion control are far beyond the primary zone. This means that people must not be eating or drinking radiologically contaminated food, milk, and water. The Provincial plan focuses on the primary zone for milk in the initial stages of a nuclear emergency. It is intended that federal and provincial officials will give advice and directions on ingestion. See Annex E to the Provincial plan for the Protective Action Levels and the Ingestion Control Measures (for example it states Cesium-134 should not exceed 1 kBq/L for water, food, or milk). The zone identified in the Bruce Nuclear Emergency Implementing Plan 2009 as an Ingestion Control Zone is the 50 km Secondary Zone around the plant (section 2.4.3)

By way of comparison to Ontario, the Fukushima Task Force Report indicated that Quebec's Ingestion Control Zone is 70 km. There is no explicit

[5] "Be Prepared for a Nuclear Emergency", http://www.bepreparedgreybrucehuron.com/nuclear/.

ingestion control zone specified in the PNERP. 50 km is Ontario's prescribed secondary zone, but as noted earlier in the discussion regarding evacuation, CELA recommends expanding the secondary zone to 100 km. This would require advance preparation for the provincial and federal authorities to have sufficient monitoring and preparedness in place to be able to give rapid advice on ingestion. While the provincial plan does indicate the Ontario Ministry of Agriculture, Food and Rural Affairs should be in a position to do Province-wide monitoring of foodstuffs, specific arrangements for rapid monitoring within 100 km of the Bruce nuclear plant in case of a nuclear emergency should be established. Doing so by way of a larger default Ingestion Control Zone as in Quebec (but CELA recommends 100 km) may be advisable. In addition, the CNSC should verify that the province has the capability in place to rapidly monitor foodstuffs across the province as suggested in the provincial plan in the case of an accident at the Bruce nuclear site. Westerly winds for example would travel across southwestern and central Ontario agricultural areas and so greater affected distances are conceivable.

Recommendation #14: The default Ingestion Control Zone should be enlarged and extended to 100 km from the Bruce nuclear power plant. CELA recommends that the CNSC should satisfy itself that the province has in place capability to monitor food stuffs province wide in the event of a nuclear emergency at the Bruce plant prior to making a licensing decision on continued operations.

Monitoring plans are not provided in any detail in the Kincardine Emergency Response Plan; it references the Provincial Emergency Operations Centre which would order Routine Monitoring following a "Reportable Event" or Enhanced Monitoring following an "Abnormal Incident". Despite the capitalization of these terms in the plan, they are not defined in the Kincardine

plan. The substance of this section deals with government and agency notification, not with radiation monitoring.

Radiation monitoring is not explicitly outlined in the Kincardine Plan; even if the intent is that this is conducted by the Province, this should be stated. Similarly, although Section 10.3.1 provides that Ingestion Control is the responsibility of the provincial Ministry of Health and Long Term Care and the Grey Bruce Health Unit, the channels for obtaining monitoring information, making decisions, and advising the public are not specified in the Kincardine plan. These responsibilities should be clearly articulated in the Kincardine Plan.

Personal radiation monitoring is provided to some extent under the plans (for example at emergency reception centres). The general advice in the provincial plan is for people who are concerned that they may have been exposed to a radioactive plume to remove and bag their clothing and to shower with soap and water.

VIII. Upgrades to the Levels of Preparedness

In this section of CELA's report we have called for revisions to, and increase of, the Planning Basis around the Bruce plant (and at other Ontario plants) to include preparedness for much more severe offsite effects from a nuclear emergency than the current Ontario planning basis contains. CELA calls on the CNSC to exercise its regulatory jurisdiction in this licensing hearing to thoroughly examine the sufficiency of offsite preparedness at the Bruce nuclear plant. This includes assessment of the sufficiency of the planning basis. Implications of revisions to the planning basis would include:

i) Increase of primary zone. CELA recommends 30 kilometers.

ii) An increased zone for predistribution of KI to 50 kilometers.

iii) A resulting increased primary zone for detailed planning and readiness for evacuations as discussed herein.

iv) Addition of readiness planning to take protective actions such as KI distribution, sheltering, evacuation, radiation monitoring and decontamination and ingestion control by additional institutions such as schools, long term care facilities, recreational facilities and others as detailed in the above discussion of evacuation.

v) Changes to traffic planning and increases to the detail of planning done within 30 kilometers (recommended primary zone) as well as more generalized but sufficiently detailed planning in the secondary zone to ensure that evacuation would be effective.

vi) Location of offsite emergency planning, reporting centres, radiation treatment facilities to be re-visited in light of amended primary and secondary zones.

vii) Increased planning for additional numbers of radioactively contaminated patients both as to immediate response, first aid, triage, transportation, and medical care, and as to longer term care and response capacity on the part of first responders, medical care facilities and hospitals.

vii) Increase of secondary zone. CELA recommends 100 km.

vii) Additional preparedness with respect to offsite monitoring, and ability to give directions for ingestion control. CELA recommends 100 km as the zone within which sufficiently detailed preparations must be undertaken to be able to control ingestion of food, water, crops and livestock potentially affected by a nuclear emergency.

viii) Community engagement. All of the recommendations discussed in this report should be the subject of input from the public and of the community within the recommended primary and secondary zones.

IX. Town of Saugeen Shores

The Town of Saugeen Shores is designated in the Provincial Nuclear Emergency Response Plan as the Host municipality for the Bruce Nuclear plant in the event of a nuclear emergency, meaning that emergency shelters and other supports should be available (the Municipality of Kincardine is designated as the municipality for the primary zone). However, the Town of Saugeen Shores emergency plan does not contain any reference to nuclear hazards nor to its role in supporting the PNERP. The PNERP is included in the glossary of the Plan, but never referenced again in the rest of the Plan. There is a list of Hazards in the Plan, but nuclear is not listed. (See http://www.saugeenshores.ca/en/our-services/resources/community-emergency-plan.pdf).

However, following submission of our report, CELA received a copy of a draft nuclear plan by Saugeen Shores from Bruce Power in response to a request for information. Necessarily, it is incomplete and unpublished to the public. Saugeen Shores should have a finalized nuclear emergency plan in place and publically available as a result of its designation in the PNERP which provides as follows in section 1.8.1:

> ***"1.8 Legislative Requirements in a Nuclear and/or Radiological Emergency- Municipal***
>
> 1.8.1 Municipal Roles & Responsibilities

a. Designated Municipalities - Nuclear

i. Pursuant to section 3(4) of the EMCPA, municipalities have been designated to prepare plans in respect of nuclear emergencies.

ii. Designated municipalities preparing plans in respect of a nuclear emergency include:

- municipalities located within nuclear primary zones
- municipalities acting as a host community

iii. Designated municipalities are listed in **Annex A**.

iv. Appendices 15 & 16 to **Annex I** address the main responsibilities of the designated municipalities."

The PNERP further details the responsibilities of the designated municipalities as follows:

"4.0 Provincial Nuclear Emergency Response Plan (PNERP)

Under the PNERP, certain community facilities, such as centres to assist evacuated persons, are essential for fulfilling the emergency response mandate. These facilities are normally established in large institutions such as community centres, schools or colleges.

4.1 Municipal Roles & Responsibilities

"Designated municipalities" are those in the vicinity of a nuclear facility, which have been designated under the *EMCPA*, and are thus required to have a nuclear emergency response plan (see **section 2.1**above).

The PNERP specifies designated municipal roles and responsibilities that must be addressed in their municipal nuclear emergency plans.

4.1.3 Designated municipalities acting in the capacity of "host municipalities" must provide in their municipal nuclear plans for the reception, care and shelter of people evacuated from their homes. Further, if the nature of the emergency is such that evacuees may have been exposed to a radioactive plume, these municipalities' plans must also include provisions for accommodating the monitoring and decontamination function. Designated municipalities within the primary zones of the nuclear installations may also act in a host municipality capacity either for their own citizens or for citizens of a neighbouring jurisdiction.

4.1.4 "Support municipalities," may be specified by Emergency Order and may be responsible for providing support and assistance to designated municipalities (see PNERP **paragraph 1.8.4**).

4.2 Reception Centres

4.2.1 Municipal nuclear emergency plans should provide for designated facilities that will be used for the reception, care and initial shelter of evacuees.

Because of the nature of the emergency, there may be occasion where monitoring for radioactive contamination and, if necessary, decontamination of evacuees will have to take place. This process may be accomplished in a reception centre that

receives evacuees immediately upon leaving the emergency area or, may be set up separately.

A Reception Centre is the first destination for evacuees. It is organized to perform many of the following functions:

- Registration & Inquiry
- Allocation to Evacuee Centres
- First Aid
- Monitoring & Decontamination (co-location optional)

4.2.4 Host municipalities are expected to resource the Reception Centre facility for the first three functions listed in 4.2.3 above.

4.2.5 The nuclear installation (except in the case of Fermi 2) is responsible for Monitoring and Decontamination, i.e., providing equipment and core staff, training staff, and performing the task (pursuant to federal licensing requirements to provide offsite assistance).

4.2.6 Municipal nuclear emergency plans shall include details regarding the selection, staffing and resourcing of these facilities.

4.3 Evacuee Centres

4.3.1 Evacuee Centres are facilities set up by the designated (host) municipality to provide shelter, food, and other services to people who have been evacuated as a result of a nuclear emergency.

4.3.2 While it is expected that most people will find their own accommodation, lessons learned from major evacuations, including Hurricane Katrina (2005), indicate that 10-20% of the total number of evacuees may require accommodation to be provided to them.

4.3.3 Municipal nuclear emergency plans shall provide details regarding the selection, resourcing and staffing of facilities to be used as Evacuee Centres.

4.4 Emergency Worker Centres

4.4.1 Emergency Worker Centres are facilities set up to monitor and control exposure of emergency workers to radiation.

4.4.2 Emergency workers are defined as persons who are required to remain in or enter offsite areas affected or likely to be affected by radiation from an accident. They include police, firefighters, emergency medical services, personnel from the Canadian Forces, and other essential services.

4.4.3 Designated Municipalities' nuclear emergency plans shall identify facilities for use as Emergency Worker Centres and how they will be managed.

4.4.4 In the event of a nuclear emergency, it is the responsibility of the nuclear operator (except Fermi 2) to set up and staff the monitoring and decontamination component of these centres, pursuant to federal licensing requirements to provide offsite assistance."

The Town of Saugeen Shores does acknowledge on its web site the potential for a nuclear accident and includes basic but appropriate information including the nature of the health risks and advice to listen to the radio regarding potential evacuation instructions. (See http://www.saugeenshores.ca/en/our-services/nuclear-emergencies.asp). However, the Town's role as a host municipality is not mentioned on the website nor in the Town's Emergency Plan.[6] Furthermore, the Sheltering in Place and Evacuation instructions are contained in a section labelled "Community Emergencies", but not repeated in the website section labelled "Nuclear Emergencies". It cannot be assumed that residents will thoroughly search the website to find other applicable sections relating to a nuclear emergency—all necessary information should be gathered together and clearly presented to the public in one place for nuclear emergencies.

It is clear that Saugeen Shores is aware of its responsibilities under the PNERP according to a published report acknowledging a funding agreement with Bruce Power to do so (see http://www.shorelinebeacon.com/2013/07/15/saugeen-shores-updating-their-nuclear-emergency-plan). However, a copy of the plan does not appear to be posted online and therefore not readily available to the public without inquiry.

Recommendation #15: The Town of Saugeen Shores should post its Nuclear Emergency Plan online on its website.

Recommendation #16: The Town of Saugeen Shores website should clearly articulate its hosting role under the PNERP and provide essential information to the public in that regard.

[6] The 2014 Saugeen Shores Nuclear Emergency Plan that CELA was provided by Bruce Power in April 2015 provides that it "is designated as the Reception/Evacuee Emergency Centre (see s. 5.4).

Recommendation #17: All nuclear emergency information relating to Saugeen Shores should be gathered together in one location so that a member of the public looking at the website in a nuclear emergency will see essential information regarding obtaining of updates, advice, sheltering, evacuation, reception centres and other key matters.

X. Summary of recommendations

Recommendation #1: The CNSC should require Bruce Power to demonstrate that the offsite emergency plans in place for Kincardine and the Bruce Plant, taking account of the provincial and federal plans, would mitigate offsite impacts of an INES Level 7 accident at their plant such that those offsite impacts would not result in impacts to the health of persons resident within the primary or secondary zones of the Plant (and subject to the recommendations contained herein as to expansion of those zones).

Recommendation #2: The Ontario nuclear planning basis be established as requiring the plan to demonstrate it is sufficient to respond and prevent human health effects in the case of nuclear emergencies that exceed INES 7. CELA recommends that the CNSC strongly urge Ontario to revise its planning basis accordingly and otherwise to exercise its own jurisdiction to scrutinize the Ontario plans as to their ability to respond and effectively protect the public from the effects of nuclear emergencies that exceed INES 7.

Recommendation #3: The CNSC should require Bruce Power to conduct studies and to work with offsite emergency responders, Kincardine, and the Province of Ontario to ensure that there are realistic evacuation plans in place to respond to a severe accident with early large release, and should insist that these provisions are included in a revised provincial nuclear emergency response plan.

Recommendation #4: KI pills should be pre-distributed to everyone within 50 km of the plant and selectively pre-distributed to vulnerable communities within 100 km.

Recommendation #5: The primary zone should be extended to 30 km. This extension should include consideration of detailed warning systems, initial communications, evacuation, and other protective actions relevant to the primary zone.

Recommendation #6: With the new warning system efforts being undertaken by Bruce Power as outlined by them in Day 1 and described in Section B to this submission, we recommend that the CNSC review and confirm in detail the status of those systems at an annual public meeting of the Commission.

