

May 20, 2014

By email: consultation@cnsccsn.gc.ca

Canadian Nuclear Safety Commission
P.O. Box 1046, Station B
280 Slater Street
Ottawa, Ontario, Canada K1P 5S9

Re: Further Comments from Canadian Environmental Law Association Re: Emergency Planning RegDoc 2.10.1

We write to provide further comments with respect to proposed Emergency Planning Regulatory Document 2.10.1.

Introduction:

On April 10, 2014, we received the communication provided to the Consultation list serve of the CNSC that the Commission is finalizing the draft Regulatory Document RegDoc-2.10.1, *Nuclear Emergency Preparedness and Response* (referred to hereafter as RegDoc-2.10.1). The communication outlined the consultation conducted by the CNSC between August and October 2013, and subsequent feedback on comments. CELA provided its comments on the original consultation dated October 18, 2013 (attached again to this letter for convenience).

In the April 10, 2014 communication, the CNSC outlined its proposal to add three additional requirements that were not included in the original consultation, to the RegDoc-2.10.1, applicable to licensees operating reactor facilities greater than 10MW (which would include of course the Darlington, Pickering and Bruce nuclear power generating plants in Ontario and the Pt. Lepreau plant in New Brunswick).

The three items are the subject of these further comments by CELA. The CNSC proposes to include:

- the pre-distribution of iodine thyroid blocking agents to all residences, businesses and institutions within the plume exposure planning zone (sometimes named the primary

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zone or the urgent protective action zone, typically sized at approximately 10 km), and selective pre-distribution in the ingestion planning zone (sometimes named secondary zone or extended planning distance, typically sized at approximately 50 to 80 km)``;

- ``the content of emergency information materials and the distribution of such materials in the plume exposure planning zone, as well as ensuring that emergency plan information is available online to all residents within the ingestion planning zone``;
- The provision of the CNSC and offsite authorities with the technical planning basis for the station`s emergency preparedness and response program.``

The April communication advises that RegDoc-2.10.1 is scheduled to go before the Commission for final approval on August 20 – 21, 2014, and that the final proposed draft will be sent at least 60 days prior to those who participated in the initial round of consultations. We presume that there is proposed language for the final proposal, and must indicate a caveat that the current submission from CELA is prepared without any further detail on the proposed three items other than the three bullets listed above as circulated by the CNSC on April 10, 2014. We therefore may find that upon reading the full amended proposal, we may wish to modify our comments but we will endeavour to provide useful commentary based on what was provided so far. CELA will provide additional comments to each of these three items.

CNSC Jurisdiction and Authority:

Firstly, as a general comment, CELA commends the CNSC for the proposal to add these three items to RegDoc-2.10.1. Their addition, if included in the final proposal, and approved by the Commission in August, 2014, may provide a major level of improvement to the level of emergency preparedness in Canada. Importantly, they could also significantly strengthen the Commission`s ability to assure itself of the state of emergency planning around nuclear power plants in Canada when considering applications for licences for those plants. As CELA noted in our original submission in October 2013 and in prior submissions such as during the Pickering hearing in 2013, this is what the IAEA Guide Standard, *Preparedness and Response for a Nuclear or Radiological Emergency, Series No. GS-R-2*, Safety Standards (Vienna: IAEA, 2002) expects of the national regulator of nuclear power plant licenses. The Commission is the only licensing authority in Canada for these plants as nuclear power plants, and this is an integral factor in licensing. The exercise by the Commission of its authority to review the offsite nuclear emergency plans and to satisfy itself as to their efficacy was also a matter that was the subject of the Fukushima Task Force Report 2011 and the IRSS Report, 2011. We reiterate here our review of these recommendations and the relevant IAEA Standard GS-R-2, edited and updated from our submission to the Pickering hearing in 2013.

The IAEA Standard, *Preparedness and Response for a Nuclear or Radiological Emergency, Series No. GS-R-2*, Safety Standards (Vienna: IAEA, 2002) sets out expectations as to the responsibility of the regulator. It is the regulator`s responsibility, among other things, to do the following (excerpts from GS-R-2 paragraphs 3.8 to 3.12:

- The regulatory body shall require that arrangements for preparedness and response be in place for the on-site area for any practice or source that could necessitate an emergency intervention.
- The regulatory body shall ensure that such emergency arrangements are integrated with those of other response organizations.
- The regulatory body shall ensure that such emergency arrangements provide a reasonable assurance of an effective response, in compliance with these requirements, in the case of a nuclear or radiological emergency.
- The regulatory body shall require that the emergency arrangements “shall be tested in an exercise before the commencement of operation [of a new practice]. There shall thereafter at suitable intervals be exercises of the emergency [arrangements], some of which shall be witnessed by the regulatory body.”
- In fulfilling its statutory obligations, the regulatory body... shall establish, promote or adopt regulations and guides upon which its regulatory actions are based;... shall provide for issuing, amending, suspending or revoking authorizations, subject to any necessary conditions, that are clear and unambiguous and which shall specify (unless elsewhere specified):... the requirements for incident reporting;...and emergency preparedness arrangements.
- In planning for, and in the event of [a nuclear or radiological emergency], the regulatory body shall act as an adviser to the government.
- The regulatory body shall ensure that the co-ordinated arrangements are implemented adequately by the operators.

