



**Emergency Planning in
Darlington Refurbishment**

EA

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Context for CELA's July 18 2012 submission to CNSc

- OPG is seeking approval to refurbish four nuclear reactors at the Darlington generating station
- The CNSC licence applications (for a licence to prepare the site and for a licence to construct) triggered a federal environmental assessment
- The EA has proceeded as a “screening” to date, with the CNSC planning on a hearing now scheduled for November 13 and 14 2012 in Courtice, along with the Licence hearing

Context for examining emergency planning

- The CNSC released a Draft Screening Report and called for public comment by July 2012
- CELA decided to focus its examination on the extent to which the Draft Screening Report addressed emergency planning from a refurbished Darlington NGS
- Durham Nuclear Awareness also asked CELA to provide comments on its behalf on this topic pending release of the final screening report
- CELA had earlier provided comments on the Draft Scoping Report for this project

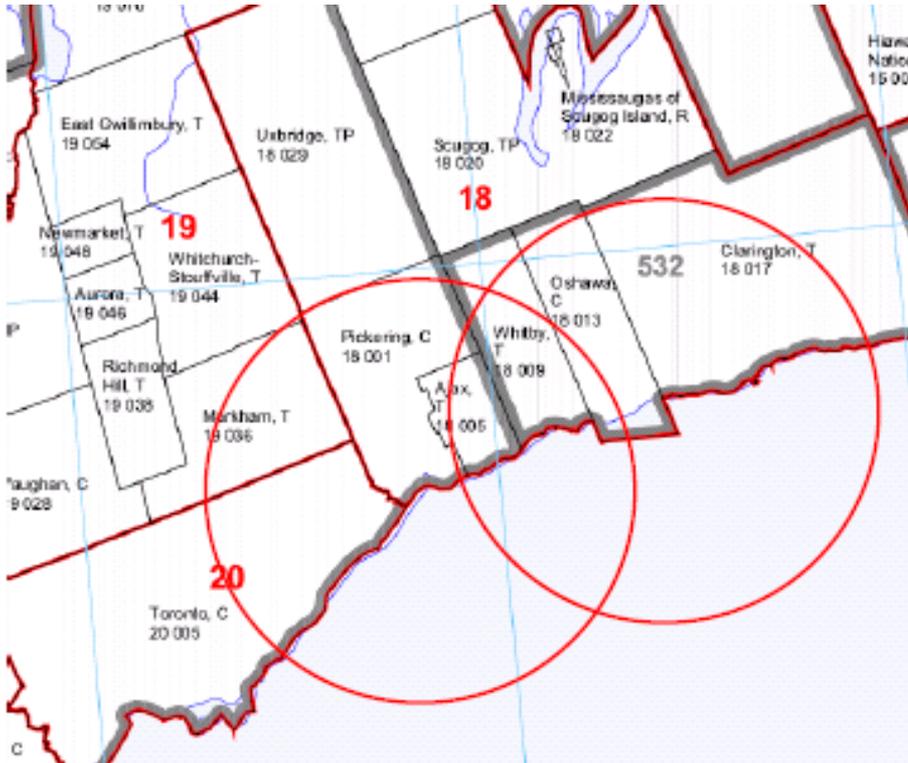
Methodology

- CELA's review proceeded by way of an outline of the issues of most relevance to the surrounding community in relation to emergency planning (see July 18 report table of contents)
- CELA then examined the Draft Screening Report to determine whether each of the issues was addressed
- CELA further examined other available information regarding emergency planning for the Darlington NGS

Conclusions

- There is very little treatment of the topic of emergency planning in the Draft Screening Report
- This is despite the fact that the Scoping Document required this topic to be addressed in the EA
- CELA's July 18, 2012 report is addressed to CNSC with an extensive list of issues which should be explicitly reviewed and considered by the CNSC in both the EA and licensing decisions on the refurbishment

Emergency Planning: Relevance



- A nuclear accident at the Pickering site requiring a 1 year evacuation from the 20 km zone would prevent \$56 billion of economic production (in constant 2002 dollars).

- A Pickering accident would force the relocation of 1.3 million people with combined annual incomes totaling \$44 billion.

- A similar accident at Darlington would prevent \$10 billion of production.

- A Darlington accident would dislocate 477,000 people with incomes of \$18 billion.