Recommendation #7: Expand the secondary zone to 100 km.

Recommendation #8: The CNSC should direct Bruce Power to work with Kincardine to ensure that detailed and specific information about evacuation routes are provided directly in written form annually to all residents within the primary and secondary zones of the Bruce power plant, as well as made available in other formats including posting to the Kincardine and Bruce Power websites. CELA recommends that this information should be checked annually, and that the Commission should seek specific confirmation as to the manner in which this information is provided annually to the public.

Recommendation #9: The CNSC should direct Bruce Power to work with Kincardine to ensure that detailed, concrete and reciprocal arrangements are made to accommodate students and long term care residents in the case of an evacuation of their institution; and that those arrangements are communicated

publicly and in advance to all parents and families of those students and residents.

Recommendation #10: Kincardine should collect information on the institutions serving vulnerable residents and provide transparent information to the public in brochures or other outreach material and on its website as to the evacuation plans that would be implemented in the case of a nuclear emergency that requires evacuation. Given CELA's recommendation to expand the primary zone to 30 km, this should be done for all such institutions serving vulnerable communities within 30 km of the plant boundaries. Further like information should be gathered for the secondary zone (currently 50 km but recommended to expand to 100 km) so as to be able to expeditiously respond to more severe circumstances.

Recommendation #11: The public should clearly understand what plans are in place to assist them with evacuation from the Primary Zone if they do not have their own transportation. What those plans are should be clearly specified in the Kincardine Nuclear Emergency Plans, and widely communicated to the public in outreach and education.

Recommendation #12: Along with upgrading the planning basis to account for much more severe offsite effects, the province and the Kincardine and Bruce plans should increase the numbers of casualties planned for; ensure that the initial response, transport and treatment capacity would be in place for increased numbers, and include those larger numbers in regular testing of the emergency plans.

Recommendation #13: The CNSC should request Bruce Power to include in its outreach material to the public, in conjunction with regional emergency response officials, explanations about the capability of sheltering and its limitations as described in the IAEA Guide GS-G-2.1 and to reinforce

instructions as to steps to take for rapid and effective evacuation in the case of notification of a significant emergency.

Recommendation #14: The default Ingestion Control Zone should be enlarged and extended to 100 km from the Bruce nuclear power plant. CELA recommends that the CNSC should satisfy itself that the province has in place capability to monitor food stuffs province wide in the event of a nuclear emergency at the Bruce plant prior to making a licensing decision on continued operations.

Recommendation #15: The Town of Saugeen Shores should post its Nuclear Emergency Plan online on its website.

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Recommendation #17: All nuclear emergency information relating to Saugeen Shores should be gathered together in one location so that a member of the public looking at the website in a nuclear emergency will see essential information regarding obtaining of updates, advice, sheltering, evacuation, reception centres and other key matters.

B. Improving Public Emergency Notification and Community Outreach

Over the past several years, Bruce Power (BP) and the Municipality of Kincardine have developed several public alerting and community outreach programs. At present, though it remains incomplete, Kincardine has developed an emergency public notification plan that uses several avenues of public notification and emergency information distribution to reach members of the public within 3 km of the Bruce facility.[7] This notification system is separate from the public notification system for other emergencies.[8] In this system, ten sirens in the 3 km zone will alert the public to tune into radio and televised broadcast media to receiver emergency information.[9] An autodialing system will also call everyone within this radius.[10] This system is backed up by police and firefighters, who will use their sirens, PA systems, and door-to-door notification and information delivery if broadcast media and the other notification systems do not work.[11] The specific details of how some aspects of this work have not yet been completed and released.[12] Whether this will ever happen is also uncertain.[13]

BP is also working on its public notification and outreach programs. Aside from the notifications it is required to give to provincial and municipal emergency response organizations,[14] BP is installing 44 new gamma air monitors within 10 km of its facility and plans to share the data it gathers

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[7] Kincardine Emergency Response Plan ("KERP") (2006), Schedule A to By-Law No. 2006-009; Appendix B, s. 7.1-8.3.
[8] *Ibid*. at s. 3.1-3.3 *and* Appendix B.
[9] *Ibid*. at Appendix B, s. 7.4.2.
[10] *Ibid*.
[11] *Ibid*. at Appendix B, s. 7.4.2 and 8.2-8.3.
[12] *E.g. ibid*. at Appendix B, s. 7.3. Details will be contained in Appendix N, which has not yet been completed. E-mail communication from Roberta Trelford, Kincardine Health and Safety Coordinator, dated February 23, 2015.
[13] In a recently released 2015 draft of the KERP, Appendix N and other appendices have been removed without corresponding new sections detailing the planning it was intended to contain being added anywhere in the general KERP or its nuclear emergency appendix. E-mail communication from Maury Burton, Bruce Power Manager of Nuclear Regulatory Affairs, dated April 1, 2015.
[14] *E.g.* KERP, Appendix B, s. 3.1.

through them with the provincial authorities and CNSC; plans to install particulate monitors are under development. BP has also tested new public notification programs: an AM radio emergency broadcast, a text message alert system with the TELUS network, and BP plans to distribute FM receivers for a special FM emergency broadcast protocol to residents within 10 km of the plant. FM radio and broadcast and cable television will also be required to install equipment for public alerts this spring.[15] Though BP's internal emergency management plan claims more programs exist, at present BP's informational community outreach appears to be limited to a visitors center and summer bus tours.[16]

However, there are some things that BP and Kincardine could or are required to do to continue to increase the safety of residents of the surrounding area. Given the extent to which it appears that new public safety and other measures will continue to be designed and implemented over the next five year period, BP and the CNSC should take several measures to keep the public directly involved as these programs develop. Like the physical safety systems that prevent major incidents in the first place, public notification and response systems should also be multiply redundant yet distinct from each other to maximize the overall chance their of success.

Again, the existing primary and secondary zones are insufficient and should be expanded to 30 km and 100 km respectively. Furthermore, regardless of whether the primary and secondary zones change, BP, Kincardine, and any other relevant municipality should develop public notification and response systems that target people beyond the current legally mandated response areas. The following discussion points should be applied throughout these extended response radii.

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[15] E-mail communication from John Peevers, Manager of Investor and Media Relations for Bruce Power, dated February 25, 2015.

[16] *Compare Bruce Power Nuclear Emergency Response Plan*, BP-PLAN-00001, Steph Murray (2014), s. 4.1.2.4 *with* "Community Relations & Events", Bruce Power, available online: http://www.brucepower.com/community/relationsandevents/.

Many of BP's and Kincardine's emergency notification programs have not been fully developed or implemented. Kincardine and other municipalities take primary responsibility for the development and use of public notification programs during an emergency.[17] As stated, Kincardine has promised in its own emergency response plan that it will provide overlapping and redundant warning systems, including door-to-door notifications by the police if necessary,[18] but Kincardine is still yet to finish and release the final version of its full nuclear emergency response program.[19] Thus what will be done to ensure that all relevant members of the public will be notified in the event of an emergency and the loss of different communications capabilities is not fully known by the public. Further, Kincardine is required to be able to alert "practically 100%" of residents in the contiguous zone within 15 minutes. As its plans stand in the publically available information and the discussion below, this would not appear to be the case.[20] Given the size of plume dispersal in the Chernobyl and Fukushima accidents, the contiguous zone itself is likely too small an immediate response area—a similarly quick response should cover the entire recommended extension of the primary zone.

Also as stated, though BP has tested several new public notification programs that show promise, none of them has been brought to completion. Further, no plans for more testing, implementation, or completion of some of these projects has been released.[21] Without bringing these programs to completion, the public does not ultimately benefit from them even if it feels reassured by their discussion in these licensing proceedings. Absent concrete

[17] Province of Ontario Emergency Response Plan (2008), s. 1.6, 3.1.
[18] *See* KERP, s. 3.3.1, 3.3.6. *See also* KERP Appendix B, s. 7.1, 7.4.1. The missing portion is Appendix N of the plan, which will contain the final details of how public notification in the event of a nuclear emergency will work.
[19] E-mail communication from Roberta Trelford, Kincardine Health and Safety Coordinator, dated February 23, 2015.
[20] *Provincial Nuclear Emergency Response Plan, Implementing Plan for Bruce Power*, Emergency Management Ontario (2009), available online: https://www.ceaa-acee.gc.ca/050/documents/56400/56400E.pdf.
[21] E-mail communication from John Peevers, Manager of Investor and Media Relations for Bruce Power, dated February 25, 2015.

and binding promises to fully implement these programs on an appropriate timeline, the public cannot know whether it will actually be assisted and protected by them when it assumes the risk of an extended-life reactor.

Since these communication programs are under active development, they can and should be expanded to include certain things if they do not already. CELA's mandate includes advocacy for the rights and interests of low-income Ontarians and other vulnerable populations. Some people will not be able to use certain communications media because of their location, status, or physical disability. For instance, people who are hearing-impaired will not be able to make use of the proposed FM receiver and radio broadcast systems. Canada's literacy rate is high, but not everyone can read written evacuation materials. Televised broadcasts only work for those people who are watching at the time of the broadcast or can hear alert sirens. A further challenge to the Kincardine area is that many people live in remote areas. Some people do not have cellphones, or have cellphones but not landlines. Also, cellphone service can be lost or obstructed depending upon an individual's location. Further, like any communication/broadcast technology, phones require the recipients to be present and able to use them; they also need to be powered up. Any auditory communication will also need to account for non-English speakers. Homeless people are particularly vulnerable as they do not have ready access to most things.[22]

As it exists, Kincardine's response plan does fill in some of these gaps, though it is at present incomplete.[23] The finished portions of Kincardine's existing plan do state that police and fire fighters will conduct door-to-door notifications,[24] and this could protect the vulnerable people described above if done properly. BP and Kincardine must consult the public and fill in these gaps

[22] County of Bruce, *Bruce County Long Term Housing Strategy Update: 2013-2023*, p. 7, available online: http://www.brucecounty.on.ca/assets/files/Bruce%20County%20Long%20Term%20Housing%20Strategy%202013.pdf. Gives known rate of homelessness in Bruce County.
[23] See Note 6.
[24] KERP Appendix B, s. 7.4.1.

to ensure that the community is fully protected in the event of an emergency. CELA has been unable to determine whether BP and Kincardine have the following, but CELA recommends these measures if they have not already been put into place. For instance, they could maintain a list of those people, e.g. deaf people, who would not be reachable through all of the proposed notification media that BP and Kincardine otherwise use (e.g. call lists) and so for whom door-to-door notifiers would be immediately dispatched. Other emergency personnel could be immediately dispatched to evacuate homeless people and others who are not covered by existing notification systems.

Additionally, most of BP's current projects are communications media that are used only once an emergency is underway.[25] BP appears to be only taking limited steps to ensure that the public is aware of how an emergency response will work in advance.[26] Ensuring that a community has advanced knowledge of how to deal with a nuclear emergency still yields better results.[27] Taking steps to ensure that the public continues to be aware of emergency response measures and what they are expected to do as months and years go by is challenging, since essentially any measure requires some measure of voluntary participation and motivation. However, as it is doing with communications media for use during an emergency, BP could create multiple redundant outreach systems to maximize message saturation. Radio and television broadcasts, community presentations, call lists, and similar endeavours can all be used as parts of a single, comprehensive program to reach as many people as possible. This program will have to be redone periodically to ensure that members of the public remember the information that it presents. Since a certain and meaningful proportion of the community will most likely still not have the knowledge that they need, this program will

[25] E-mail communication from John Peevers, Manager of Investor and Media Relations for Bruce Power, dated February 25, 2015.
[26] *See e.g.* "Community Relations & Events", Bruce Power, available online: http://www.brucepower.com/community/relationsandevents/.
[27] IAEA Publication, "Lessons Learned from the Response to Radiation Emergencies (1945-2010)", IAEA, August 2012.

be backed up with the different programs that BP is already working on to disseminate information during an emergency to ensure that ultimately everyone is protected. Currently, the counties of Grey, Bruce, and Huron maintain a website with some information on emergency response, including information about KI pills, but otherwise very limited information is available on it beyond admonishments to listen to the radio if necessary.[28] Its content should be significantly expanded to more fully account for the above concerns.

Recommendation #18: As a licensing condition, Bruce Power should be required to fully implement the public notification programs that are currently in their testing phase.

Recommendation #19: As a licensing condition, Bruce Power should be required to conduct several ongoing public outreach programs, including but not necessarily limited to town meetings and presentations, call lists, door-to-door distribution of informational materials, and maintaining a website with all relevant emergency response information on it. These efforts should happen on a regular schedule and repeat themselves at least once annually.

Recommendation #20: Bruce Power and Kincardine should work together to maintain lists of people who will need special accommodations for emergency notification and evacuation.

Recommendation #21: Since it has been at least nine years in the making and still unreleased, the CNSC should set a firm timeline for Kincardine to complete Appendix N, "Emergency Procedures", and thereby its nuclear emergency response plan.

[28] "Be Prepared. Grey Bruce Huron.", available online: http://www.bepreparedgreybrucehuron.com/.

C. Overdelegation to Bruce Power and Other Weaknesses in the CNSC Regulations

I. Overview and Context of the Problem

Under the current CNSC regulatory regime and the proposed licensing conditions, the CNSC delegates most of the responsibility for creating, implementing, and reviewing accident management and emergency response plans to Bruce Power, Inc. ("BP"). This delegation of much of each stage of the emergency plan creation process to the regulated entity itself creates a system that is out of line with the basic principles of administrative and regulatory governance. These principles and the administrative system that they support exist to ensure that well-reasoned regulations and programs that best protect the public interest will be created.[29] A program that fails to follow them greatly increases the risk that the public will not be sufficiently protected from the problems the system is designed to mitigate. This is particularly true in the context of electricity regulation, wherein various deregulation and delegation measures over the past twenty years have universally failed to deliver on pro-public promises.[30] To fix this problem, the CNSC should take several measures to strengthen its current accident management and emergency preparedness regulations. These measures include new regulations that contain concrete emergency preparedness requirements and various measures for greater involvement in the planning process by the CNSC.