The Fukushima Task Force 2011 discussed the lack of specific regulatory requirements in Canada for operators for emergency planning and the lack of specific and detailed requirements as well as the lack of sufficient regulatory oversight given the gap in the regulatory framework. (CNSC Fukushima Task Force Report 2011 at 40). CELA concurs with this concern, as in reviewing G-225 “Emergency Planning at Class I Facilities and Uranium Mines and Mills” and RD-353, “Testing the Implementation of Emergency Measures”, we observed that the requirements were too high-level and non-specific to provide useful measures against which the nuclear emergency plans applicable to an accident at a plant could be compared and tested. The Fukushima Task Force reiterated this concern in its chapter reviewing the Canadian nuclear regulatory framework in view of lessons learned from the Fukushima accident. It again stated that the CNSC should require offsite emergency plans to be submitted along with applications to construct or operate nuclear power plants. (At 53). The CNSC’s proposal for RegDoc 2.10.1 will address this issue to the extent that it adds these types of requirements.

The Fukushima Task Force report stated that: “Federal and provincial nuclear emergency planning could be strengthened through establishing a formal, transparent, national-level oversight process for offsite nuclear emergency plans, programs and performance, and through scheduling of regularly planned full-scale exercises.”¹ The IRSS report also noted these

¹ (CNSC Fukushima Task Force Report, CNSC INFO-0824, October 2011 at iv, v)

Fukushima Task Force made recommendations that the CNSC should require the submission (to the CNSC) of the provincial nuclear emergency response plans. The IRSS report encouraged this to be done. (At 58) In the presentation by CNSC at the March, 2013 inter-jurisdictional emergency planning workshop, the responsibility of regulators to ensure emergency response capability and these Fukushima Task Force and IRSS recommendations were also noted. The IRSS report (conducted of CNSC from Nov 26 to Dec 2, 2011) also noted that there are a multiplicity of agencies and levels of government with responsibilities in nuclear emergency planning in Canada and recommended that the CNSC should “verify the requirements and standards described in the offsite emergency plans are met, through tests and assessments.” (at page 59)

CELA submits that even without additional regulatory amendments recommended by the Fukushima Task Force and the IRSS, the CNSC already has jurisdiction to consider the adequacy of the emergency plans in place at nuclear power plants in deciding whether to issue the licence requested, and/or whether to impose additional requirements by way of licence conditions to better protect health, safety and the environment. (Sections 3, 9, 24 of the *Nuclear Safety and Control Act*, S.C., 1997, c. 9) However, the addition of specific requirements by way of a proposal such as RegDoc 2.10.1 will improve the CNSC’s oversight and ability to assure itself of the sufficiency of offsite emergency planning.

CELA again urges that the Fukushima Task Force recommendations for CNSC oversight of the offsite nuclear emergency response plans be pursued forthwith by way of amendment of the CNSC regulations such as RegDoc 2.10.1 and requirements there-under. This particularly includes the recommendation for description of the regulatory requirements to address radioactive hazards during an emergency **in greater detail**. This also includes the recommendation of the Task Force to enhance regulatory oversight with periodic safety reviews and to increase requirements for “requirements and expectations for both design basis and beyond design basis accidents”. (Task Force at v).

As important as the role of the province is in developing their general emergency plans, and their specific nuclear emergency plans, they are not the approval authority for the licensing of nuclear power plants. It is untenable that the content and efficacy of those plans be determined entirely by agencies that are not regulated directly by the CNSC such as EMO, as important as they are in the undertaking of the plans. Constitutionally, the authority over nuclear power plants has, as you know, been definitely declared to be federal by way of the declaration of nuclear power to be for the general advantage of Canada (*Ontario Hydro v Ontario Labour Relations Board* [1993] 3 SCR 327. We have noticed recent correspondence by the EMO to the CNSC objecting to the CNSC’s jurisdiction to set the content of offsite emergency planning and we respectfully submit that they are in error in this submission as this is a matter integral to the operation and licensing

of nuclear power in Canada. Furthermore, as noted it is the CNSC and only the CNSC which has the authority in furtherance of the purposes of the *Nuclear Safety Control Act* in granting licenses. While the EMO has a role, they do not have the jurisdiction over plant licensing, and plant licensing considerations cannot stop at the plant boundary. The Act requires the Commission in licensing assure itself that the licensee:

s. 24(4) (b) will, in carrying on that activity, make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed

It is a red herring that the Ontario cabinet approves the provincial nuclear emergency response plan. If nuclear power plants are to be operated in the province, then all requirements of the national regulator must be met. If these include specific components relevant to offsite protection of the public from effects of accidents at those plants, then the operators must comply, and must demonstrate a reasonable basis to rely on other actors such as EMO to ensure that the level of protection required by the CNSC is in place.

Turning to the specific three additional matters proposed to be added to RegDoc- 2.10.1, we will provide more specific submissions in respect of each one.

1. Pre-distribution of iodine thyroid blocking agents to all residences, businesses and institutions within the plume exposure planning zone, and selective pre-distribution in the ingestion planning zone.

