



## **Supplementary Information**

## **Renseignements supplémentaires**

### **Presentation from Northwatch**

### **Présentation de Northwatch**

In the Matter of the

À l'égard de

**Ontario Power Generation Inc. -  
Darlington Waste Management Facility**

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**Ontario Power Generation Inc. - Installation  
de gestion des déchets de Darlington**

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Application to Renew the Class IB Waste  
Facility Operating Licence for Ontario Power  
Generation in Darlington, Ontario

Demande de renouvellement du permis  
d'installation de déchets de catégorie IB pour  
Ontario Power Generation à Darlington  
(Ontario)

**Commission Public Hearing**

**Audience publique de la Commission**

**January 26, 2023**

**26 janvier 2023**

# Ontario Power Generation's Application for the renewal of its Waste Facility Operating Licence for the Darlington Waste Management Facility

Ref. 2023-H-09

## Northwatch

January 2023 Presentation to the Canadian Nuclear Safety Commission

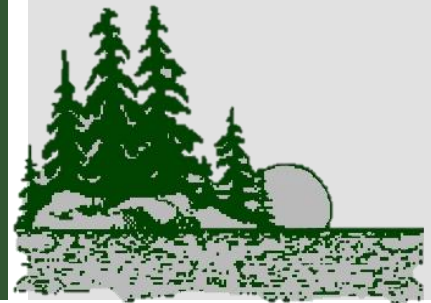


Figure 2: Nuclear Sustainability Services - Darlington



Figure 1: Darlington Site



# Requested Changes to the DWMF Operating License

OPG is requesting the following changes to the WFOL-W4- 355.01/2023 operating licence:

1. A ten-year licence term to April 30, 2033 for the Darlington Waste Management Facility waste facility operating licence
2. A change in the name of the facility from the Darlington Waste Management Facility (DWMF) into Nuclear Sustainability Services – Darlington (NSS-D).
3. The inclusion of the construction and operation of additional Used Fuel Dry Storage Buildings (UFDSBs) #3 and #4 and a name change from UFDSBs to Used Fuel Dry Storage Structures (UFDSSs).
4. A change in the total capacity of UFDSSs #3 and #4 from 1,000 DSCs to 1,200 DSCs.

CNSC staff are recommending that the Commission approve these requests and amend the WFOL-W4- 355.01/2023 operating licence accordingly. Northwatch disagrees with this staff recommendation.

# Licence Period

- During the current license term there were several license amendments made with limited or no public comment or notice
- a shorter license period allows changes to be anticipated and dealt with in the normal course of business rather than as exceptions
- There are a number of significant changes anticipated over the next ten years in the Darlington Waste Management Facility
- There are a number of significant changes anticipated over the next ten years at the Darlington Nuclear Site
- There are a number of significant developments anticipated over the next few years in Nuclear Waste Management Organization's "Adaptive Phased Management Plan"
- point

REQUEST: The Commission should grant a license extension of not longer than five years.

REQUEST: The Commission should direct that design details for future construction of Used Dry Storage Buildings / Structures be ready for full consideration in the next license review...

# Proposed Name Change

- Negative associations for the public are because of the very real challenges in isolating wastes such as spent nuclear fuel from the environment into perpetuity
- Regulatory oversight and the licensing process is not a public relations exercise and a desire by the industry to manipulate public perception should not be a driver or determinant in licensing decisions
- The Darlington Waste Management Facility is a facility which manages high level and some intermediate level waste; it does not recycle copper and steel, it does not manage heavy waters, it does not produce medical isotopes; these activities are outside the function of the DWMF and reciting them in the discussion of the DWMF is an annoying distraction
- It may be OPGs perception that the name “Nuclear Sustainability Services” is “true and inspirational” but that perception is not the public reality; it is not “true” because nuclear waste is not a “sustainable” product and it will, regrettably, be more likely to inspire ridicule than any other reaction