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[29] *From New Expert Administration to Accountability Network: A New Paradigm for Comparative Administrative Law*, Francesca Bignami, George Washington University Law School Faculty Publications, 2011, pp. 6-7, available online: http://scholarship.law.gwu.edu/cgi/viewcontent.cgi?article=1251&context=faculty_publications.

[30] *Deregulation & Privatization: Texas Electric Power Market Evidence*, Eric L. Prentis, Review of Business and Finance Studies Vol. 5 No. 2, pp. 117-126, 2014, available online: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2459705.

Under the consensus principles of administrative law in Ontario and Canada, an administrative body and its decision making should be among other things independent, transparent, equal, and consistent.[31] There are several ways in which the CNSC's existing system does not conform to these principles. This results in a system that is vague and unpredictable. Many provisions within the CNSC's emergency planning and accident management regulations fail to set definite standards by which an accident/emergency plan could be judged adequate by the CNSC.[32] Further, many explicitly delegate most data gathering, analysis, and testing functions to licensees.[33] Not only is the CNSC's only substantial function in this complex system a pre-licensing review, it is nearly impossible to discern what would make a plan pass or fail the CNSC's licensing review.[34] Further, the extensive delegation of management and planning responsibilities ultimately heavily favours the input from and interests of BP over those of the public.[35]

Being a private and for-profit business,[36] by its nature BP has self-interests that compete with those of the public in its decision making. This is fundamentally true of all major industries, and that is why they are regulated by independent administrative bodies instead of being left to govern their own behaviour.[37] Administrative entities provide objective rulemaking in fields that require too much technical expertise for effective Parliamentary oversight on behalf of the public. Proper regulation under auspices of government is intended to have the ability to require operators to adopt and implement

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[31] *Compare Principles of Administrative Justice*, Council of Canadian Administrative Tribunals, available online: https://www.ccat-ctac.org/en/pdfs/about/principles.pdf *with Principles of Administrative Justice*, Society of Ontario Adjudicators and Regulators, available online: https://soar.on.ca/document-library/publications/98-principles-of-administrative-justice.
[32] *See* Sections II. a., b., below.
[33] *See* Section II. b., below.
[34] *See* Sections II. a., b., below.
[35] *See* Section II. b., below.
[36] *E.g. Power Workers' Union Increases Ownership in Bruce Power*, Bruce Power, available online: http://www.brucepower.com/8932/news/power-workers-union-increases-ownership-in-bruce-power/ *and Our Profile*, Borealis Infrastructure, http://www.borealis.ca/about-us/our-profile.
[37] Bignami, *supra* note 1, at pp. 6-7, 30.

stronger measures to protect other interests, notably those of employees and the public.[38] Because the current Canadian nuclear accident and emergency management regulatory approach leaves many substantive decisions and review processes in the hands of BP, the public interest may not be factored as strongly into the emergency management system creation process as it should be. In CELA`s submission, it is unnecessary and inappropriate for the CNSC to delegate so many data gathering, analysis, and planning functions to BP.

The recent Fukushima Daiichi accident in Japan demonstrates this tendency in action when a regulator has left too much authority to the regulated entity. The Tokyo Electric Power Company, or Tepco, was and is the Japanese utility that oversees the Fukushima plant.[39] In theory, Tepco was heavily regulated like any utility monopoly would be. However, in practice, Tepco's regulators heavily relied on it for information and advice and left much of the company's safety oversight to the company's internal processes.[40] The result was poor emergency preparedness and response on Tepco's part, including the very late release of important information and accusations that Tepco hid information.[41] Before a major incident, a for-profit entity, especially one that has very limited disaster liability as licensees do in Canada,[42] may have significant incentive to minimize emergency preparedness expenditures. After a major incident, a company that stands to lose money

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[38] *Ibid.*

[39] *E.g. Inept and Ill-Prepared: A Closer Look at the Fukushima Report*, Jake Adelstein, The Wire, 5 July 2012, available online: http://www.thewire.com/global/2012/07/inept-and-ill-prepared-closer-look-fukushima-report/54229/.

[40] *Ibid.*

[41] *Ibid. See also Tepco Took Months to Release Record Strontium Readings at Fukushima*, Mari Saito, Reuters, 13 February 2014, available online: http://www.reuters.com/article/2014/02/13/us-japan-nuclear-fukushima-strontium-idUSBREA1C09720140213.

[42] *Nuclear Liability Act*¸ RSC 1985, c. N-28, s. 31. *See also* House Government Bill C-22, *Energy Safety and Security* Act, *enacting the Nuclear Liability and Compensation Act*, s. 24(1), available online: http://www.parl.gc.ca/HousePublications/Publication.aspx?Language= E&Mode= 1&DocId=7861410&File=215#7. This will repeal the *NLA* and over approximately the next four years raise nuclear operator liability to $1 billion.

and public confidence may have additional incentives to downplay and hide information about the disaster's magnitude.

In CELA`s submission, the great extent to which the CNSC relies on regulated entities to provide data, analysis, planning, and review in lieu of itself is inappropriate and unsafe for the public. The remainder of this section will examine the most problematic examples of over-delegation and ambiguous regulatory standards in the CNSC's Reg. Docs 2.3.2[43] and 2.10.1,[44] which govern accident management and emergency preparedness respectively, and offer recommendations for how best to improve these issues. While other regulations and standards will be referenced from time to time as they are relevant, these two regulations will be this section's focus. Each subsection will discuss a specific aspect of the general problems of over-delegation and regulatory weakness. At the end of each will be suggestions that CELA submits would help the CNSC to build a more safe and effective regulatory framework.

II. Specific Delegations and Ambiguity in Reg. Docs 2.3.2 and 2.10.1, Licensing Conditions, and the *Licensing Conditions Handbook*

While the principles-based approach of Canada's regulatory system is designed to leave some discretion to regulators based on their technical expertise and to leave flexibility within the system to allow it to adapt to and account for new technologies in complex fields,[45] the CNSC's current accident management and emergency planning regulatory scheme is so overly reliant on guidance principles and delegation to regulated entities that it is very difficult for an observer to tell what is sufficient under the regulations. Both Reg. Docs

[43] Reg. Doc 2.3.2, available online: http://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/Reg. Doc2-3-2/index.cfm.
[44] Reg. Doc 2.10.1, available online: http://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/Reg. Doc2-10-1/index.cfm.
[45] *E.g. New Governance, Compliance, and Principles-Based Securities Regulation*, Christie L. Ford, American Business Law Journal Vol. 45 Issue 1, Spring 2008, pp. 6-9, available online: http://wwwarc.law.ubc.ca/files/pdf/faculty/ford/ABLJ_50.PDF.

("RDs") 2.3.2 and 2.10.1 consist mostly of guidance, rather than mandatory or proscriptive provisions. The few mandatory/prescriptive provisions of each of these regulations generally only require the license applicant, in this case BP, to address several heads of concern, but offer nearly no concrete provisions for how they should be addressed or what would constitute sufficient planning and analysis under them.[46] While the guidance sections of these regulations give license applicants and the general public some insight into what the CNSC would like to see in an application, the use of non-binding language (e.g. "should" or "may" vs. "shall" or "must") in these sections makes it impossible to discern what the CNSC would consider to be sufficient addressing of a head of concern by a license applicant or whether different heads of concern need to actually be addressed at all for a license applicant to pass.[47]

Further, Licensing Conditions and their supporting *Licensing Conditions Handbook* are intended to fill in some of these gaps. However, the current proposed licensing conditions often do little to elaborate on the loose requirements in the regulations.[48]

Aside from making the content of a license application assessment by the CNSC unclear to the public, this seems unnecessary in the context of nuclear energy. Nuclear energy is a highly technical, well-documented field wherein nuclear nations are very collaborative on safety matters.[49] Also, Ontario only has three major operational commercial nuclear power facilities, including the Bruce facility, and each of these facilities has been in operating for decades with a widely used and thus presumably well-documented reactor technology (CANDU).[50] Because of this, continued regulation and licensing of these facilities, including Bruce, are amenable to definite regulation. The CNSC does

[46] Sections II.a., II.b., below.
[47] *Ibid*.
[48] Section II.a.
[49] *E.g. Coordinated Research Activities: About Us*, International Atomic Energy Association, available online: http://cra.iaea.org/cra/about-us.html.
[50] *Nuclear Power*, Ontario Power Generation, available online: http://www.opg.com/generating-power/nuclear/Pages/nuclear.aspx *and About Us*, Bruce Power, available online: http://www.brucepower.com/about-us/.

not need to rely so heavily on generic, technology-neutral regulations as it does for relicensing applications. Further, as will be discussed below, the CNSC often incorporates CSA technical standards into its license conditions.[51] However these are difficult for the public to access and not amenable to the usual democratic regulation making process. Incorporating more exact technical standards into the regulatory process itself is both helpful to the public and feasible. Finally, because of the unusual risk that nuclear accidents pose to the public, high levels of administrative discretion and ambiguity that may be appropriate in other administrative fields are not appropriate in nuclear energy. The public should be fully aware of how it is protected so that it can request and receive changes that it feels are best for it. Taking steps such as will be detailed below, will increase the clarity/transparency of the process, while shifting the balance of power away from licensees and more towards the public regulator.

a. Overreliance on "Guidance" Rather than Binding Regulations

The chief difficulty with all of the CNSC regulations as they are written is that they contain almost no legally binding requirements. As will be discussed in greater detail in Section c. below, the provisions in RDs 2.3.2 and 2.10.1 that contain mandatory language are almost always so vague as to make it unclear what constitutes sufficient emergency planning. However, most of the specific, substantive provisions of each Section of the regulations are contained in their "Guidance" sections. Not only are these provisions in "Guidance", they are universally constructed with non-binding words like "should" and "may". While the aim of this appears to be keeping the regulations flexible and technology-neutral, the non-binding nature of most of the regulations' substantive provisions prevents a public observer from knowing what would

[51] For a list of available CSA nuclear safety standards, see the nuclear page in the CSA document shop, available online: http://shop.csa.ca/en/canada/energy/nuclear/icat/nuclear.

constitute a passing or failing application. This also allows licensees either to avoid the more specific requirements or to provide cursory analyses and planning under them that would not be legally sufficient for a more specific and mandatory regulation. To the extent that technical standards, such as those made by the CSA, are incorporated into regulations (e.g. N1600 for RD 2.10.1), the extensive compartmentalisation of major aspects of planning in Guidance sections makes it unclear which aspects of these standards are actually mandatory.[52]

In theory, License Conditions, the *Licensing Conditions Handbook* ("*LCH*"), and the incorporation of CSA standards are designed to compensate for this ambiguity. However, each of them is often as indefinite and non-binding. The proposed License's section on emergency planning is a single sentence that only directs the licensee to create such a plan and otherwise offers no guidance on how to do so, what it will contain, and what safety/planning standards it must meet to comply with the CNSC's system.[53] The proposed *LCH* does offer more concrete guidance for fire protection by subjecting the licensee to the standards of the CSA's N293-12[54] (though this standard is already mandatory under CNSC regulations),[55] but the other emergency planning conditions (contained in Section 10.1 – Compliance Verification Criteria) are subject to the same concerns as the regulations.[56] Aside from directing BP to conduct gap analyses in paragraph five of this section (itself an oversight problem, see below),[57] the conditions rely on the same problematic model of directing BP to address several issues without giving any minimum requirements or substantive directions on how to do so (see paragraph six, Addressing Business Continuity, for example). Section 10.1 also uses a Guidance

[52] *E.g. Regulatory Documents*, Canadian Nuclear Safety Commission, s. 2.10, available online: http://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/index.cfm#R18.
[53] PROL 18.00/2020, p. 4, s. 10.
[54] PROL 18.00/2019, pp. 75-76, s. 10.2.
[55] *Regulatory Documents*, Canadian Nuclear Safety Commission, s. 2.10, available online: http://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/index.cfm#R18.
[56] *Ibid*. at, pp. 72-74, s. 10.1.
[57] *Ibid*. at p. 73.

section, rather than issuing specific and binding directions.[58] CSA Standard N1600 provides a far more detailed list of considerations and occasionally a direct standard, but for the most part suffers from these same problems.[59]

LCH Section 3, "Operating Performance", which covers accident management, suffers from similar concerns. Several technical documents are referenced throughout the section, including technical documents about managing severe accidents in a CANDU reactor facility.[60] However, many of them are Guides/Guidelines.[61] Further, the Condition mentions another technical CSA standard (N290.11), but leaves this mention in the "Recommendations and Guidance" Section, stating that BP "should" adhere to it, but not mandating such.[62] Again, this leaves the licensee free to implement lesser standards and leaves the public unsure of what will actually happen under the CNSC's regulations and orders.