(i) Predistribution within the Primary Zone:

CELA supports pre-distribution of iodine. In addition to predistribution within the Primary Zone, CELA submits that the selective pre-distribution in the ingestion planning zone should include in the case of Durham region, the geographical area between the Pickering and the Darlington nuclear generating plants that are outside of 10 kilometers, but between two plants. (We also submit that the plume exposure planning zone or “primary zone” should be expanded as per our prior submissions in the Darlington and Pickering licensing hearings in 2011, 2012 and 2013.)

We repeat here many of the submissions we made following our thorough review of the state of emergency planning during the Pickering 2013 licensing hearing, which includes a summary of some of the key documents and rationale pertaining to the issue of Potassium Iodide (KI) (referred to above in the CNSC proposal as “thyroid blocking agents”). The following is edited for the current context as submissions respecting proposed RegDoc-2.10.1.

Potassium Iodide (KI) is important because its ingestion helps to block uptake of radioactive iodine in case of a severe offsite accident. Radioactive iodines are among the earliest radionuclides emitted from a nuclear power plant in case of breach of containment or in controlled venting following an accident. Emergency response to protect against radioactive

iodine is needed since iodine “concentrates in the thyroid gland... a quarter of all ingested iodine goes to the thyroid under normal circumstances. As a result, when iodine is ingested the thyroid receives a very large dose compared to the rest of the body (roughly 1000 times as much)”². Health Canada states that: “Once in the bloodstream, about 20% of the iodine is absorbed by the thyroid.... It is particularly susceptible to beta and gamma irradiation from radioisotopes of iodine, especially I-131.” (Health Canada Guidelines for Intervention During a Nuclear Emergency, 2003 at 21).

The ICRP notes that Iodine Thyroid Blocking is primarily intended as a short term measure to reduce uptake of radioiodines by the thyroid from inhalation over a few days. The prevention of uptake by ingestion should primarily be accomplished by controlling foodstuffs, milk and water that may be contaminated. (ICRP Publication 109 at 65). IAEA Guide GS-G-2.1 states that radioiodine uptake by the thyroid gland following an accident can be reduced by taking stable (non-radioactive) iodine. It outlines that “to achieve maximum effectiveness, stable iodine must be administered before or soon after the intake of radioiodine. The effectiveness of the measure decreases rapidly with delay, and can be reduced to 50% or less if administered 6 hours after a single intake of radioactive iodine.” (at Appendix V, V.15) The IAEA Guide states that its reduction of dose is only 20% 10 hours after the intake of radioiodine and almost zero 24 hours after. (Ibid, V.15) ICRP publication 109 reinforces this – if stable iodine is taken up to 6 hours **before** the intake of radioactive iodine, “the protection provided is almost complete”; if at the time of radioiodine inhalation, its effectiveness is 90%; and 50% within a few hours. The ICRP stated that “to obtain the maximum reduction of the radiation dose to the thyroid, stable iodine should be administered **before** any intake of radioiodine or **as soon as practicable thereafter.**” (At 65.) (emphasis added)

As long ago as 1984, the province of Ontario’s Working Group #2 to the Ontario Nuclear Emergency Plan (established by the Solicitor General to make recommendations on the use of stable iodine in case of a nuclear emergency) recommended pre-distribution of KI because it must be ingested very early in or prior to a release from an accident in order to be effective. The Working Group #2 also reviewed the reasons for ingestion of KI for thyroid blocking as a significant preventive measure for public health to prevent early thyroid injury or longer term thyroid cancer risks. The Working Group stated that “The Group recognized that the cost-

² Working Group #8, 1988 at 4; see also IAEA Guide GS-G-2.1 at V.17 which states that “The thyroid gland absorbs and concentrates iodine once it has been inhaled or ingested; thus the potential exists for large thyroid doses following the occurrence of severe core damage at a large reactor. A large dose to the thyroid can result in deterministic effects in the thyroid gland and radiation induced thyroid cancer. In the event of **actual or possible** core damage, stable iodine prophylaxis should therefore be used: to prevent deterministic effects in the thyroid gland (e.g. hypothyroidism; to reasonably reduce the risk of stochastic effects (e.g. radiation induced thyroid cancer) from the inhalation of radioiodine within or near the facility.” (emphasis added).

benefit ration was high, but that it would be prudent to consider pre-distribution.” (at Recommendation #3) Provincial Working Group #2 also stated in 1984 stated that “if there is any use at all by KI as a blocking agent it would have to be by pre-distribution to an area considered to be at risk.” – this was based on the time frame in which KI must be taken to be effective, and that if the warning time available before release is as little as thirty minutes, then “that will not be sufficient for house-to-house distribution from a central stockpile.” (At 6).