## **REQUEST**

The Commission should reject Ontario Power Generation’s request to change the name of the Darlington Waste Management Facility to “Nuclear Sustainability Services – Darlington (NSS-D

# Planning for Dry Storage of Used Fuel

- Based on an annual processing rate of 22,000 bundles (assume four operating reactors), if Ontario Power Generation was actually processing used fuel from wet to dry storage after ten years out of the reactor (OPG and the industry more generally frequently describe the fuel waste as staying in wet storage for ten years and then being moved to dry storage) in June 2021 there would have been 220,000 fuel bundles in wet storage, and the remainder – 387,425 fuel bundles – would have been in dry storage, in contrast to the 293,669 fuel bundles that actually were in dry storage.
- Ontario Power Generation has had an approval in place for the construction of two additional used fuel storage buildings since 2013. By June 2021 – eight years later - in practical terms they had 93,756 used fuel bundles in wet storage that were overdue for transfer to dry storage. This is very close to the equivalent of the 100,000 fuel bundle capacity of an already-approved dry storage container building

## **REQUEST**

The Commission should require OPG to engage in forward-looking planning and to provide the Commission with a timeline for the transfer of irradiated fuel waste from wet to dry storage.

# Construction of Additional Storage Buildings

- Northwatch disagrees with the authorization to construct two additional used fuel storage buildings / structures being carried for in the license conditions in the absence of detailed information about the designed modifications that will be applied.
- We also disagree with some aspects of the time frame OPG has set out for their provision of documents to the CNSC in advance of certain project milestones.
- For example, submitting the design and design characteristics of the used fuel storage structure to the CSNC only 30 days prior to the start of construction is unacceptable.
- OPG has had the initial approval in place for a decade and the modified approval in place for several years.
- That the design and design characteristics are not available for review and consideration as part of this review process is unacceptable; that the regulator would complete the review of this important information in private and in only thirty days is unthinkable.

## **REQUEST**

The timing requirements for the approval of the two additional used fuel storage buildings / structures should be adjusted to allow adequate review by the public and the regulator



# Location of Additional Used Fuel Storage Structures

Attachment 5 CD# 00044-CORR-00531-01153

Figure 2: Nuclear Sustainability Services - Darlington



Figure 1: Darlington Site



Note: The blue dotted line in this figure is the DNFS exclusion zone.

Source: Attachment 5 to OPG letter, J. Van Wart to M. Leblanc, "Licence Application for the Renewal of the Darlington Waste Management Facility Operating Licence WFOL-W4-355.01/2023" CD# 00044-CORR-00531-01153

# Location of Additional Used Fuel Storage Structures

- There is no supporting information with respect to the location of these additional structures immediately adjacent to Lake Ontario
- The location of the facilities immediately adjacent to Lake Ontario makes them in the most vulnerable position possible with respect to extreme weather events on Lake Ontario
- The location of the facilities immediately adjacent to Lake Ontario with clear site lines to Lake Ontario makes them very vulnerable to terrorist action and / or malevolent acts
- Ontario Power Generation's security strategies are land based, and their response units are mobilized in land vehicles, limiting their ability to detect or respond to threats from the water and water craft, which can come in close proximity to the shoreline and to the proposed location of the additional used fuel storage structures

## **REQUEST**

That the Commission require OPG to do a risk assessment of the additional used fuel storage structures focused on increased threat levels due to the close proximity of the selected site to Lake Ontario

# A change in the total capacity for Dry Storage Structures

- OPG rationale rests on assumptions about the NWMO's DGR
- neither OPG or CNSC support their estimate that these additions will enable adequate capacity until 2043
- Both OPG and CNSC appears to be relying on the availability of a deep geological repository for nuclear fuel waste having been constructed and brought into operation by the NWMO by 2043
- The reliance on the NWMO's still conceptual 'Adaptive Phased Management Project' to be receiving wastes by 2043 is particularly misplaced given that the NMMO has repeatedly adjusted their timelines,
- The expectation that the NWMO would be receiving nuclear fuel waste by 2043 from the Darlington Nuclear Generating station is wholly unfounded; the NWMO's own projections are that waste transfers would not begin from the Darlington Nuclear Generating Station prior to 2050,
- OPG states elsewhere that it intends to construct a BWRX-300 reactor, and has filed a license application and claimed that they expect to have the reactor in operation by 2028 but no consideration is included