This concern applies to literally every Section of RDs 2.3.2 and 2.10.1. Each contains a few mandatory provisions, followed by a lengthier section of "Guidance". Within this consistent regulatory ethic are a few notable examples. In RD 2.3.2, the last four sections of the regulation, or 74% of its substantive pages, are strictly guidance.[63] The bulk of RD 2.10.1 Sections 2.2.5 and 2.2.6[64] (emergency personnel, facilities, and equipment), including both of their most specific provisions, are also contained in Guidance sections. Section 2.2.3 leaves five heads of analysis to its guidance section.[65] One of RD 2.10.1's main problems is that it leaves its instructions to consider a "full range of postulated scenarios", including several enumerated natural disasters, and to provide information to outside authorities based on its analysis of these things

[58] *Ibid*. at p. 74.
[59] *N1600-14: General Requirements for Nuclear Emergency Management Programs*, CSA Group.
[60] *Ibid*. at pp. 30-34, s. 3.1.
[61] *E.g. ibid*. at p. 33, points 1 and 3
[62] *Ibid*. at p. 34.
[63] Reg. Doc 2.3.2, ss. 4-7, available online: http://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/Reg. Doc2-3-2/index.cfm.
[64] Reg. Doc 2.10.1, ss. 2.2.5 and 2.2.6, available online: http://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/Reg. Doc2-10-1/index.cfm.
[65] *Ibid*. at s. 2.2.3.

in the Guidance section of Section 2.1, rather than making it mandatory.[66] The mandatory aspect of this section is similar, but more narrow and yet less specific. This leaves room for licensees to avoid considering and making concrete preparations for some of the major natural disaster events that should be definitively addressed by the CNSC in its regulatory requirements.

Finally, to the extent that these regulations are supplemented by other CNSC regulations and mandatory CNSC standards, the other regulations and the CSA standards often fail to provide pointed requirements themselves. As discussed above, the CSA's key emergency planning document, N1600-14, also relies on a general, principles-based approach, rather than offering specific technical guidance.[67] Further, as will be discussed in greater detail in Section II.d. below, the regulations leave some information disclosure decisions in the hands of licensees.[68] BP is subject to RD/GD-99.3,[69] the CNSC's public disclosure regulation. However, much of this document also only enumerates general heads of concern for a licensee to address, rather than specifying mandatory information releases.[70] The same is true even of Reg. Docs 2.4.1[71] and 2.4.2,[72] which are actually intended to explain how to conduct analysis methods referenced in RDs 2.3.2[73] and 2.10.1.[74] While they do reference a CSA standard that offers some more concrete guidance on how to conduct the analysis (N286.7),[75] once again these regulations mostly only tell licensees

[66] *Ibid.* at s. 2.1.
[67] *N1600-14: General Requirements for Nuclear Emergency Management Programs*, CSA Group.
[68] Section II.d.
[69] RD/GD-99.3, http://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/rdgd993/index.cfm.
[70] *See generally ibid.*
[71] Reg. Doc 2.4.1, http://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/regdoc2-4-1/index.cfm.
[72] Reg. Doc 2.4.2, http://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/regdoc2-4-2/index.cfm.
[73] Reg. Doc 2.3.2.
[74] Reg. Doc 2.10.1.
[75] *N286.7: Quality Assurance of Analytical, Scientific and Design Computer Programs for Nuclear Power Plants*, CSA Group.

some things to address without much pointed direction on how to do so and rely heavily on guidance sections.[76]

Recommendation #22: The provisions contained in the "Guidance" sections of Reg. Docs 2.3.2 and 2.10.1 should be made mandatory and as such should be rewritten with binding language (e.g. "will" and "must" vs. "should" and "may").

Recommendation #23: The CNSC's assorted regulations and the Conditions contained in the proposed License and Licence Conditions Handbook (*LCH)* (since it is unlikely that new regulations will be made in time for an official decision on the BP license) should be expanded to contain specific provisions making what will be sufficient consideration or planning for different disasters clear. This must include engineering and scientific standards that make what will be sufficient evidence of a claim about the nature of a potential situation and the sufficiency of a proposed solution to it clear.

Recommendation #24: Since CSA standards, like N1600-14,[77] do not always themselves offer technical standards, the CNSC should conduct its own studies to create and implement them where they are currently absent. The regulations should be updated accordingly.

Recommendation #25: Any private standards incorporated into regulations or a licensing decision should be made readily publicly accessible as well. Doing this would greatly enhance regulatory clarity, predictability, and consistency for the public.

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[76] *E.g. N1600-14: General Requirements for Nuclear Emergency Management Programs*, CSA Group.
[77] *N1600-14: General Requirements for Nuclear Emergency Management Programs*, CSA Group.

Recommendation #26: As it creates new and specific technical standards, the CNSC should publish all of the studies it conducts to develop and implement them in an accessible, user-friendly index on its website so that the public and outside experts can easily find and review them. To the extent that publishing them in both of Canada's official languages is a problem, the CNSC should hire additional translation staff. Using this as a reason to avoid publication goes against the purposes of having both official languages and is not a valid reason for withholding important public information.

b. Overdelegation

CELA's primary concern with the regulations and licensing conditions as they stand is the sheer volume of authority and program oversight that they leave in the hands of regulated entities. This is much more than just a case of leaving the finer details of a program's design to the entity that must shape its program to its staff and facility structures. Not only is each stage of the program's design and implementation left in the hands of licensees, the program's testing and assessment (including the development of testing methodologies) are also left up to the licensees. Throughout this process, the CNSC essentially only provides a review function without any standards for such review given in the CNSC's regulations.[78] Overall, this creates a system in which nuclear power utilities are effectively self-regulating. Especially in the case of privately-owned BP, this compromises the independence of the nuclear regulatory system by leaving most substantive decisions and oversight in the hands of an entity with significant self-interests that run contrary to those of the general public. It also compromises the transparent nature of the system by leaving much of the underlying data generation and analysis to an entity

[78] *Cf. e.g.* Reg. Doc 2.10.1, ss. 1.1, 1.2 (discussing regulations in the context of licensing application process, wherein a license applicant produces application materials based on the regulation which the CNSC will review before making a decision).

that is not subject to *FIPPA*,[79] preventing public review of its reasoning for making different emergency response and testing decisions.

Each subsection of Section 3 of RD 2.3.2 ("Requirements for an Integrated Accident Management Program") leaves the development of much of the substantive contents of each aspect of the licensee's accident management program to the licensee. Each paragraph specifies something that the licensee must address, but offers neither a methodology for determining which problems to address under each general requirement nor a system for addressing any issues that have been identified. Paragraph 4 of Section 3.2 offers an instructive example: "identify and document challenges to safety functions and physical barriers and perform safety analysis". Most of the other requirement paragraphs throughout Section 3 contain similarly worded and structured mandates.[80] Thus, the regulations delegate responsibility to the licensee to determine the methodology for determining what is a sufficient threat to merit analysis, the methodology for determining what is a sufficiently effective response to whatever concerns the licensee feels merits response, and based on the results of this methodology what response measures will actually be implemented. Because of the non-public nature of this licensee, the scientific analysis and decision making methods that BP will use in making these decisions will not be fully if at all available to the public. To the extent that the CNSC relies on Conditions in the *LCH* that reference outside documents, like the generic CANDU Severe Accident Management Technical Basis Documents,[81] they should be explicitly referenced in the regulations to add clarity and certainty to their outcomes and to ensure that well-tested standards that ensure public security are a part of any plan implemented by the licensee. Without such an inclusion, even if it is the customary practice of the CNSC to include standards like these in licenses, the public is not

[79] *Freedom of Information and Protection of Privacy Act*, RSO 1990, c. F.31, ss. 2(1), 10(1) (definition of institution and applicability of *FIPPA*).
[80] Reg. Doc 2.3.2, s. 3.
[81] PROL 18.00/2019, p. 33, s. 3.1.

guaranteed by the law to have these protections because it would then be legally permissible for them to be omitted in a future license.

RD 2.10.1 has the same problem. Section 2.2 of this regulation contains most of its substantive provisions, and several of them leave the development of different aspects of emergency response to the licensee. Making this worse, the *LCH* delegates the "gap analysis", which is designed to find and fill holes in the regulations, to the licensee.[82] Some of these delegations appear to be supplemented by other CNSC regulations and/or CSA standards.[83] However, these regulations still leave several aspects of emergency planning almost entirely to the discretion of licensees. The requirements of Sections 2.2.2 and 2.2.3 for instance are somewhat structured by N1600[84] and Emergency Management Ontario (EMO) and the *Provincial Nuclear Emergency Response Plan* (*PNERP*), but significant discretion is still left to licensees.[85] The EMO sets general incident classification standards, but the technical analytical processes underlying the classification of events based on their likely consequences, i.e. the substantive decision making process, is left to be developed by the licensees.[86] Leaving such extensive discretion in the hands of the regulated entity may be less likely to produce a favourable outcome than clear, imposed regulatory standards.

Section 2.2.8 entirely delegates the creation of a plan to transition from emergency response to recovery to licensees. The mandatory section of the regulation does little more than to simply direct licensees to create such a plan. Contents are barely described in the non-binding guidance section.[87]

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[82] PROL 18.00/2019, p. 33, s. 3.1 and p. 73, s. 10.1.
[83] Reg. Doc 2.10.1, s. 2.2.5 (Emergency Personnel Protection); *Regulatory Documents*, Canadian Nuclear Safety Commission, s. 2.8, available online: http://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/index.cfm#R15.
[84] *N1600-14: General Requirements for Nuclear Emergency Management Programs*, CSA Group.
[85] Reg. Doc 2.10.1, ss. 2.2.2 and 2.2.3; Province of Ontario, Emergency Management Ontario, Ministry of Community Safety and Correctional Services, *Provincial Nuclear Emergency Response Plan (PNERP)*, 2009, ss..3, 6.2, 6.3.
[86] Reg. Doc 2.10.1, ss. 2.2.2 and 2.2.3.
[87] Reg. Doc 2.10.1, s. 2.2.8.

Section 2.2.6 illustrates another clarity/predictability challenge from a public observer's perspective: the extent to which binding regulatory requirements will be enforced. The CNSC has already waived the onsite response facility requirement of Section 2.2.6 in the proposed Licensing Conditions.[88] Section 2.2.6 contains no provisions that make building an onsite response facility (at least of some kind) discretionary, nor does it contain any provisions that would allow the CNSC to waive such a requirement.[89]

Very importantly, RD 2.10.1 also leaves validation and testing of the emergency response programs that the licensee created to the licensee itself, making licensees substantially self-governing. Section 2.2.9 requires licensees to validate the own plans and procedures and to demonstrate that they actually work.[90] Since no method for making such a demonstration is prescribed, it appears that the licensee will develop its own testing methods in addition to producing its own data with them. The same is true of Sections 2.3.1 and 2.3.3. In 2.3.1, licensees are directed not only to design the emergency exercises which will test the capabilities of their response systems, but to train and set up certification schedules for emergency response personnel working for outside organizations.[91] Section 2.3.3 directs licensees to execute the planned tests themselves. Once again, the objectives and testing structure are developed by the licensees and analyzed in a "self-assessment report" rather than directly by the CNSC itself.[92] These regulations introduce a possibility of bias into the emergency management system, since the companies and employees designing and testing their systems may want them to succeed at minimal cost. Whether it is conscious or not, this will have a tendency to produce distorted data through less rigid testing parameters and

[88] PROL 18.00/2019, p. 73, s. 10.1; NK21-CORR-00531-11715/NK29-CORR-00531-12105, available online: http://www.brucepower.com/wp-content/uploads/2013/11/NK21-11715_NK29-12105.pdf.
[89] Reg. Doc 2.10.1, s. 2.2.6.
[90] *Ibid*. at 2.2.9.
[91] *Ibid*. at 2.3.1
[92] *Ibid*. at 2.3.3.

more generous post-testing data analysis. Certainly, it will allow for the possibility of such bias. Even if the CNSC has full faith that licensees will not take advantage of these opportunities, the possibility should be definitively foreclosed. Further, leaving such a large portion of the methodology development and data analysis in the hands of a private company will cut the public out of much of the process, making it more difficult for the public to know how/if it is being protected and to have a voice in the matter.

Recommendation #27: The CNSC should revise Reg. Docs 2.3.1. and 2.10.1 and add Conditions to the License and *Licensing Conditions Handbook (LCH)* so that the CNSC will be solely responsible for the development and implementation of testing methodologies and scenarios that examine whether existing emergency response/management systems actually work. The CNSC should also develop its own data analysis methodologies and testing pass/fail standards and publish them so that the public is aware of what exactly adequate emergency response will be and to eliminate the potential for pro-licensee bias in the system. This will both improve the system's transparency and give the public a more appropriate level of input in these processes.

Recommendation #28: The CNSC should conduct its own gap analysis to determine what aspects of nuclear safety and emergency management are not covered by existing regulations and safety/emergency response plans. Ensuring that all safety concerns are addressed is the job of a regulator, not a licensee. Based on this, the CNSC should add further conditions to the Bruce Power License and begin to develop further accident management and safety regulations that will address any issue that the existing regulations do not.

c. Seemingly Definite Legal Standards and the Principle of Consistency

Both Reg. Doc 2.10.1 and 2.3.2 frequently use terms that sound like concrete legal standards, but actually give applicants and the public little legal or practical guidance as to what the content of accident/emergency plans will be. This is contrary to the basic principles of administrative governance and the rule of law for several reasons. Ambiguous standards make administrative outcomes unpredictable and subject to arbitrary, contradictory decisions. The public and its interests are best served when the public knows about what outcomes it should expect from existing rules so that it is free to either agree with them or to change the rules if it does not. The following are the ways in which these regulations and license conditions fail to provide definite standards through which consistent, predictable decisions can be made.

Some instances of seemingly definite but ultimately ambiguous terms are fairly straightforward. In section 2.1 of RD 2.10.1, applicants are instructed to consider all events that would have an "unacceptable" impact on their facilities in their emergency planning basis. However, what is and is not "unacceptable" is never defined, and confers discretion to decide what is and is not upon the licensee. It is not possible to tell ultimately what will be considered and accounted for. Further, as is discussed in more detail above,[93] it relies on the licensee's own study, which is likely to set a higher acceptability threshold than an independent regulator would in order to avoid additional preparation costs. For instance, would any physical damage or release of radiation be "unacceptable", or would some smaller releases by "acceptable"? How small? Further, applicants are only instructed to "consider" these events in their planning basis — with no instruction as to what measures, if any, must be implemented to prevent or manage these situations are given.[94] A member of the public reading this document could not tell.