CELA submits that KI MUST be pre-distributed because it must be ingested before or shortly after a radioactive release, and if necessary during a release³. It would not be reasonably feasible to quickly obtain KI after such a severe accident that requires ingestion of potassium iodide. In that scenario people will likely be required to shelter in place and/or evacuate so it will not be possible to attend pharmacies to obtain it, nor would it be practical to have extensive distribution at that time.⁴ In any event there is no possibility this could happen on time for the affected population numbers if there was not adequate pre-distribution. The IAEA Guide GS-G-2.1 stresses that other organs (bone marrow, lungs and other organs) are not protected by KI and therefore “sheltering or evacuation of people at risk of life threatening doses should not be delayed for the provision of stable iodine prophylaxis.” (at V.21)

There is a further concern about the adequacy of KI availability. This is highlighted by comparing the numbers of KI pills available. During the Pickering hearing, the CNSC staff submission noted that there is an inventory of 325,000 potassium iodide tablets for residents of the 10 km zone around Pickering (page 62 of the CNSC's submission CMD 13-H2.) This compares to the population of approximately 260,000 in the 10 km zone⁵ but does not take account of the potential necessity for repeat doses nor for provision beyond the 10 km primary zone to the high populations in Scarborough and Pickering in the event of an offsite emergency requiring broader KI distribution.

We have compared the lack of a comprehensive KI pre-distribution approach in Ontario to the approach taken by France as described by J.C. Niel⁶, in Ottawa during remarks made on April 10, 2013 during a session on Emergency Management. He stated that the approach taken by

³ IAEA Guide GS-G-2.1 at V.19; See also Working Group #8, 1988 at 6.

⁴ See also Working Group #8 Report 1988 where it notes that Emergency Planning Ontario considered the lower Protection Action Level for thyroid blocking to be “only for advising persons already in possession of potassium iodide pills to ingest them.” (at 19)

⁵ DRNERP 2011 and TNEP 2012 sources for total population numbers within 10 km of the Pickering NGS.

⁶ J.C. Niel, of the Autorite' de surete' Nucle'aire (ASN) at the IAEA International Conference on Effective Nuclear Regulatory Systems hosted by the CNSC in Ottawa, April 8-12, 2013.

France for KI distribution had been first to mail all of the residents in the protective action zone coupons to redeem at local pharmacies for KI for the household, at no charge. After finding that the uptake was insufficient, they then mailed every single household the KI doses needed to ensure that they would have them on hand in the event of a severe accident. CELA submits that based on testimony heard by the Commission at several recent licensing hearings, it is obvious that there is a similar lack of awareness and lack of uptake of KI by households in advance of a potential accident and therefore pre-distribution is the only reasonable approach.

The CNSC Fukushima Task Force Report, 2011 also noted that the effectiveness of the approach of stocking the KI tablets at local pharmacies, as opposed to pre-distribution to all households “has not been confirmed.” (at 52) It is notable that the CNSC 2011 Fukushima Task Force reported that Ontario is the only nuclear province in Canada that does not pre-distribute KI to the residents in the surrounding planning zones. (at 47)

CELA supports the proposal that the CNSC require and ensure 100% pre-distribution of KI tablets to the residents in the Primary Zone, as well as institutions and businesses and that this requirement be included in the licensing conditions for each of the nuclear generating stations in Canada.

(ii) Selective Pre-Distribution in the Ingestion Planning Zone and Population Growth:

Furthermore, CELA recommends that all residents of the area between the Pickering and Darlington nuclear power plants in Ontario be included in pre-distribution of KI, even if outside of the current 10 km primary zone. These residents are at increased risk of exposure from an accident with offsite consequences by virtue of being resident in close proximity to two sets of NPP units. The necessity for this recommendation is further indicated by the inclusion of Durham Region in the province of Ontario’s Places to Grow targets for increased density of populations therein, and the City of Pickering’s plans for increased density by way of Official Plan amendments. See for further details the excellent letter written by Ms. Barbara Pulst to Ontario’s Ministers of Infrastructure and Community Safety on May 2, 2014, and included here with her permission. Additionally, OPG commented at the recent hearing to remove the Hold Point at Pickering, in response to a question about their recent submissions to the Ontario Energy Board seeking resources for a research project, that there is the possibility of operating the plant for a longer time frame than has even been contemplated in recent CNSC licensing applications. (See CNSC Public Hearing Pickering Hold Point May 7, 2014 Edocs # 4433743 transcript – pages 134-136). In any event, the expectation that the Pickering plant may close in a few years is not a valid argument to avoid the costs of KI pre-distribution in this larger area, since the corollary is that it is an aging plant, with all of the technical and performance issues that entails. From the perspective of the public, the necessity of KI pre-distribution is as important as ever,

during every year of operation, and potentially more-so in the latter years of the plant's operations.

(iii) **Access to KI pills by residents beyond the 10 km zone.**

During the recent hearing regarding removal of the Pickering holdpoint, CNSC staff (per Mr. Santini) stated that in the proposal for the amended RegDoc 2.10.1, licensees will also be required to ensure that sufficient stocking of KI pills for residents beyond the 10 km zone is provided⁷. CELA supports this, in addition to pre-distribution, and in addition to our recommendation for automatic pre-distribution in the zone between Pickering and Darlington in particular. CELA submits that the RegDoc must also require that information as to where these KI pills can be obtained, and clear direction to pharmacists to release them on request (as opposed to seeking proof of residency within the 10 km zone) must be provided and widely communicated to the public.