## **REQUEST**

The proposed design modifications must be the subject of a public review process, preferably as part of the DWMF license review process

# Additional Issues

Figure 1: Darlington Site



Note: The blue dotted line in this figure is the DNGS exclusion zone.

# Safety Issues

- OPG failed to demonstrate that it meets a number of common safety targets, operational capabilities and due diligence.
- OPG failed to present evidence that there has been adequate qualification of the state of each fuel bundle before storage
- The application did not demonstrate with hard data that the structures, systems, and components important to safety will continue to perform their intended function for the requested period of extended operation
- The defective fuel detection system at Darlington was largely operationally ineffective meaning that defective fuel may not have been identified and it is now in general storage in the dry storage containers
- The dry storage containers are not individually unmonitored, e.g. for heat or radioactive releases
- The Dry Storage Casks defy almost all design norms and provide storage geometries that are unsuitable for effective heat removal

## **REQUEST**

That the review of design and design characteristics of the additional used fuel storage buildings/structures, the preliminary safety analysis report, the environmental management plan and the construction plan should all be subject to public review.

# Safety Assessment Report

- The summaries of safety assessments for off-site dose estimates and worker exposures made assumptions that are unrealistic and arbitrary and deviate significantly from the established norms for safety analyses.
- There are a number of unsubstantiated statements in the Summary Safety Assessment summary report.
- The actual detailed Safety Assessment Report was not made available but the summary itself was instructive of the freedom taken with due diligence
- There was no assessment of effect of ageing on long stored DSCs included, including no discussion of changes in concrete properties with time and radiation, fuel failure propagation, the effects of radiolysis, the effect of Helium escaped from the cask and replaced by studio air or of potential deterioration of the steel liner
- The safety assessment excluded credible accident initiators which are routinely analyzed for reactor safety assessments, including external events such tornadoes, earthquakes, floods, rail line blasts, aircraft impact, fires, etc.
- The SAR does not specify radiation level limits and the estimates

## **REQUEST**

That the review of design and design characteristics of the additional used fuel storage buildings/structures, the preliminary safety analysis report, the environmental management plan and the construction plan should all be subject to public review.

# Issues with Dry Storage Container Design

- The Darlington OPG Dry Storage Cask is an unventilated closed container with practically no means of convective heat removal from the spent fuel bundles encased in storage tubes.
- There are horizontal surfaces for excess water to pool and be absorbed into, and present challenges to evacuation of water by vacuum drying.
- A spent fuel dry storage system is required to dissipate fuel decay and chemical heat by convection of the enveloping gas moving around the fuel elements within the bundles. However, this OPG DSC design does everything to inhibit convective currents around fuel elements by first encasing two bundles in a tube
- There are no mechanisms or processes in place to identify defected bundles in the DSC
- A tightly packed horizontal placement of 384 uncatalogued spent fuel bundles inside a closely spaced pile of tubes within the enveloping concrete container is not conducive to convective heat removal; this is a serious DSC design weakness.

## **REQUEST**

That the review of design and design characteristics of the additional used fuel storage buildings/structures, the preliminary safety analysis report, the environmental management plan and the construction plan should all be subject to public review.