[93] Section II.b.
[94] Reg. Doc 2.10.1, s. 2.1.

Each assessor working for any of Ontario's nuclear facilities or one of the companies that owns them could reasonably come to a different conclusion, resulting in inconsistent licensing decisions and applications of this rule by the CNSC.

Some instances of ambiguous standards are more holistic and on their faces appear to be defined by the specific regulatory provisions that follow them. However, most of the provisions in 2.10.1 and 2.3.2 are so pervasively vague or dependent on "Guidance" (which is by definition non-binding) that what would actually be required of an applicant to meet the standard is either unknowable or subject to too many reasonably possible interpretations for either the CNSC or its regulated entities to provide consistent decisions. Section 1.3 of RD 2.10.1 is one of the better examples of this. Its first paragraph uses definite, binding language ("must", "cannot") to "prevent the escalation" and "mitigate the consequences" of accidents.[95] There is latent ambiguity in these phrases, and the regulations under them do not resolve it. For instance, how absolute is the word "prevention"? It could be interpreted to mean a range of things, from preventing all escalation immediately after an event has occurred to preventing continued escalation several hours or days after a major incident. No definite standards for what constitutes adequate prevention for licensing or fining purposes are ever enumerated. Much of the binding language throughout these regulations is undermined in this manner, usually to the point of failing to actually impose definite, binding standards consistently across several licensing applications.

Section 2 of RD 2.3.2 provides further example of this. Paragraph 7 of this section requires applicants to be able to respond to any "credible" accident for the same reasons as Section 1.3 of RD 2.10.1.[96] This is a particularly problematic standard in the context of nuclear licensing because much of the conflict between nuclear licensees (e.g. OPG), the CNSC, and NGOs like CELA

[95] Reg. Doc 2.10.1, s. 1.3.
[96] Reg. Doc 2.3.2, s. 2.

over the past several years has surrounded which low probability events need to be considered and planned for by a licensee.[97] While definite probability standards have been used in some instances, this regulation specifies none.[98] This leaves applicants free to choose a higher probability standard than the public may want or may be prudent by characterizing the catastrophic results of events like the Fukushima incident as ``low probability`` (despite the fact that they have actually occurred), thus allowing them to avoid costly advance preparation for such events. Once again, leaving a wide margin for interpretation will result in inconsistent regulatory outcomes in an industry in which inadequate preparation can have severe consequences for the public.

Recommendation #29: The CNSC should conduct its own technical analyses to determine what accident/emergency scenarios are possible, what should be responded to and the standards for deciding this (e.g. natural disasters of a certain probability), and how they should be responded to (including what an acceptable tolerance for error/failure is). This should form the basis for the more definite standards called for in **Recommendations 22-27**. Further, as the regulations related to this issue are often couched in guidance, provisions instructing licensees as to what they should plan for should be made mandatory.

d. Discretionary Information Disclosure and Lessons from Tepco

As Tepco showed the world after the Fukushima disaster, even an entity that is in theory highly regulated and open to the public may downplay and hide information that is averse to its interests.[99] In several instances, RD

[97] *E.g. Greenpeace Canada v. Canada (Attorney General)*, 2014 FC 463 (CanLII), p. 320, available online: http://canlii.ca/t/g6z5z.
[98] *E.g. Greenpeace Canada v. Canada (Attorney General)*, 2014 FC 1124 (CanLII), p.30, available online: http://canlii.ca/t/gfdx9.
[99] Adelstein, *supra* note 13; Saito, *supra* note 15.

2.10.1 and 2.3.2 leave several important aspects of information disclosure up to the discretion of licensees. While the regulations and EMO's *PNERP* do specify some monitoring of facilities by CNSC staff and other outside personnel,[100] much of the monitoring is still handled by the licensee. This makes technical sense since each facility will necessarily be monitoring its own activities and radiation levels. However, coupling much of the information gathering with various forms of discretionary release may impede the release of information that the public or the CNSC may want. This is especially true in the case of BP because it is not subject to *FIPPA*, not being an "institution" under that law.[101] Thus, it is already relatively free to withhold a lot of data and information about its internal processes.

Paragraph 1 of RD 2.10.1, Section 2.2.7 instructs licensees to "provide information about the emergency" to relevant offsite authorities during an ongoing emergency to help the offsite authorities to respond to it. The content and extent of the information that must be provided and the rate at which it must be provided or updated are not specified.[102] Further, the Guidance section of Section 2.2.4 tells licensees that all communications, event data, and decisions "should" be recorded, but does not make such mandatory. This would appear to confer significant discretion upon a licensee as to what it needs to provide to emergency responders or to do to maintain a written record for the public. The concern that raises is the potential to withhold significant amounts of information about chemical and radiological releases from responders and the public, as Tepco did in the days, weeks, and years following the Fukushima accident.[103] As is the case with many of the CNSC's regulations, the "Guidance" section under the binding provisions does provide some forms of information disclosure that the CNSC would like. However, even

[100] *PNERP*, s. 5.14; Reg. Doc 2.10.1, s. 2.2.6, point 7.
[101] *Freedom of Information and Protection of Privacy Act*, RSO 1990, c. F.31, ss. 2(1), 10(1) (definition of institution and applicability of *FIPPA*).
[102] Reg. Doc 2.10.1, s. 2.2.7.
[103] Saito, *supra* note 15.

if it were not put in a section entitled "Guidance", which means "non-binding", these provisions are always made with the word "should", which does not create binding, enforceable obligations.[104]

Licensees are subject to other public disclosure regulations, like the CNSC's RD/GD-99.3, but these regulations suffer from the same problems as the emergency planning and accident management regulations. RD/GD-99.3 is constructed in the same manner as these regulations in that it enumerates several concerns that licensees must address, but gives not directives as to how they should be addressed or what will be sufficient addressing of them. Ultimately, despite supplementing licensees' disclosure requirements in the emergency response and accident management regulations, they still leave the system unclear and indefinite.[105]

Recommendation #30: Information disclosure requirements should be mandatory, and explicitly state what kinds of information need to be disclosed and how frequently they need to be updated.

Recommendation #31: CNSC monitoring staff present at the facilities and emergency response areas should continuously gather data independently on their own and build a public record with it. To the extent that CNSC staff would not have access to the same information as licensee staff, CNSC staff should be given the same access to ensure openness. CNSC staff should conduct its own analysis of the data, rather than relying on licensees for interpretation and response guidance. If the CNSC's current staff is insufficient, because nuclear accidents are such a serious threat to the public, it is worth investing in more staff.

[104] Reg. Doc 2.10.1, s. 2.2.4.
[105] RD/GD-99.3, http://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/rdgd993/index.cfm.

Recommendation #32: Because of the volume of analysis that is conducted by Bruce Power in support of licensing decisions and other important regulatory decisions by the CNSC, Bruce Power should enter into a written agreement with the CNSC to subject itself to *FIPPA*.

III. Conclusion and Restatement of CELA's Recommendations

Overall, the existing regulatory system that governs the relicensing process is unclear, unpredictable, and favours the interests of licensees over those of the public through serious over-delegation. As has been shown, the CNSC's system relies on licensees for most of the study of different aspects of emergency planning and accident management. Not only that, the existing system leaves most substantive decisions and testing thereof to licensees as well, making licensees substantially self-governing. This gives licensees many opportunities to downplay risk and minimize costly emergency preparations to the detriment of the public. Given the serious nature of nuclear accidents and the pro-public mandate of the regulatory system, this is highly inappropriate and very likely to result in inadequate emergency preparation and response on the part of licensees. To correct this problem, CELA strongly advises that the CNSC implements its recommendations throughout the remainder of the BP relicensing process to ensure that the public's safety and other interests are properly protected by a thorough and impartial regulatory system. If need be, the relicensing should be delayed until such time as these recommendations have been properly implemented.

Recommendation #22: The provisions contained in the "Guidance" sections of Reg. Docs 2.3.2 and 2.10.1 should be made mandatory and as such should be rewritten with binding language (e.g. "will" and "must" vs. "should" and "may").

Recommendation #23: The CNSC's assorted regulations and the Conditions contained in the proposed License and Licence Conditions Handbook (*LCH)* (since it is unlikely that new regulations will be made in time for an official decision on the BP license) should be expanded to contain specific provisions making what will be sufficient consideration or planning for different disasters clear. This must include engineering and scientific standards that make what will be sufficient evidence of a claim about the nature of a potential situation and the sufficiency of a proposed solution to it clear.

Recommendation #24: Since CSA standards, like N1600-14,[106] do not always themselves offer technical standards, the CNSC should conduct its own studies to create and implement them where they are currently absent. The regulations should be updated accordingly.

Recommendation #25: Any private standards incorporated into regulations or a licensing decision should be made readily publicly accessible as well. Doing this would greatly enhance regulatory clarity, predictability, and consistency for the public.

Recommendation #26: As it creates new and specific technical standards, the CNSC should publish all of the studies it conducts to develop and implement them in an accessible, user-friendly index on its website so that the public and outside experts can easily find and review them. To the extent that publishing them in both of Canada's official languages is a problem, the CNSC should hire additional translation staff. Using this as a reason to avoid publication goes against the purposes of having both official languages and is not a valid reason for withholding important public information.

[106] *N1600-14: General Requirements for Nuclear Emergency Management Programs*, CSA Group.

Recommendation #27: The CNSC should revise Reg. Docs 2.3.1. and 2.10.1 and add Conditions to the License and *Licensing Conditions Handbook (LCH)* so that the CNSC will be solely responsible for the development and implementation of testing methodologies and scenarios that examine whether existing emergency response/management systems actually work. The CNSC should also develop its own data analysis methodologies and testing pass/fail standards and publish them so that the public is aware of what exactly adequate emergency response will be and to eliminate the potential for pro-licensee bias in the system. This will both improve the system's transparency and give the public a more appropriate level of input in these processes.

Recommendation #28: The CNSC should conduct its own gap analysis to determine what aspects of nuclear safety and emergency management are not covered by existing regulations and safety/emergency response plans. Ensuring that all safety concerns are addressed is the job of a regulator, not a licensee. Based on this, the CNSC should add further conditions to the Bruce Power License and begin to develop further accident management and safety regulations that will address any issue that the existing regulations do not.

Recommendation #29: The CNSC should conduct its own technical analyses to determine what accident/emergency scenarios are possible, what should be responded to and the standards for deciding this (e.g. natural disasters of a certain probability), and how they should be responded to (including what an acceptable tolerance for error/failure is). This should form the basis for the more definite standards called for in **Recommendations 22-27**. Further, as the regulations related to this issue are often couched in guidance, provisions instructing licensees as to what they should plan for should be made mandatory.

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Recommendation #32: Because of the volume of analysis that is conducted by Bruce Power in support of licensing decisions and other important regulatory decisions by the CNSC, Bruce Power should enter into a written agreement with the CNSC to subject itself to *FIPPA*.

D. Reactor Aging and the Precautionary Principle

Operating reactors beyond their original anticipated design lives [violates the precautionary principle, basic principles of the rule of law, and the implicit agreement the public entered into with NPPs when these facilities were originally built. Public protective laws should not be bent for present expediency in any event, but especially not in an instance when doing so would expose the public to an enhanced risk in an already high-risk industry that the public did not contemplate when it first approved of the Bruce plant and other nuclear facilities.

In the law, the "precautionary principle" stands for the general proposition that when the environment or human health are threatened, anticipatory and protective action should be taken, even if the outcome and level or risk are uncertain.[107] Reactor life extensions invert this reasoning: there is a threat with an uncertain level of risk, but extended-life NPPs are allowed to continue operating under the hopeful assumption that nothing will ultimately go wrong. The well-known and documented problems of reactor aging, like hydride leaching in pressure tubes and size/shape distortion of fuel tubes, make these core reactor features more susceptible to cracking and physical damage as the reactors age.[108] These parts will only continue to become more vulnerable as the reactor ages, an increased risk which the original reactor lifespans appear to be designed to pre-empt (because they end reactor life well in advance of component failure due to wear).[109] Further, this increased risk is contrary to the goals of the heightened attentiveness to major

[107] *Compare* "A Precautionary Tale: Trials and Tribulations of the Precautionary Principle", Chris Tollefson, A Symposium on Environment in the Courtroom: Key Environmental Concepts and the Unique Nature of Environmental Damage, University of Calgary (2012), at N. 19 *with* Theresa McClenaghan, "Precautionary Principle", Encyclopedia of Quality of Life Research (2013).

[108] "Pickering Fuel Channel Fitness for Service Report", Ontario Power Generation, at s. 4.0, 4.1, available online: http://www.opg.com/generating-power/nuclear/stations/pickering-nuclear/Documents/PickeringFuelChannel_FitnessForServiceReport.pdf.

[109] *Ibid*. Since OPG's current estimates of useable life go beyond current regulatory limits, this is assumed by us to be the rationale.

and unexpected natural disasters of the post-Fukushima CNSC.[110] It is curious that nuclear facilities are being required to invest in a variety of expensive safety features to be built on top of an old reactor core that is increasingly vulnerable to external trauma.

Ontario, Canada, and their NPPs have only begun their own experiences with extended life nuclear reactors in the past few years.[111] At present, they lack concrete, substantiated evidence of their own for the long-term safety of extended-life reactors to present to the public. The US, on the other hand, now has significant experience with extended life reactors. Many of the US reactors that have been granted extended lives have been shuttered prematurely because of increases in maintenance issues that come with them.[112] More component failures mean more safety risk to the public.