2. **The content of emergency information materials and the distribution of such materials in the plume exposure planning zone, as well as ensuring that emergency plan information is available online to all residents within the ingestion planning zone.**

CELA supports this addition to the RegDoc and recommends that the CNSC specify minimum content for the emergency information materials that are to be distributed and posted. CELA also submits that the CNSC should require demonstration of the effectiveness of the information program, and its reach, with verifiable objective measures to show the level of awareness of the general public as to what they would have to do in an emergency. Very basic information is required especially in the case of the Ontario plants, in all of Durham Region and a large portion of the City of Toronto where recent license hearings have demonstrated the general lack of availability of information for the public. For the Bruce and Pt. Lepreau plants, the situation may be similar (CELA will be examining the general state of emergency planning preparedness and compliance for the next Bruce licensing hearing with the assistance again of funding from the CNSC's funding panel). There has been a recent initiative by OPG to distribute a "flashlight" brochure with basic information in a format that has a better likelihood that it will be retained by home-owners. However, the level of awareness and state of knowledge by the general public is so lacking that it will take repeated and concerted efforts at outreach, public education, training, and communications to ensure that the residents of these areas around the OPG plants are sufficiently informed. In addition, this brochure is only the beginning and much more information needs to be disseminated. For example more details on decontamination; on sheltering efficacy; on specifics around family reunification; on transportation when there is no personal transportation, and many other practical examples require extensive public education for residents living in the vicinity of Canada's nuclear power plants. Furthermore, most communications efforts by the plant operators have been to communicate their perspective that

⁷ (see CNSC Edocs # 4433743, transcript May 7, 2014 at page 68).

the plants are safe and it is therefore difficult, we predict, to have the public take in the message about the necessity of awareness about nuclear emergency planning. Given the decades of operation by these plants in these communities, this is a striking state of affairs and it is therefore evident that the CNSC as regulator must assume oversight on this topic for the sake of protection of the public from potential accidents at the plants. As the Japanese regulator attending the IAEA Regulator's conference in Ottawa stated last year, the lack of emergency readiness was a significant factor in the extent to which the public was affected by the Fukushima accident.⁸ An informed, well-educated public residing in the vicinity of operating nuclear power plants is essential. We repeat here, in edited form, the submissions we made on this topic during last year's Pickering hearings:

To this point in time, it has been a matter of significant concern as to the extent to which the public for example in both Durham Region and the City of Toronto have been unaware of, and not engaged in providing input to the content of the nuclear emergency plans. This in itself increases the risks and potential consequences from a severe offsite accident at a nuclear power plant. During the recent Pickering and Darlington licensing processes, for example, it was evident that many residents of Durham region were unaware of provisions in the Nuclear Emergency Response Plan that anticipate that they will find their own accommodation with friends and family in case of evacuation; that they may be asked to "self-decontaminate" in some scenarios, and what that means; that KI is effective only if taken before or immediately upon commencement of a release; they were unaware of the transportation plans that would be available if they do not have their own vehicles; and they were concerned about family reunification in the event of evacuation scenarios in which members of their family are evacuated separately from the family such as from schools and long term care institutions.

IAEA Publication "Lessons Learned from the Response to Radiation Emergencies (1945 – 2010), (IAEA, August 2012) includes a comment in the chapter "providing information and issuing instructions and warnings to the public", about the importance of providing information to the public on protective actions to be taken in event of an emergency in **advance** of any emergency for threats such as Nuclear Power Plants. They stated that "This will engender confidence – the knowledge that the officials have their interest at heart – and, by doing so, improve compliance with protective action recommendations in the event of a real emergency. In addition, there will be a better understanding of the systems used to warn them of an

⁸ The attitude in which lower levels of preparedness have until this point been accepted in Ontario is reminiscent of that described at an IAEA Regulator's Conference hosted by the CNSC in Ottawa in April 2013, at which Toshimitsu Homma of the Japan Atomic Energy Agency stated in a Conference Panel on Emergency Management that the most important lesson of Fukushima was that before the accident, "There was an implicit assumption that such a severe accident could not happen and thus insufficient attention was paid to such an accident by authorities."⁸

emergency.” (At 27) This requirement is reinforced by the comment in ICRP Publication 109⁹ which recommends engagement with stakeholders and discussions of the plans, including with members of the public. The rationale is that “Otherwise, it will be difficult to implement the plan effectively during the response. The overall protection strategy and its constituent individual protective measures should have been worked through with all those potentially exposed or affected, so that time and resources do not need to be expended during the emergency exposure situation itself in persuading people that this is the optimum response.” (at 42)

CELA agrees with these assessments but we have not seen a sufficient level of advance communication with the public in the 10 km zone and beyond, around at least the Pickering and Darlington NGS’s, both within the Region of Durham and within the City of Toronto, to feel confident that people sufficiently understand the protective actions to be taken in the event of a nuclear generating station emergency. The recent distribution of the “flashlight” brochure is positive, but this will not be sufficient. CELA supports the CNSC in requiring extensive public engagement to be undertaken by licensees as a condition of operating licences of the Nuclear Generating Stations, to include detailed specific explanation of the protective actions that may be required, why, how they would be communicated and in what eventualities. In particular, CELA supports this addition to the RegDoc-2.10.1, provided the Commission includes an outline of detailed minimum content and expectations for public communications and its efficacy in terms of improving public safety and preventing harm to members of the public in the event of an accident.