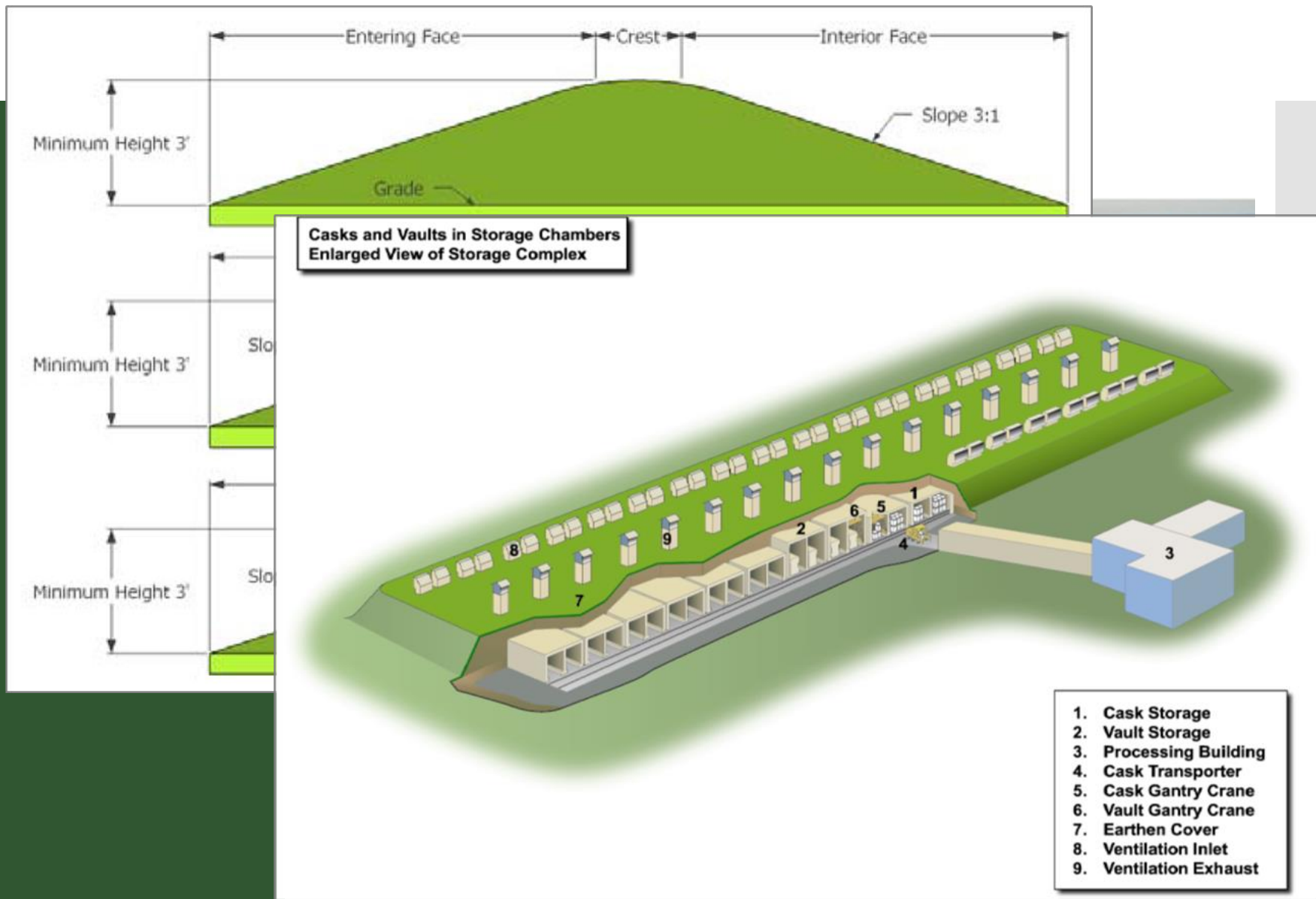
# Future Planning and Waste

- Consideration of Future Fuel Waste Generation
- Long Term Management of Nuclear Fuel Waste
- Extended On-Site Storage

## **REQUEST:**

That the Commission adopt Recommendation #52 of the DNNP Joint Review Panel and require Ontario Power Generation to develop a contingency plan for the long term on-site storage of nuclear fuel waste.