In this case, little has changed since these reactors were originally built: the core is necessarily still built with the same components and technology.[113] The context in which the reactor exists has changed, but not in a way that favours increased leniency with reactors. This approval happens in the post-Fukushima world, wherein it is now widely known that even first-rate reactors in the developed world can have serious accidents when existing regulations and management provisions are applied loosely to them.[114] The only thing that appears to have changed in favour of granting this extension is the rapid approach of the end of the original lifespans of many reactors in Ontario's

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[110] *E.g.* "CNSC Integrated Action Plan on the Lessons Learned from the Fukushima Daiichi Nuclear Accident", Canadian Nuclear Safety Commission, available online: http://nuclearsafety.gc.ca/eng/resources/publications/reports/action-plan-fukushima/index.cfm.

[111] "Nuclear Power in Canada", World Nuclear Association, available online: http://www.world-nuclear.org/info/Country-Profiles/Countries-A-F/Canada--Nuclear-Power/.

[112] "Nuclear Plants, Old and Uncompetitive, Are Closing Earlier than Expected", Matthew L. Wald, New York Times, available online: http://www.nytimes.com/2013/06/15/business/energy-environment/aging-nuclear-plants-are-closing-but-for-economic-reasons.html?_r=0.

[113] *See e.g.* "Pickering Fuel Channel Fitness for Service Report", *supra* note 2, at s. 4.0.

[114] E.g. Inept and Ill-Prepared: A Closer Look at the Fukushima Report, Jake Adelstein, The Wire, 5 July 2012, available online: http://www.thewire.com/global/2012/07/inept-and-ill-prepared-closer-look-fukushima-report/54229/.

fleet.[115] However, the CNSC's jurisdiction is limited to safety and similar issues, and so its approval of the extension of these reactors' lives must only consider these issues, rather than whether Ontario "needs" these reactors.[116] Because extended life reactors would seem to subject the public to a greater safety risk, the CNSC should not approve them.

Life extensions are also contrary to the public safety rationale of these nuclear regulatory rules in that the public will be exposed to a notably greater risk than the one it consented to when it approved the original construction of these facilities. When the public originally approved the construction of these and Ontario's other reactors, by necessary implication it only agreed to the level of risk the original 210,000-hour life would entail, on the assessment at the time that this would present a relatively minimal risk of a major core component failure. If the NPPs are allowed in later life to exceed the parameters of this original analysis, the public cannot really know what level of risk it is actually taking on when it approves the construction of a reactor or any other major public work. Outcome certainty is especially important for long-term infrastructural projects that will last through changes in the social and political context that surround them. Implied bargains between the public, the regulators, and industry, on safety measures such as safe operation length of critical components should not be subject to unilateral amendment by late in life operating extensions of these components.

Recommendation #33: **T**he proposal to operate Bruce Power units beyond the originally designed lifespan of 210,000 Effective Full Power Hours of pressure tubes should be denied.

[115] "Nuclear Power in Canada", *supra* note 5.
[116] *Nuclear Safety and Control Act*, SC 1997, c. 9, s. 3, 44.

E. Decision Requested

CELA requests that the CNSC grant neither Bruce Power A and B facilities the life extensions nor the license to operate these facilities requested by Bruce Power. Rather, CELA requests that the CNSC order Bruce Power to prepare an application for the orderly closure and decommissioning of its aging reactors.

All of which is respectfully submitted this 16th day of March, 2015:

CANADIAN ENVIRONMENTAL LAW ASSOCIATION

Per

Theresa A. McClenaghan

Executive Director and Counsel

APPENDIX 1

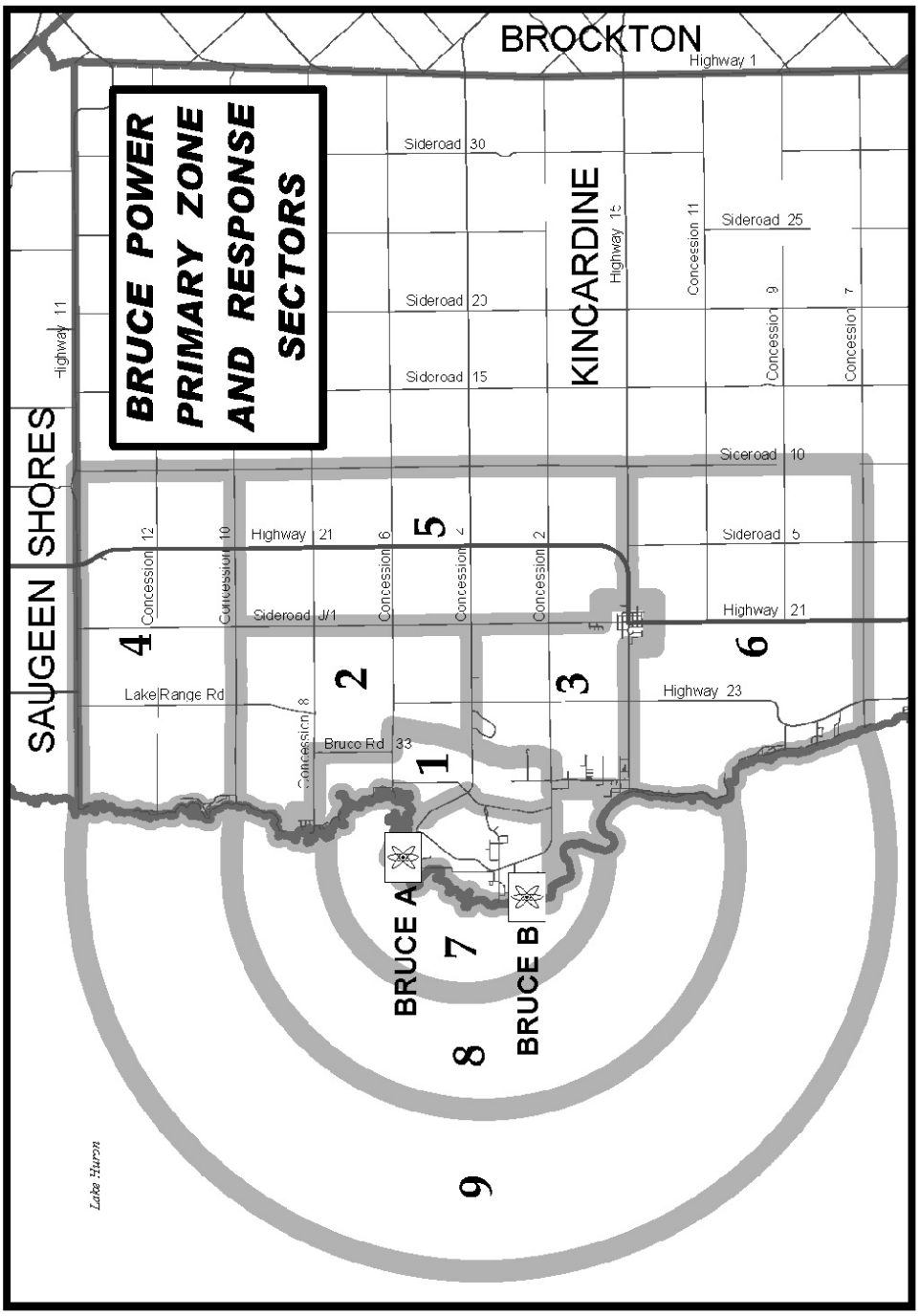
KINCARDINE NUCLEAR EMERGENCY RESPONSE PLAN

This document is too long to append. However, it is available online:

http://www.kincardine.net/public_docs/documents/MOK%20Emergency%20Response%20Plan%20rev%207%202006%20FINAL%20Clerk2.pdf

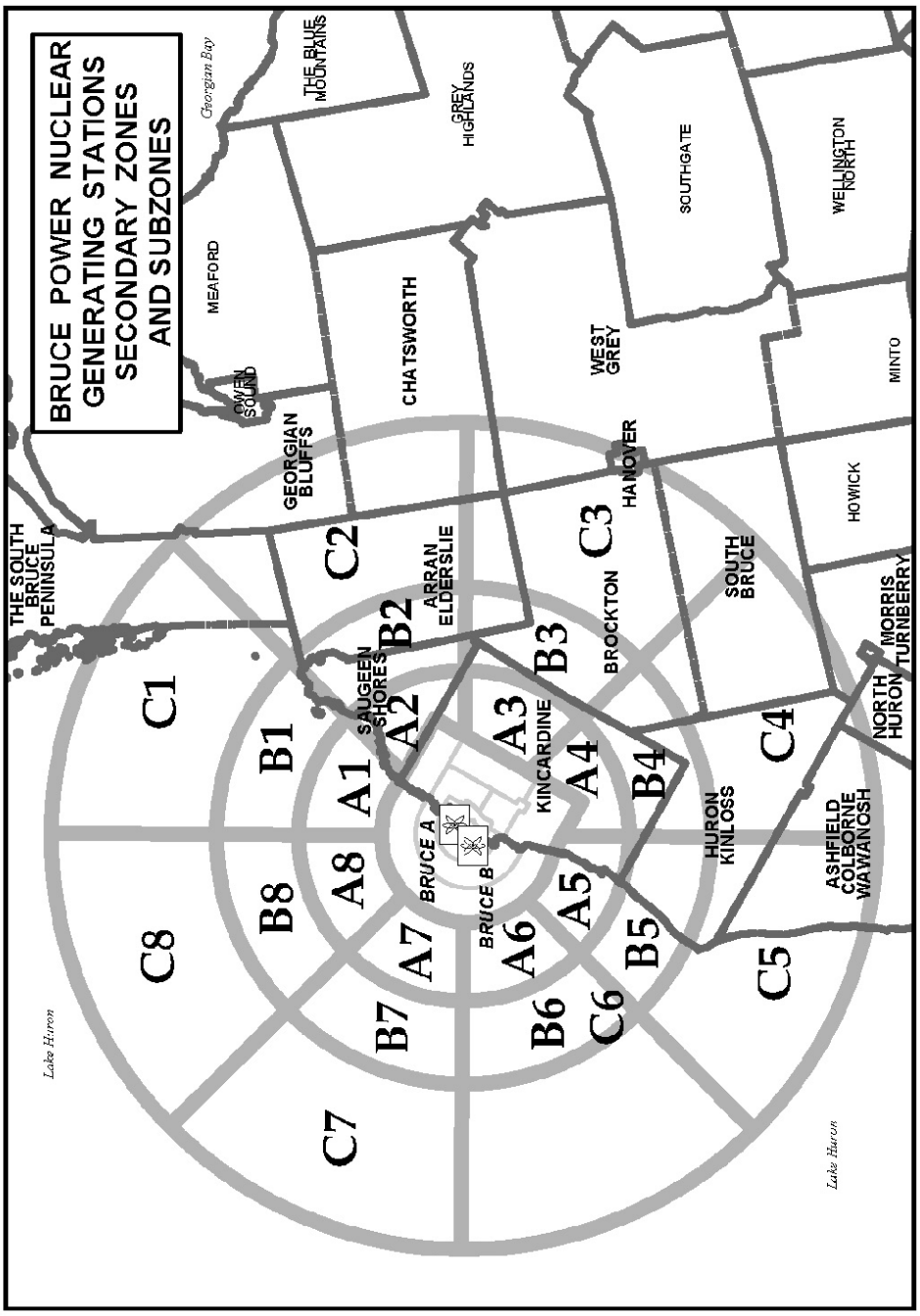
APPENDIX 2

IMPLEMENTING PLAN FOR BRUCE POWER (2009), FIGURE 2.3



APPENDIX 3

IMPLEMENTING PLAN FOR BRUCE POWER (2009), FIGURE 2.4



APPENDIX 4

ONTARIO CABINET COMMITTEE ON ENVIRONMENTAL POLICY REPORT

NOVEMBER 18, 1993

Canadian Environmental Law Association
EQUITY. JUSTICE. HEALTH.

March 20, 2015

Louise Levert
Canadian Nuclear Safety Commission
280 Slater St., P.O. Box 1046
Ottawa, Ontario K1P 5S9

Sent via e-mail

Re: CNSC Hearing 2015-H-02 CELA Report, “confidential” document

Dear Ms. Levert:

The 1993 Cabinet submissions labeled "confidential" (Appendix 4 of our report) are now available to the public. CELA received the document from Greenpeace, which had itself received them in public disclosure under Section 12(2)(b) of the Freedom of Information and Protection of Privacy Act. If you have any further concerns with this document or anything else in CELA's submissions, please do not hesitate to contact me by e-mail at jeremy.dixon@cela.ca or by phone at 514-718-7698.

Best regards,

Jeremy Dixon

Canadian Environmental Law Association
T 416 960-2284 • F 416 960-9392 • 130 Spadina Avenue, Suite 301 Toronto, Ontario M5V 2L4 • cela.ca

Ontario

Cabinet Submission

Revision of Submission dated	
Date	**September 30, 1993**

CS 8813/93

NUCLEAR EMERGENCY PLANNING AND PREPAREDNESS

SEPTEMBER 30, 1993

Cabinet Submission
Proposal and Recommendation

Ontario

Revision of Submission dated

Date: **September 30, 1993**

1. Key Issue

Whether the Province should change the basis for nuclear emergency planning to include more severe accidents, and implement consequential measures for increasing public safety.

2. Background

Ontario's Nuclear Emergency Plan was approved and promulgated by the Lieutenant-Governor-in-Council, in June 1986. The measures prescribed in the Nuclear Plan are designed to deal with nuclear accidents up to a certain level of severity. This level assumes a delay in the emission of radioactivity from the station to the environment, and precludes any early health effects among the public living around the station.