3. The provision of the CNSC and offsite authorities with the technical planning basis for the station’s emergency preparedness and response program.

This requirement would be a significant improvement to RegDoc- 2.10.1. CELA submits that after obtaining the technical planning basis for the various Nuclear power generating stations’ emergency preparedness and response programs, the next step will be to evaluate its suitability, and if necessary (as we submit is likely), to require improvements to the planning basis, i.e. to assure that more severe accidents such as multi-unit accidents as occurred at Fukushima, or severe catastrophic offsite releases as occurred at Chernobyl and Fukushima are part of the offsite emergency planning basis. This discussion must engage the public. In particular, given that CNSC staff stated during the May 2014 hearing on removal of the Pickering Hold-Point, that this would include provision of release and source term information, we submit that members of the surrounding community and public interest organizations such as CELA must be engaged in the discussion as to the appropriate planning basis. As we submitted during our comments on the recent Pickering and Darlington licensing hearings, it was obvious from the

⁹ International Commission on Radiological Protection, “Application of the Commission’s Recommendations for the Protection of People in Emergency Exposure Situations”, (ICRP Publication 109, 2008)

documentation that the planning basis was a much smaller accident – at least in Ontario in the 2009 plan it was based on assumptions that radiation doses would not be over 250 mSv at the plant boundary, for example. The 2012 plan stated that with low probability, an accident could occur “which could result in a more severe offsite effect.” The 2012 premise was a significant improvement over the 2009 plan, but on the ground detailed planning is not yet in place to respond to a catastrophic type accident. The CNSC should assume regulatory oversight over this issue in RegDoc 2.10.1 in terms of assuring itself BOTH that a sufficiently large accident is utilized as the planning basis for emergency planning AND that the emergency plans themselves are sufficiently detailed that there is a realistic prospect that such a large accident would meet a robust emergency response that would significantly reduce harm to people offsite. In our submission this includes evaluating the sufficiency and particularity of the public notification, evacuation planning, KI pre-distribution, decontamination, medical response and all of the other details of the plan. CELA strenuously submits that the response that the CNSC has been provided to date (that in Ontario at least) that the province’s plans “are sufficiently flexible” to respond to a larger accident should be wholly unacceptable to the Commission. CELA is hopeful that the large offsite accident exercise that is planned for the end of this month will provide more information as to the extent to which the existing plans would be responsive, but urges the commission to demand strenuous demonstration of the efficacy of the offsite emergency plans to respond to large offsite emergencies as a routine condition of all licensing of nuclear power plants going forward. Given that the forthcoming exercise will not result in actual notification to hundreds of thousands of people, nor actual advice to ingest KI, nor actual advice to shelter, nor actual evacuation of those same numbers of people, there must be surrogates to establish confidence in the plans. The exercise (which is absolutely necessary) must be supplemented with other mechanisms to demonstrate sufficiency and efficacy of the plans and we submit that one measure of this is that there is sufficient detail in the planning for the Commission to be more assured that it would be sufficiently responsive. For example, the Commission being told the plans are “flexible enough” to respond does not provide a strong basis for the Commission members to have confidence in the emergency planning. Again as earlier submitted it is the Commission itself which must be satisfied under the NSCA that the public will be protected in the event of an accident.

Although CELA has a much more extensive treatment in our prior submissions, as to the background pertaining to the planning basis, we here repeat the portion of our prior submission dealing with the current state of planning readiness in Durham region, and reference therein the Fukushima Task Force and IRSS recommendations that support this addition to the RegDoc. We would also add that despite recent references by witnesses in various Commission hearing processes to “work that is underway” on these topics, there is no public documentary information available as to what improvements will be made to the requirements for emergency planning other than the present consultation (and the CSA consultation that was temporarily available to the public last August, but is not now available despite requests to the CSA.) We should also add that CELA and Greenpeace were invited to present our recommendations from the Pickering hearing on emergency planning and planning basis to the inter-jurisdictional committee on nuclear emergency planning in Ontario. This was appreciated, but it was a one-way exercise wherein we outlined again a high level overview of our findings and recommendations but we have not yet been engaged by the planning authorities in any discussion on the planning basis or any other concrete changes to the regulatory requirements or to the offsite plans themselves.

Accordingly the following remains the state of the public record in this respect regarding the planning basis, and our concerns remain relevant.

The IAEA's Integrated Regulatory Review Service (IRRS) report post Fukushima (November – December 2011) called on the CNSC to do a “national assessment of nuclear power plant off-site emergency plan that includes all relevant organizations”. (at page 10) It made a specific recommendation: “**The Government of Canada should assure** that the review and assessment of off-site emergency plans for nuclear power plants includes all relevant authorities, are comprehensive, and that the relevant organizations which implement those plans are capable of performing the assigned duties.” (IRSS at Recommendation RF7). (emphasis added)