- (Slide Courtesy of Greenpeace Canada)

Who is Responsible for What

- See Appendix B in the CELA submission for excerpt of Federal Plan Departmental functions – Health Canada, CNSC etc.
- Provincial Nuclear Response Plan 2009 – Premier, Cabinet and Emergency Management Ontario
- Durham Region Nuclear Emergency Response Plan 2011 (Part of Durham Region Emergency Master Plan) with Appendices

History of Emergency Planning in Ontario

- Reviews happened after TMI and Chernobyl
- Ontario Nuclear Safety Review 1988
- Working Group 8 1988 on “The Upper Limit for Detailed Nuclear Emergency Planning”
- Royal Society Report 1986 commissioned by Ministry of Energy and Environment, Ontario
- Subsequent reduction of size of accident from 10^{-7} to 10^{-6}
- Removal of planning for worst possible accident
- Less access to information as to the hazard

Current Emergency Planning Zones

(from Ontario Provincial Nuclear Emergency Response Plan)



Exclusion Zone is the onsite area inside the station boundary (approximately 1 km)
(Darlington NGS pop = 1,400)

Contiguous Zone is the off-site area immediately surrounding Darlington NGS where an increased level of preparedness and response is required (normally approximately 3-4 km). (Darlington area pop.=1,500)

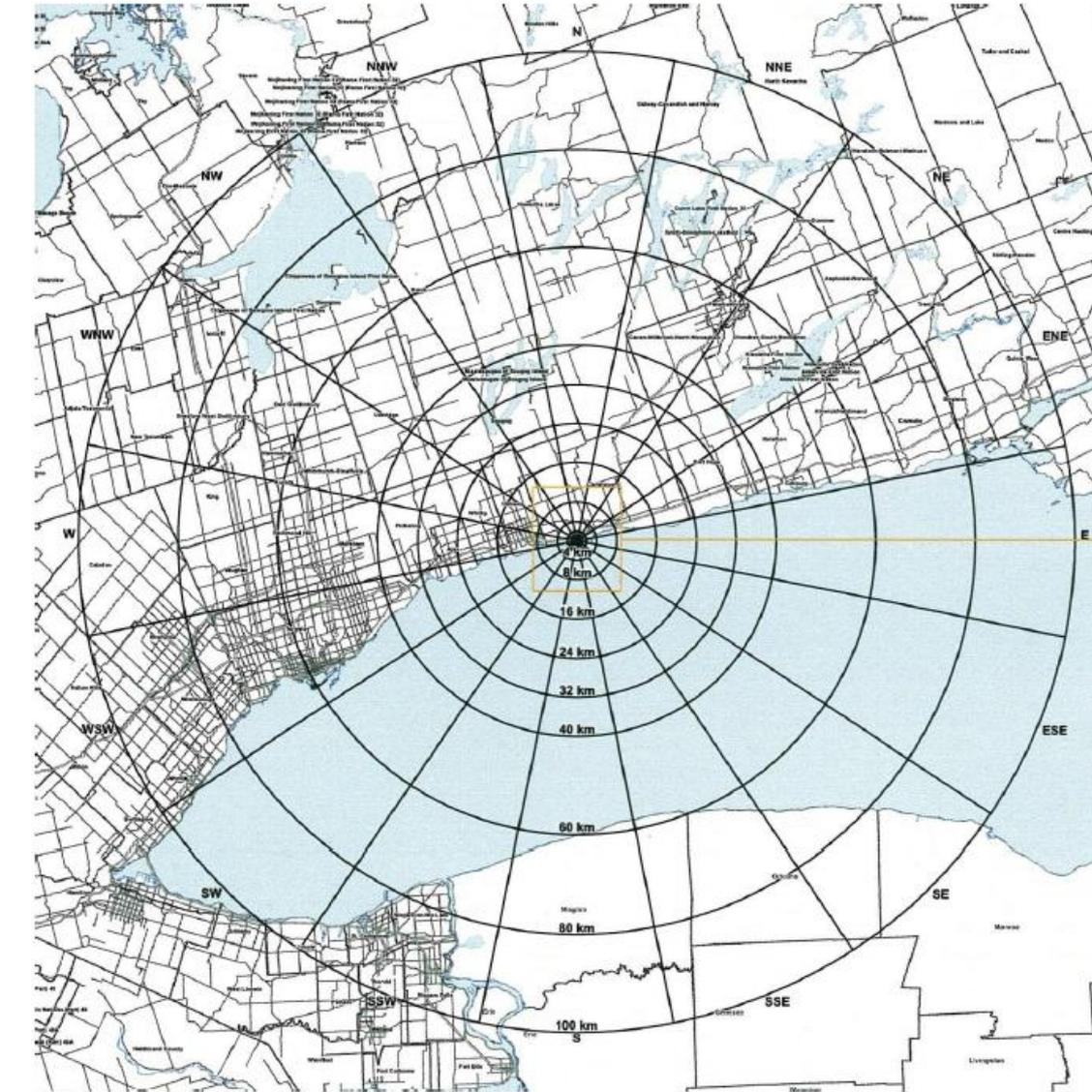
Primary Zone is the area around Darlington NGS where exposure control measures may be required (Darlington area pop.=118,000)