Proposed measures to increase levels of public safety developed by Provincial Working Group #8 include expansion of the planning zones; the availability and distribution of potassium iodide pills; the need for early warning systems for the public; the need for adequate medical facilities to deal possible acute radiation exposure and the advisability of restricting construction near any new nuclear facilities.

3. Proposed Direction ☒ Major Policy ☐ Minor Policy ☐ Program Change

The Ministry is seeking approval to expand the technical basis of the Provincial Nuclear Emergency Plan to cover accidents beyond the current design basis and implement consequential measures for increasing public safety.

4. Benefits and Possible Adverse Consequences

- Public safety in the event of a nuclear accident at nuclear facilities will be significantly enhanced.
- Nuclear planning and preparedness measures will include measures which may prevent early health effects resulting from accidents beyond the current design basis.

Adverse consequences

- The introduction of changes to the Provincial Nuclear Emergency Plan may raise some initial concerns regarding current nuclear emergency preparedness planning and response procedures.

5. Alternatives Considered

- Retain the existing basis of the Provincial Nuclear Emergency Plan with no changes or additional preparedness measures undertaken.
- Expand the planning basis to the include the worst credible emission level of severity.
- Expand the planning basis to take into account more severe accidents than is currently the case and implement enhanced planning and preparedness measures.

6. Assumptions

Expanded nuclear planning and preparedness measures will significantly enhance public safety in the areas surrounding nuclear stations.

Cabinet Submission
Proposal and Recommendation

Ontario

Revision of Submission dated

Date **September 30, 1993**

7. Related Concerns

Anti-nuclear interest groups are unlikely to be satisfied and would still criticize the measures as inadequate.

8. Financial Implications ($000)	Current Year	Next Year	Fully Mature/Total Cost
Expenditure — Operating ▶			
Expenditure — Capital ▶			
Expenditure — Total ▶			
Revenue/Cost Sharing/Offset			
Funding requirements beyond existing allocation			
Staffing Implications (full-time equivalents)			

9. Consultation Record (Y - Consulted and satisfied / N - Consulted and significant concerns unresolved)

[Y] Ag & Food	[ ] Cab Office	[ ] Corr Serv	[ ] Fin Inst	[Y] Lab	[Y] MNR	[ ] Rev	[Y] Transp	[ ] Charter	[ ] Premier's Office			
[ ] Att Gen	[ ] Citz	[ ] Educ	[Y] Hlth	[ ] MBC	[Y] Mines	[ ] Skills	[ ] T & E	[ ] Disabled	[ ] Race			
[ ] C.C.R.	[ ] Cult & Comm	[Y] Ene	[ ] Hous	[Y] MGS	[Y] Mun Aff	[ ] Sol Gen	[ ]	[ ] Franco-Phone	[ ] Seniors			
[Y] C.S.S.	[ ] Coll & Univ	[Y] Env	[ ] IT & T	[ ] MIA	[ ] N. Dev	[ ] Tour & Rec	[ ]	[Y] Native	[ ] Women's			

Unresolved Concerns

10. Legislation/Regulation required	Statute	Other Statutes affected
[X] No [ ] New [ ] Amendment		

11. Communications

Decision message: **Public safety is of paramount concern to the Government of Ontario. Public safety policies, programs, and practices must be responsive to local needs.**

Decision announcement: **The Minister will make an announcement in the Legislature. Also, a public announcement will be made by the Minister. A media release and backgrounder will be issued to media throughout Ontario.**

12. Committee Sequence

Indicate in numerical order, the sequence this proposal is to follow.

[ ]	[3] Cabinet	[ ] Housing & Community Development	[ ] Native	[ ] Race
	[ ] Drugs	[ ] Justice	[ ] Northern	[ ] Regulation
	[1] Economic & Environment	[ ] Legislation	[2] Policy & Priorities	[ ] Social
	[ ] Education, Training & Adjustment	[ ] Management Board	[ ]	[ ]

Deputy Minister's Signature ▶ Michael Mobbs

THE MINISTRY OF THE SOLICITOR GENERAL AND CORRECTIONAL SERVICES RECOMMENDS THAT:

* THE PROVINCIAL NUCLEAR EMERGENCY PLAN SHOULD BE AMENDED TO ADOPT PROVISIONS FOR NUCLEAR ACCIDENTS BEYOND THE CURRENT DESIGN BASIS TO INCLUDE MORE SEVERE ACCIDENTS.

* AN APPROPRIATE EARLY WARNING SYSTEM SATISFACTORY TO THE MINISTRY OF THE SOLICITOR GENERAL AND CORRECTIONAL SERVICES BE IMPLEMENTED IN THE CONTIGUOUS ZONE.

* EVACUATION PLANS FOR PRIORITY MOVEMENT AND MONITORING/DECONTAMINATION OF PEOPLE FROM WITHIN THE CONTIGUOUS ZONE BE UPGRADED.

* ARRANGEMENTS SATISFACTORY TO THE MINISTRY OF THE SOLICITOR GENERAL AND CORRECTIONAL SERVICES BE MADE FOR THE PREDISTRIBUTION OF POTASSIUM IODIDE PILLS IN THE CONTIGUOUS ZONE.

* ARRANGEMENTS FOR THE MEDICAL TREATMENT OF PERSONS FROM THE ZONE WHO COULD SUFFER EARLY HEALTH EFFECTS BE ESTABLISHED.

* PERSONS LIVING AND WORKING IN THE CONTIGUOUS ZONE WILL BE INSTRUCTED AS TO PROPER RESPONSE TECHNIQUES IN THE EVENT OF SUCH AN ACCIDENT.

* UPGRADES OF THE LEVEL OF PREPAREDNESS NECESSARY TO IMPLEMENT THE MEASURES PRESCRIBED IN PROVINCIAL AND MUNICIPAL NUCLEAR EMERGENCY PLANS BE MADE.

* THE CONTROL INFRASTRUCTURE REQUIRED TO MANAGE A SERIOUS NUCLEAR EMERGENCY BE ENHANCED.

* PROCEDURES AND ARRANGEMENTS FOR THE UTILIZATION OF NATIONAL AND INTERNATIONAL ASSISTANCE TO AUGMENT PROVINCIAL RESOURCES BE ESTABLISHED.

* THE PRIMARY ZONE SURROUNDING BOTH THE DARLINGTON AND BRUCE NUCLEAR GENERATING STATIONS BE EXPANDED FROM 10 KILOMETRES TO 13 KILOMETRES.

Minister's Signature ▶

INTRODUCTION

In recognizing the need for improved Nuclear Emergency Preparedness, there is a commitment to preventing early health effects resulting from accidents beyond the scope of predictable engineering or human failure (design basis). As a means of addressing this need for improved planning a variety of measures are recommended for implementation.

Some of the factors considered in developing these recommendations include:

- the report of Provincial Working Group #8;
- the recommendations of the Ontario Nuclear Safety Review (Hare Commission);
- public opinion and impact;
- international practice;
- recent studies of severe accidents, including the Atomic Energy Control Board's; and
- resource requirements for implementation of the recommendations.

ISSUE:

Whether the Province should change the basis for nuclear emergency planning to include more severe accidents, and implement consequential measures for increasing public safety.

PROPOSED DIRECTION:

Approval is sought to expand the technical basis of the Provincial Nuclear Emergency Plan to cover accidents beyond the current design basis and, as a consequence, include the following measures/changes in the Plan:

Planning Basis

The Provincial Nuclear Emergency Plan currently considers only design basis accidents. However accidents beyond design basis, though very unlikely, are not physically impossible. Such accidents, could result in significantly higher offsite doses of radiation, with the possibility of early health effects in the area contiguous to the nuclear site.

It is recognized that the Provincial Nuclear Emergency Plan should include provisions for nuclear accidents greater in scope than design basis and should prescribe appropriate additional measures to preclude or minimize early health effects in the Contiguous Zone (3-4 kilometres radius) of each nuclear station.

Preparedness Measures

To protect people in these Contiguous Zones from the effects of accidents beyond design basis, the following measures should be prescribed in the Provincial Nuclear Plan:

a) Installation of an early warning system that can, in a timely fashion, alert people in the zone to the occurrence of an accident. Such a system could be based on tone-alert radios, automatic telephone dialling, power pulse alarms or, mobile or fixed sirens as found to be appropriate. A thorough analysis will be undertaken to determine the most appropriate method of early warning to be implemented.

b) Provision of improved evacuation plans for priority movement and monitoring/decontamination of people from within the Contiguous Zone.

c) Predistribution of potassium iodide pills to ensure the timely availability to the affected population in the Contiguous Zone.

d) Establishment of arrangements for the medical treatment of persons from the zone who could suffer early health effects.

e) Provisions for persons living and working in the Contiguous Zone to be instructed as to proper response techniques in the event of such an accident.

Primary and Secondary Zones

The effects of an accident beyond design basis will impact on areas beyond the Contiguous Zone, though less severely. To address these effects, it is necessary to update the level of preparedness in these areas. Accordingly, the following measures are required in the Primary and Secondary Zones:

a) Comprehensive upgrading of the level of preparedness to implement the measures prescribed in Provincial and Municipal Nuclear Emergency Plans.

b) Enhancement of the control infrastructure (operations centres, telecommunications, computer facilities, etc.) required to manage a serious nuclear emergency.

c) Establishment of procedures and arrangements for utilization of national and international assistance to augment provincial resources.

Planning Zone Expansion

Some planning zones are proposed to be expanded beyond the current 10 km radius. The current 10 km zone for Darlington is impracticable as it includes only a portion of the City of Oshawa. The Primary Zones surrounding Darlington and Bruce should be extended to reflect the recommendations of Working Group #8. The Primary Zone around Pickering will remain unchanged as its expansion was not technically supported but was recommended by the Working Group primarily for the purpose of consistency with Darlington and Bruce.

BACKGROUND:

Provincial Nuclear Emergency Plan

Ontario's Nuclear Emergency Plan was approved and promulgated by the Lieutenant-Governor-in-Council, in June 1986. A nuclear emergency, in the context of this plan, is an emergency at a nuclear facility which poses a radiation hazard to people or property offsite. A nuclear facility is defined within the context of this plan as a nuclear reactor, a sub-critical nuclear reactor or a plant for the separation, processing, reprocessing or fabrication of fissionable substances from irradiated fuel. It also includes all land, buildings and equipment that are connected or associated with these reactors and plants. Offsite refers to the area outside the boundary fence of a nuclear facility.

The plan requires the area around each nuclear facility to be divided into two zones - a Primary Zone and a Secondary Zone. The Secondary Zone, which encompasses and extends beyond the Primary Zone, is the radius around the reactor for which measures against radioactive contamination of the food chain and the consumption of contaminated food and water are prepared. For Ontario-based reactors, the Contiguous Zone is 3-4 km in radius, the Primary and Secondary Zones are currently 10 km and 50 km respectively. For Fermi 2 these zones are 21.5 km and 80 km respectively.

The measures prescribed in the plan are designed to deal with nuclear accidents up to a certain level of severity. This level assumes a delay in the emission of radioactivity from the station to the environment, and precludes any early health effects among the public living around the station. It also determines the size of the area (called the Primary Zone) around the reactor for which detailed plans, including evacuation plans, are prepared to protect people against the effects of direct exposure to radiation emitted during a nuclear accident.

Chernobyl, U.S.S.R.

In 1986, a major nuclear accident occurred in the Soviet Union at the Chernobyl nuclear station. The cause and severity of the accident were due, among other things, to basic design weaknesses in the reactor and criminal negligence by the plant staff. This accident was much more severe than the level used as the basis for the Ontario Nuclear Emergency Plan, and resulted in the evacuation of the population out to 30 km around the station.

Following this accident, Ontario established the Ontario Nuclear Safety Review (to review the safety of Ontario Hydro's CANDU reactors and their associated emergency plans) and Provincial Working Group #8 (to review the technical basis of the Provincial Nuclear Emergency Plan).

Ontario Nuclear Safety Review

The Ontario Nuclear Safety Review was established to examine and report on the safety of nuclear power stations in Ontario, and the emergency planning being done to deal with possible accidents. The Ontario Nuclear Safety Review submitted its report to the Province on February 29, 1988.

Provincial Working Group #8

Provincial Working Group #8 was constituted to reexamine the technical basis for nuclear emergency planning in Ontario and to make recommendations based on the review. Its chairman was Dr. K. G. McNeil of the University of Toronto and its six members drawn from the Ministries of the Solicitor General and Labour, Ontario Hydro, the Atomic Energy Control Board, Atomic Energy of Canada Limited and the University of Toronto.

Provincial Working Group #8 submitted its report to the Province on June 30, 1988. The Working Group recommended that the Primary Zones for the Ontario Hydro nuclear stations at Bruce, Darlington and Pickering be increased to 13 km and that the radius for Chalk River remain at 10 km. An examination of the calculations done by the Working Group indicates that the recommendation to increase the size of the Pickering Primary zone was due to a desire to achieve uniformity with the proposed increase for the Darlington and Bruce zones. The Pickering reactors are much smaller in size than those in the other two stations and technically the numbers themselves do not support an increase of the Pickering Zone.

The Working Group's report also recommended that the Province should take appropriate measures, in light of its recommendations, in the following areas: the availability and distribution of potassium iodide pills; the need for early warning systems for the public; the need for adequate medical facilities to deal with possible acute radiation exposure and the advisability of restricting new housing construction near nuclear facilities.

The report of Working Group #8 was circulated for comment to over 65 groups and individuals including federal departments, Ontario ministries, municipalities, interest groups, Ontario Hydro, Detroit Edison (operator of Fermi 2), Atomic Energy of Canada Limited, and the Atomic Energy Control Board. The vast majority of the respondents concurred with the recommendations made.