## Reducing Risk: Making Storage More Robust

# Conclusions

In conclusion, Northwatch draws three main findings from our review:

1. Ontario Power Generation's application to renew the operating license for the Darlington Waste Management Facility was incomplete and lacked necessary information.
2. The Safety Assessment was inadequate and should be redone and the full report should be made available to the public.
3. Ontario Power Generation demonstrates poor planning practices and is failing to plan on appropriate timelines and to prepare to meet foreseeable waste management and safety requirements.

Further to those findings, we make the following requests of the Commission:



# REQUESTS

- 1. REQUEST:** Northwatch requests that the CNSC limit the license term to not greater than five years, that OPG's request for a name change be denied, that the carry-over of the construction and operation of additional Used Dry Storage Buildings / Structures be deferred to the next license term or – at minimum – be subject to license hold-points with public involvement in the decision process to remove the hold-point, and that the increase in capacity of the Used Dry Storage Buildings / Structures be contingent on OPG provided additional information and a substantive rationale for the increased capacity.
- 2. REQUEST:** The Commission should grant a license extension of not longer than five years.
- 3. REQUEST:** The Commission should direct that design details for future construction of Used Dry Storage Buildings / Structures be ready for full consideration in the next license review, and that construction and modification – including added capacity – not be undertaken during the 2023-2028 license term
- 4. REQUEST:** The Commission should reject Ontario Power Generation's request to change the name of the Darlington Waste Management Facility to “Nuclear Sustainability Services – Darlington (NSS-D)

## REQUESTS

5. REQUEST: The Commission should require OPG to engage in forward-looking planning and to provide the Commission with a timeline for the transfer of irradiated fuel waste from wet to dry storage.
6. REQUEST: That the timing requirements for the approval of the two additional used fuel storage buildings / structures should be adjusted to allow adequate review by the public and the regulator
7. REQUEST: That the timeline for the review of the design and design characteristics should be a minimum of six months, with the public review period being no shorter than 90 days, commencing no less than thirty days after notice of the review process and the making available of the review documents.
8. REQUEST: That the review of design and design characteristics of the additional used fuel storage buildings/structures, the preliminary safety analysis report, the environmental management plan and the construction plan should all be subject to public review, either as part of the next license review process or by inserting these milestone reviews as license hold-points and holding stand-alone public hearings before the Commission.

## REQUESTS

9. REQUEST: That the Commission require OPG to do a risk assessment of the additional used fuel storage structures focused on increased threat levels due to the close proximity of the selected site to Lake Ontario; this assessment should include identification and assessment of alternative sites within the Darlington property and an explicit examination of those alternatives compared to the selected site relative to security of the facility
10. REQUEST: That as per Northwatch's comments on the proposed design modifications for the additional used fuel storage buildings / structures, the proposed design modifications must be the subject of a public review process, preferably as part of the DWMF license review process.
11. REQUEST: That the Commission provide OPG with explicit direction that their application to construct the BWRX-300, for which the regulatory process has already commenced, must be accompanied by a detailed characterization of the irradiated fuel waste that will be generated by the project and a proposal to amend the Darlington Waste Management Facility license as necessary to house the BWRX-300 spent fuel.

## REQUESTS

12. REQUEST: That the Commission include in their decision on the subject Darlington Waste Management Facility license a license condition that includes a hold-point with a mini-hearing (a public hearing, with participant funding and oral interventions) should the license to construct hearing proceed in advance of the next license review for the DWMF.

13. REQUEST: That the Commission adopt Recommendation #52 of the DNNP Joint Review Panel and require Ontario Power Generation to develop a contingency plan for the long term on-site storage of nuclear fuel waste.

14. REQUEST: That the Commission adopt Recommendation #52 of the DNNP Joint Review Panel and require Ontario Power Generation to adopt the features of storages systems which are more secure and robust, including in current on-site storage practices in in developing a contingency plan for the long-term on-site storage of nuclear fuel waste.