The level of detail of emergency planning and preparedness is a significant issue. CELA submits that the CNSC must ensure a level of detail with specified time frames, tested and verified, to respond to large offsite severe accidents. CELA submits that the current level of planning in Ontario beyond the 10 km zone has hardly exceeded what Commissioner Hare in 1988 called “a conceptual framework” that would “enable a response to be improvised should an emergency occur before all preparations are complete.” (Hare, Vol. 1, 1988, p. 230)¹⁰ The CNSC Fukushima Task Force, 2011, confirmed that the PNERP, 2009 is “based on a single-unit accident and does not consider multi-unit accidents.” (At 45.) The issue of the adequacy of the current emergency planning basis in Ontario was briefly discussed on December 3, 2012 hearings before the CNSC on the Darlington refurbishment application, when a witness¹¹ from Emergency Measures Ontario discussed their desire to have “a greater inclusivity of events beyond the normal planning horizon”. Although they indicated they were satisfied with the responses provided by CNSC staff prior to that hearing in response to a letter¹² they had

¹⁰ The Working Group #3 report (1984) is explicitly referenced in PNERP, 2012 as the basis for selection of Protection Action Levels. That report was described in the Working Group # 8 report (1988) as background that had been conducted pre-Chernobyl. They stated that Working Group #3 recommended that “in the case of accidents which were in fact more severe than the MPA {Maximum Planning Accident}, authorities should be able to cope by improvising on the plans which would already be in existence based on the MPA.” The MPA was recommended to be one that “gives a dose to an unsheltered person 1 km from the nuclear station (that is, the assumed boundary fence). The 25 rem {250 mSv} was stated to be based on the assumption of good engineering practice and the operating experience to that time, together with the particular properties of CANDU reactors, especially that the moderator could act as an additional heat sink in case of failure of both the normal and the emergency cooling systems (and so prevent severe core damage), and the belief that detailed planning was unnecessary for events of probability less than once per million reactor years in situations where there are about 10 reactors per power station.” (Working Group #8 at 8-9, describing Working Group #3's recommendations).

¹¹ Alison Stuart, ADM and Chief EMO, December 3, 2012, Darlington Refurbishment Hearing before the CNSC

¹² The letter is attached to CMD 12-H13.A in the Darlington Refurbishment and Continued Operations EA CNSC hearing.

submitted to the CNSC, they also recognized “this isn’t the last time we will be sitting here” and it was not the only opportunity they would have to continue to push what EMO thinks is really important regarding emergency management in terms of how to plan and how to exercise and how to modify the nuclear emergency plans going forward. In response to a question by the CNSC President about what EMO would be able to do by 2014 for the refurbishment continued operations licence, the witness further stated that they are in a process of evolution – and would want to present a provincial position that represents various aspects of planning that goes well beyond traditional planning scenarios. She commented that they would be working with all partners in that expanded view of the world. She looked forward to being able to speak to that at subsequent hearings and being able to identify any areas of concern as well as hopefully areas of significant progress. CELA submits that the CNSC commissioners must demand details of the offsite emergency planning basis and independently assess its sufficiency in licensing applications.

Contrasted with the Ontario PNERP, 2009, the PNERP, 2012 states that, with low probability, an accident could occur “which could result in a more severe offsite effect.” It is defined as one or more of: i) the time between the accident and release of radioactivity may be generally limited {also sometimes described in other regulatory and industry documents as “early release”}; ii) radiation doses could be high, greater than 250 mSv at the plant boundary; iii) radioiodines and particulates could form a component of the radioactive emission; iv) environmental contamination could be significant; v) area affected could be larger than for the basic offsite effect. (At 2.3.3 (d)). For these more severe but less probable accidents, the province outlines a limited number of issues for which to undertake preparedness: “ i) timely public alerting and direction; ii) prioritizing evacuations for those closest to the hazard; iii) radiation monitoring and if necessary, decontamination; if needed, medical assessment, treatment and counselling.” (At 2.3.3.(e)) The PNERP states that the detailed planning and preparedness “will establish an effective basis to deal with an emergency caused by any type of nuclear installation accident.” Despite this provision, CELA is concerned that detailed planning is not yet in place for a very severe catastrophic accident. During our reviews for the Darlington and Pickering hearings, it was evident that the level of planning was more consistent with the prior PNERP 2009 and the traditional, smaller accident it outlined. And while some of those who intervened in these hearings (Canadian Environmental Law Association, Durham Nuclear Awareness, and Greenpeace) have had assurances by the province that the planning basis is under examination, we have not yet been provided any further information or been asked for input. For example, the inability to assess the extent to which the province and emergency responders are prepared to deal with medical assessment and treatment because of the lack of available Radiation Health Plans is one indicator that the province still does not have that capability in place. We should note that even now, in May 2014, the province’s Radiation Health Plan has not yet been made public.

CELA has not yet seen evidence that more severe, beyond design basis severe accidents, initiated by a variety of severe external events such as hostile action, extreme weather events and others have been considered in Ontario as a basis for emergency planning¹³. Similarly, CELA has not seen evidence that the consequences of multi-unit events have been considered in Ontario as a basis for emergency planning. To the contrary, the CNSC Fukushima Task Force Report 2011 stated that none of the nuclear power plant operators in Canada had at that time considered “multi-unit accident scenarios in development of their emergency plans”. (at 37) The Task Force stated that it was confident that the operators could respond to a beyond design basis accident “**provided they are single-unit accidents only.**” (at 37, emphasis added). While there have been indications that the exercise planned for the end of May, 2014 will represent a multi-unit accident, no details have been made public.