Secondary Zone is the area where ingestion control measures may be required (50-80 km, depending on facility).

Evacuation Time Estimates (ETEs)

- OPG says it would take 9 hours to evacuate the 10 km zone around Darlington in 2025
- Some evaluation was done of time for “shadow evacuation” of people voluntarily leaving the area beyond the 10 km zone; but not re capacity to handle evacuees beyond this limit (as per evidence at New Build hearing)
- These estimates are to the 10 km limit not to the evacuation centres.
- OPG provided ETEs until 2060 for Pickering review.

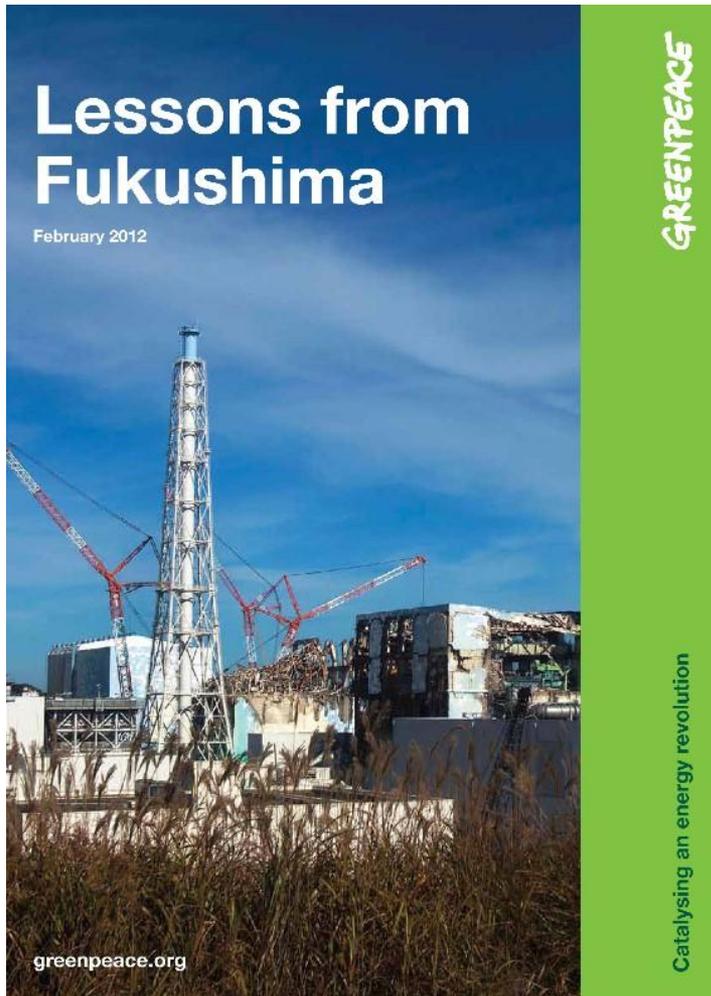
7 million live within 100 km of Darlington



Result of current approach

- Large accidents not taken seriously: nuclear accident not considered within the top ten emergency risks for Durham region (12 reactors)
- Early Release has no detailed planning
- Potential impacts in broader areas across the GTA are not taken seriously

Fukushima relevant....



- ‘Institutional Failure’ caused the extent of the damage at Fukushima not just an act of nature. Credible reviews looked at the impact of not taking catastrophic accidents seriously – lack of emergency preparedness was key factor in the tragedy.
- Empirical probability of meltdown – once a decade somewhere in the world.
- Low probability events need to be planned for – don’t dismiss the risk.