ANALYSIS:

Should the Province accept the recommendations of the Nuclear Safety Review and Provincial Working Group #8 and adopt a planning basis that goes beyond the current basis to include more severe accidents?

It is understood that the present basis for nuclear emergency planning is inadequate. The worst case emission basis proposed by Working Group #8 causes considerable difficulty in obtaining a consensus on the numerical values for such an emission and its effects. This is because these quantifications are affected by the many assumptions that go into the calculation. Considerable divergence can exist among technical opinion on what assumptions can or cannot be appropriately made. The Working Group itself drew attention to the dependence of its calculations on the assumptions it had made.

An intermediate position is to include in the planning basis accidents more severe than the ones now used which result in a large and immediate emission of radioactivity that could cause early health effects in the area near the nuclear station. Such a planning basis would still enable the undertaking of practical measures required to enhance public safety. Both the Nuclear Safety Review and Provincial Working Group concur with this intermediate position.

What consequential measures flow from the intermediate position of enhanced nuclear emergency planning and preparedness recommended?

If the existing basis for nuclear emergency planning were to be retained as is, then no additional planning and preparedness would be required beyond that already being carried out. To go beyond the current planning basis the measures outlined in the proposed direction would need to be undertaken. The chair of Working Group #8 fully supports the proposed measures and concurs that this level of enhanced preparedness meets the concerns identified by the Working Group and the Ontario Nuclear Safety Review.

The definition of the area near the nuclear facility within which the enhanced preparedness should take place is also subject to review. The Provincial Nuclear Emergency Plan has demarcated around each of the Ontario Hydro nuclear stations a Contiguous zone, approximately 3-4 km in radius.

Their purpose is to provide an increased level of emergency planning and preparedness within this area, compared with the rest of the Primary zone because of its proximity to the potential nuclear hazard. These already demarcated zones provide reasonable and generally accepted areas within which to implement the intermediate position.

Public Support and Interest In Nuclear Emergency Planning and Preparedness Measures Remain High

In surveys conducted by Ontario Hydro in the 10 km zones around their Darlington, Pickering and Bruce stations, Decima Research were asked to measure awareness and recall of nuclear emergency planning; to assess the reactions to the booklet "Planning for an Emergency"; to evaluate the perceived effectiveness of the plans and the need or desire for more information; and to assess impressions on Ontario Hydro's communications with the community.

Resident's living in a nuclear station community in general indicate a high level of confidence in the people who run the plant (over 90% in each location); believe Hydro is concerned about safety (over 85% in each community); and do not believe that an emergency situation is likely to occur in the next few years.

Among the questions asked were some directly related to the proposed changes in the Provincial Nuclear Emergency Plan. Respondents (Darlington 95%, Pickering 92%, and Bruce 84%) overwhelmingly believe it is "very" or "somewhat" important that there should be additional procedures or information for people living within 3-4 km of the plant. When asked about proposed additional procedures (including special procedures for evacuation, KI pills placed in their homes, or an early warning system) the majority of respondents believed that such measures would either have no effect on or improve the quality of life in the area.

As the Province has recognized the need for improved Nuclear Emergency Preparedness through a commitment which may prevent early health effects resulting from accidents beyond the scope of predictable engineering or human failure (design basis), the proposed changes to the Provincial Nuclear Emergency Plan represent a proactive and timely response in support of continued preventative measures in this vital area of public safety.

Predistribution of KI Pills in the Contiguous Zone

The issue of the use of stable iodine compounds during a nuclear emergency in Ontario was studied by a Provincial Working Group which reported in 1984. Representatives from the Ministry of Health, Ministry of Labour, Health and Welfare Canada, Ontario Hydro and St. Joseph's Health Centre formed Provincial Working Group #2. In its report the Working Group concluded that KI's "side effects are minimal", and recommended that "KI tablets should be predistributed to those who may be required to take them in an emergency." A Provincial Policy on the use of stable iodine in a nuclear emergency was approved by Cabinet in early 1986 and promulgated. Many jurisdictions throughout the world have predistributed KI in areas around nuclear facilities, including the Province of New Brunswick.

While the Ministry of Health has expressed some minor concerns (such as shelf life), the ministry does not have major public health concerns about the appropriateness of predistribution of stable KI to the residents within 3-4 km of the immediate perimeter of a nuclear facility.

While both the Ministry of the Solicitor General and Correctional Services and Ontario Hydro agree on the benefits in the prevention of early health effects provided by KI pills, opposing views remain on the level of pre-distribution. Ontario Hydro has expressed the view that medical opinion is divided on the risks of pre-distributing KI pills. Ontario Hydro feels that sufficient pre-distribution has been achieved through deliveries to local schools, police stations and other designated pick-up points while not raising undue alarmist concerns.

The Ministry of the Solicitor General and Correctional Services feels that given the purpose of the Nuclear Emergency Plan, that is, to deal most effectively with the effects of an accident should one occur, the need for the widest scope of predistribution is clear. In order to protect the public from the hazards arising from a severe accident resulting in an early emission of significant quantities of radioactivity, the need to ingest stable KI would be immediate. Such an emission is likely to contain significant amounts of radioiodine. The people nearest the nuclear stations must be able to immediately ingest KI pills while taking other appropriate action such as evacuation or sheltering.

If the Contiguous Zone is subject to significant radiation fields, residents will not be able to leave their shelters to go and collect KI from distribution points. It is also beyond reasonable expectation that emergency personnel would be able to distribute KI in the radioactive area on a door to door basis. Pre-distribution is the only way to ensure that immediate ingestion of KI pills is achieved.

There are three potential options to resolve the issue of predistribution of potassium iodide pills.

> Option A: Proceed with the status quo of predistribution to local schools, police stations and other designated pick-up points.
>
> Option B: Make satisfactory arrangements for the general predistribution to the population in the Contiguous Zone.
>
> Option C: Make satisfactory arrangements for the selective predistribution of potassium iodide pills to those persons in the Contiguous Zone who wish to receive them.

The Ministry of the Solicitor General and Correctional Services feels that each of the options present some benefits and difficulties. However from a public safety perspective, and in keeping with the measures needed to mitigate the effects of an accident should one occur, general predistribution to the population within the Contiguous Zone is the preferred option. The selection of any other option for predistribution will fall far short of the requirements of an effective nuclear emergency plan.

RECOMMENDATION

Option B: Make satisfactory arrangements for the general predistribution to the population in the Contiguous Zone.

OPTIONS FOR THE PROPOSED DIRECTION:

OPTION 1

The existing basis of the Provincial Nuclear Emergency Plan be retained without any change, and no additional preparedness measures be undertaken.

Advantages

* No additional measures are required and Ontario Hydro would incur no additional costs.

Disadvantages

* The Province would be rejecting a generally held concern that this existing basis is inadequate.

* Anti-nuclear groups lobbying would be most dissatisfied with a decision not to pursue any changes to the nuclear emergency plan.

* If an accident were to occur which was more severe than the plan basis, public safety would be jeopardized and the province would have failed in its duty to protect life.

OPTION 2

The planning basis take into account more severe accidents which could result in immediate radioactive emissions that could cause early health effects, and the enhanced measures outlined above be implemented within the existing Contiguous zones.

Advantages

* Public safety would be significantly enhanced over the existing situation.

* Scarce resources would be applied in a rationalized and economical manner.

* The choice made is defensible on both technical and pragmatic grounds.

* This position would satisfy and be supported by most interested parties and stakeholders.

Disadvantage

* While anti-nuclear interest groups are likely to feel that the intended measures address many of their concerns, some groups may still view these measures as inadequate.

OPTION 3

The worst credible emission recommended by Provincial Working Group #8 be included in the planning basis and the enhanced measures outlined above be implemented in the area derived from the Working Group's numbers.

Advantages

* Public safety would undoubtedly be enhanced in the areas around nuclear power stations in case of an accident.

Disadvantages

* Considerable expenditure of resources would be required to achieve the required measures and, Ontario Hydro would incur these additional intended costs.

* It would be difficult to justify this large expenditure of resources since the grounds for it are controversial and not fully defensible.

RECOMMENDATION

The Ministry of the Solicitor General and Correctional Services recommends Option 2 which supports the proposed direction outlined above (pages 1 and 2), expanding the technical basis of the Provincial Nuclear Emergency Plan to include more severe accidents beyond the current design basis.

FINANCIAL IMPLICATIONS

In 1988 Ontario Hydro agreed to support 50% of the cost of the nuclear emergency preparedness and planning program, up to a maximum of $500,000. The Ministry of the Solicitor General and Correctional Services currently spends approximately $600,000 each year on the nuclear program in Emergency Planning Ontario. Therefore, approximately $300,000 is returned each year to the Consolidated Revenue Fund for nuclear emergency preparedness by Ontario Hydro.

Ontario Hydro has agreed to bear the costs of an upgraded early warning system for the Contiguous zones around its nuclear facilities. The issue of funding medical arrangements and the Provincial Operation Centre will be dealt with separately when the plans for Acute Radiation Exposure and the new Provincial Operations Centre are finalized.

In addition Ontario Hydro has agreed to work in partnership with Province to upgrade existing plans:

a) Ontario Hydro will pay 100% of the costs of individual projects that have been jointly approved. These costs will be recovered from the funds set aside for the existing cost-sharing agreement. Ontario Hydro will increase the maximum contribution from $500,000 to $600,000 annually for the three years necessary to complete the upgrade. After the 3 year period, general funding will revert to the existing 50% funding arrangement, with a Ontario Hydro cap of $500,000.

b) Ontario Hydro has also agreed to assist affected municipalities with their nuclear emergency upgrade programs by funding projects through a joint approval process involving a partnership of the Province, municipality and Ontario Hydro. This will include a one time total expenditure of $250,000 for capital projects and an available total sum up to $150,000 per year for the maintenance costs associated with municipal nuclear preparedness.

The enhanced levels of nuclear preparedness proposed therefore requires no additional Provincial funding.

WORKFORCE IMPLICATIONS

The implications for the workforce stem from the minor program changes identified in this submission. The opportunity to provide an effective Provincial Nuclear Emergency Plan will extend effective public safety measures and preparedness across Ontario.
Ontario public service employees will require training and education as to their responsibilities for response to a nuclear emergency. An education process as to the contents and procedures of the Provincial Nuclear Emergency Plan should be undertaken. The effective use of the plans once developed requires training for Ministry employees with direct responsibilities as well as an educated awareness of the plans for other ministry employees.

The scope of this impact will also extend to municipalities involved in nuclear emergency planning and preparedness and the details of the Provincial Nuclear Emergency Plan. The initial communications strategy will notify these communities as to contents and availability of copies of the plan. Should any follow-up be required, an information package and contact for consultation will be available through Emergency Planning Ontario. As a result some increased demands for information and training assistance may be placed on this office.

COMMUNICATIONS PLAN

In announcing the new measures, it is recommended that this package acknowledge the support of Ontario Hydro. The new measures will ensure that offsite emergency preparedness is at as high a level as that of the on-site safety systems and procedures.

The communications plan will demonstrate the commitment of the Province of Ontario to safeguard the health, safety, and welfare and property of the citizens in the event of an emergency through the increased measures being proposed.

COMMUNICATIONS ANALYSIS

1. Public and Media Environment

- There is heightened awareness of and concern for nuclear emergency preparedness.

- Media coverage of natural disasters and other emergencies - such as the Hagersville fire - have focused on the preparedness of authorities to react to and deal with these situations.

- Public education in such areas as fire and crime prevention stress the wisdom of preventative actions and readiness as the best means to combat the effects of unwanted events and occurrences.

2. Communications Objectives

- To create an environment of acceptance for the Government's initiatives.

- To facilitate ongoing consultations with the target audiences as the initiatives develop.

- To ensure a timely, co-ordinated and consistent Ministry and Government response to public and media reaction.

- To ensure balanced coverage of key messages.

- To provide positive and helpful follow-up communications with government partners and the general public.

- To facilitate the coordination of inter-ministry and intergovernmental communications and initiatives.

3. Key Messages

- Public safety is of paramount concern to the Government of Ontario and Ontario Hydro.

- Public safety policies, programs, and practices must be responsive to local needs.

- Coordination of expertise and resources is essential to effective nuclear emergency preparedness planning and response.

- The partnership of the Ministry of the Solicitor General and Correctional Services and Ontario Hydro demonstrates their continued leadership and commitment to public safety through the enhancement of the Provincial Nuclear Emergency Plan.

4. Target Audiences

- Ontario Government ministries responsible for emergency planning
- Municipal, county, regional, and municipal governments and officials
- Public safety/emergency response professionals in the above areas
- Residents of the above areas around nuclear facilities
- Emergency Preparedness Canada, Health and Welfare Canada and other federal agencies involved in emergency response
- Association of Municipalities of Ontario
- The general public; media
- Other public safety and emergency preparedness professionals and planners

COMMUNICATIONS PROGRAM

5. Immediate Strategy

- Pre-announcement coordination of information will be extended to Ontario government partners.

- An announcement for reading by the Minister in the Legislature will be prepared. A public announcement will also be developed.

- A media release and backgrounder will be issued to local media.

- Follow-up contact with the Minister will be arranged upon request.

- Regional media will be targeted for interviews.

6. Interministry Coordination

Communications initiatives will be coordinated with the Premier's Office, Cabinet Office, and the ministries.

- Agriculture and Food
- Community and Social Services
- Environment and Energy
- Health
- Municipal Affairs
- Natural Resources
- Northern Development and Mines

In addition, communications with the Ontario ministries of Labour and Transportation, and the Solicitor General Canada will be established and maintained.

7. Evaluation

Media monitoring, ongoing analysis of public inquiries to the Ministry, and assessments of public reaction. Input and correspondence with municipal, county and regional officials, government partners as well as emergency preparedness representatives will also be assessed.