CNSC should require multi-unit severe accident planning to be demonstrated by licensees, along with the effectiveness of off-site emergency response in such a case. Similarly, CNSC should ensure, contrary to previous practice, that extreme natural hazard initiated events and “gross human error” are also examined in terms of presenting an emergency planning basis, and that the on-site and off-site emergency preparedness and planning are demonstrated to be sufficient and reliable to respond to all of these undesirable scenarios in the event that they lead to severe offsite releases.

A related concern is that raised by the Fukushima Task Force Report (2011) that the licensee can perform “post-accident source term estimation” – however “these are designed for **an accident in only one unit.**” (emphasis added) (At 38). As the Task Force noted, this is important information to be able to provide to offsite authorities in the case of a nuclear accident. CELA recommends that this post-accident source term information be required by the CNSC as a condition of licensing and that the CNSC require OPG to upgrade their capacity to provide source term information and its basis, for multi-unit accidents, as a condition of licensing. This should include reassessment of plume and dose modelling for multi-unit accidents at the Nuclear Generating Stations (see Task Force Report at 38).

For severe accident emergency planning, twenty-five years after the Hare commission, CELA is of the view that Ontario still only has a “conceptual framework” allowing for “improvisation” in the event of a catastrophic accident at Ontario nuclear power plants, including the Pickering NGS (what the EMO witnesses called “flexibility” in the recent hearings.) Despite all of the recommendations, Commissions, and world-wide accident experience that would suggest that planning for more severe accidents is required, post Fukushima there has been some discussion

¹³ Even consideration for Severe Accident Management (i.e. on site response) was not adequately considered, analyzed, nor incorporated into licensing requirements in Canada pre-Fukushima. See Fukushima Task Force, CNSC INFO-0824, October 2011 at 35.

about increasing the basis for accident planning, and recommendations to do so, but changes in the Plans, in emergency preparedness on the ground, and in details of planning are not yet evident or proven. CELA recommends to this Commission that now is the time to end the situation of operating the nuclear power plants without sufficient detailed emergency planning for large scale catastrophic accidents in place.

In terms of a planning basis, in RegDoc 2.10.1 CELA recommends that the CNSC should require the licensees to demonstrate that there are, in place, properly resourced, sufficiently detailed emergency and preparedness plans that would address Chernobyl-size accidents or Fukushima-size accidents. The basis for this recommendation includes world-wide experience with these catastrophic accidents. This recommendation is independent of particular event sequences and rather takes account of the myriad ways that things that can go wrong resulting in an accident and resulting in a serious breach of containment, regardless of how caused. It also includes consideration of the fact that among the events that may initiate a catastrophe at a CANDU are those that are beyond the control of the operator such as hostile action or unforeseen external weather events or unforeseen combinations of failures including human error. There is no policy justification for excluding these types of events from emergency planning and preparedness since it is amply demonstrated (Three Mile Island, Chernobyl, Fukushima, 9/11) that all of them may occur in the real world, with disastrous consequences.¹⁴

RegDoc 2.10.1 should provide that licences will not be granted by the CNSC without demonstration of not only the planning basis, but the sufficiency of the planning basis, and the ability of the relevant emergency offsite planning to actually respond to severe offsite accidents with large releases and prevent and reduce harm from those accidents are actually in place and demonstrated to the regulator, with evidence, to be effective. CELA also submits that it is critical that this evidence be made public. Members of the surrounding communities must be

¹⁴¹⁴¹⁴ CELA notes that the Working Group #8 Report included a concept of Worst Credible Radiation Emission in its 1988 report, which it described as “the very worst that could happen: the maximum effects possible from any accident, however caused or however developed” and that it would thus encompass accidents including those that could not be calculated due to lack of quantifiable data as well as those with very low probabilities. For this accident that the Working Group #8 styled “WCRE”, it recommended that planning be done to prevent “the worst consequences” of this type of accident; namely early morbidity or mortality. Their rationale was that the most severe consequences are “extreme enough to warrant consideration in planning” “however remote their likelihood.” Working Group #8 also based this recommendation in part on the fact that provincial and other authorities, when interviewed at this time (1988), were of the view that their ability to “improvise” for such a severe accident would begin after 24 hours, but “immediate and effective improvisation was not thought to be possible” before 24 hours in the case of a larger than anticipated event. (At 28.) The Working Group decided that “in general no probability could be associated with the WCRE... it represents the bounding case which subsumes all events, however low their probability.” (At 62.) The WCRE would result from the “failure of a large number of fuel elements in a short period of time, with a simultaneous breach of containment.”

able to understand what is in place; how effective it is; what has changed; and on what basis the regulator is judging the emergency plans to be in place.

We trust that the foregoing is of assistance, and we ask that we continue to be advised and engaged in the development of RegDoc 2.10.1 and its subsequent consideration by the Commission.

Yours very truly,

A handwritten signature in black ink, appearing to read 'T. McClenaghan', enclosed in a simple rectangular box.

Theresa A. McClenaghan
Executive Director and Counsel

Encl:

Letter from B. Pulst to Ontario Ministers of Community Safety and Infrastructure, May 2, 2014
Letter from CELA to CNSC Consultations dated October 18, 2013