Lessons from Fukushima

- Areas as far away 50 km also had to be evacuated because of high radiation levels
- There were massive “voluntary” evacuations beyond the 20 km zone especially women and children (think Toronto).
- Fukushima demonstrated a need for capacity for independent monitoring following an accident
- Communication and official credibility were major downfalls during the Fukushima events

Public Alerting: Current Plans Aren't Even Implemented


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Spotlight on Ontario public alerting systems

March 20, 2012

Local and provincial authorities have been testing and improving public alerting systems near the Pickering and Darlington nuclear power plants; the Canadian Nuclear Safety Commission (CNSC) is tracking progress towards meeting current provincial standards.

On March 28, the [CNSC is holding a public meeting \(PDF\)](#), available via webcast, to discuss the status of the public alerting system for the City of Pickering and Durham Region. Representatives from Emergency Management Ontario (EMO) will also be in attendance.

At the last meeting held in September 2011, Commission Tribunal members expressed concern that not all [provincial requirements](#) for nuclear emergency public alerting were met. Requirements mandate that practically 100% of the population in the 3 km radius (Contiguous Zone) from the power plants - both indoor and outdoor - must be warned of an alert within 15 minutes. Specific requirements are also in place for the 10 km zone (Primary Zone).

Following testing in recent years, local authorities confirmed that sirens and phone



The Pickering Nuclear Generation Station is located

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Major Recommendations:

Before the life-extension of Darlington is approved:

- The province of Ontario must develop detailed Emergency Plans for accidents involving large radiation releases, including multi-unit accidents. This should be done with public consultations in affected communities – Durham, Toronto etc.
- The province of Ontario must develop detailed evacuation plans for at least 20 to 30 km areas around Darlington - not just 10 km – until 2055, as well as more detailed plans for 50 to 80 km. (This should also be done for Pickering)
- The suitability of the Darlington site must be re-evaluated in light of growing population and the regular occurrence of nuclear accidents internationally.
- Municipalities within 100 km of Darlington should have the capacity to independently monitor radiation levels in the event an accident.
- Vulnerable communities need extensive advance communication and planning
- Land-use planning around Darlington must be immediately reviewed to avoid continued population growth in the vicinity of the plant

Specific Recommendations and Follow Up to focus on regarding Emergency Planning at Darlington NGS

Recommendations

- Community outreach and education sessions about every aspect of the detailed nuclear emergency plans for large release accidents should be made available
- Transparent and explicit messaging to schools, senior's residences and health facilities should be distributed and posted with regular communication exercises to ensure that family members are aware of plans

Recommendations cont`d

- Review of emergency planning in light of Fukushima should be expedited in Durham Region
- Improvement of communications infrastructure for all zones should be an immediate priority
- Realistic assessments of capacity of evacuation centres should be conducted

Recommendations cont`d

- Nuclear emergency planning exercises for large release accidents should be conducted with increased frequency and the results made public in the community
- Areas of nuclear emergency planning in need of improvement should be tracked and reported publicly in the community
- Predistribution of KI should be made widely available to community members
- Benefits of sheltering in place should be scientifically evaluated with results shared with the community

Recommendations cont`d

- Consistency of nuclear emergency plans of each municipality in Durham Region and the surrounding GTA should be expeditiously reviewed against the most recent provincial Nuclear Emergency Plan
- Capacity of Emergency Measures Ontario to conduct its responsibilities in the case of a nuclear emergency should be expeditiously reviewed

Recommendations cont`d

- Frank evaluation of the potential of emergency planning measures to mitigate personal injury and property from large release accidents should be conducted and transparently communicated to the surrounding community
- Municipalities should retain non-nuclear industry peer review experts to review the adequacy of emergency planning in the entire Durham region

Recommendations cont`d

- The CNSC and Minister of Environment should continue to be pressed for elevation of the Darlington refurbishment to a full panel review
- A community liason committee dealing specifically with emergency planning could be requested to begin to work on outstanding issues to the satisfaction of the community with broad and inclusive public participation in the committee

Recommendations cont`d

- Official Plans for Durham Region should immediately be amended to restrict population growth in the vicinity of the Plants; impacted zone to be determined
- The Province should be requested to issue Minister's zoning orders to accomplish this restriction and/or to issue a statement of provincial interest with which the municipalities are required to comply