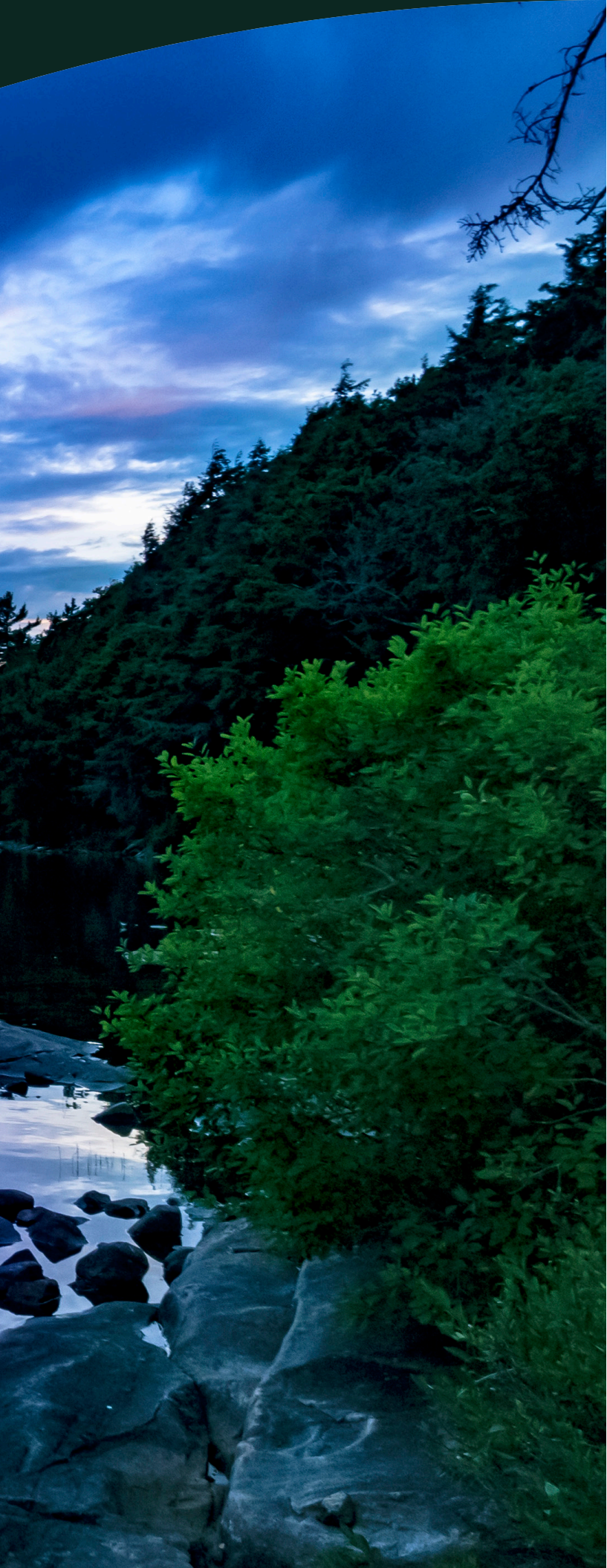


**ONTARIO**POWER  
GENERATION

# Pickering Nuclear Generating Station: Mid-Term Update



**Pickering NGS received top tier certification (Gold) from Wildlife Habitat Council in recognition of initiatives to protect and support local biodiversity.**



# Land *Acknowledgement*

The lands and waters on which the Pickering Nuclear Generating Station is situated are the treaty and traditional territory of the Michi Saagiig and Chippewa Nations, collectively known as the Williams Treaties First Nations.

Pickering NGS is within the territory of the Gunshot Treaty and the Williams Treaties of 1923. The Gunshot Treaty Rights were reaffirmed in 2018 in a settlement with Canada and the Province of Ontario.

Ontario Power Generation respectfully acknowledges that the Williams Treaties First Nations are the stewards and caretakers of these lands and the waters that touch them, and that they continue to maintain this responsibility to ensure their health and integrity for generations to come.

As a company, Ontario Power Generation remains committed to developing positive and mutually beneficial relationships with the Williams Treaties First Nations.





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# Executive Summary

In 2018, Ontario Power Generation (OPG) was granted a 10 year power reactor operating licence (PROL) for Pickering NGS for the period of August 31, 2018 to August 31, 2028. As documented in the Record of Decision, the Commission directed OPG to present a mid-term update on its licensed activities at the Pickering NGS, around the mid-point of the 10 year licence period and no later than 2023.

OPG is proud of the strong performance and the many significant achievements at the Pickering Nuclear Generating Station (NGS) during the current licence term. OPG and its employees continued to generate clean, affordable, and reliable power for Ontario through operations of Pickering NGS.

Through ongoing investments, innovations and the efforts of our employees, Pickering NGS is exhibiting its strongest performance ever, including achieving its highest yearly production output and its best equipment reliability ratings. The station's strong operational and safety performance is also recognized by industry peers.

This track record is a testament to the diligence and passion for excellence that all personnel are committed to on a daily basis in support of the safe and reliable operation of the station. Every day, we demonstrate safety through

our operations, with Canadian Nuclear Safety Commission (CNSC) staff on site to confirm we are meeting rigorous requirements and standards. Our people live and work in Pickering and the surrounding communities. Public and environmental safety is more than a top priority; it is part of who we are.

Year over year, Pickering NGS continues to meet the expectations of the CNSC and demonstrates compliance to requirements through CNSC Compliance Verification activities. The evaluations of all findings for the safety and control areas show that, Pickering NGS made adequate provisions for the protection of the health, safety and security of persons and the environment during this licensing period.

Unit performance at Pickering NGS has improved significantly due to investments and improvements made over the licensing period. As a result, in 2022 all six units at Pickering NGS had a record 109 day continuous run. This was the longest such run in the history of the 6 operating unit station and is strong evidence that the plant is being operated and maintained well. In addition, Pickering NGS Unit 4 achieved a record two-year run, operating for 730 consecutive days before beginning scheduled preventative maintenance in 2021.

OPG prides itself in being a leader. Being a leader starts with building a diverse and inclusive workforce, one that is reflective of the people we serve. In March 2022, we launched our 10-year Equity, Diversity, and Inclusion (ED&I) strategy to guide

our journey towards ED&I excellence. Through the strategy, we are committed to becoming a global ED&I best practice leader by 2030. In 2023, OPG was named one of Canada's Best Diversity Employers. The award recognizes employers across Canada for exceptional workplace ED&I programs.

Safety above all continues to be our top priority. Every year from 2018-2022, Electricity Canada awarded OPG with the President's Award of Excellence for Employee Safety - Generation. The award recognizes OPG's achievement of being in the top quartile for both all injury/illness frequency and lost time injury severity rates.

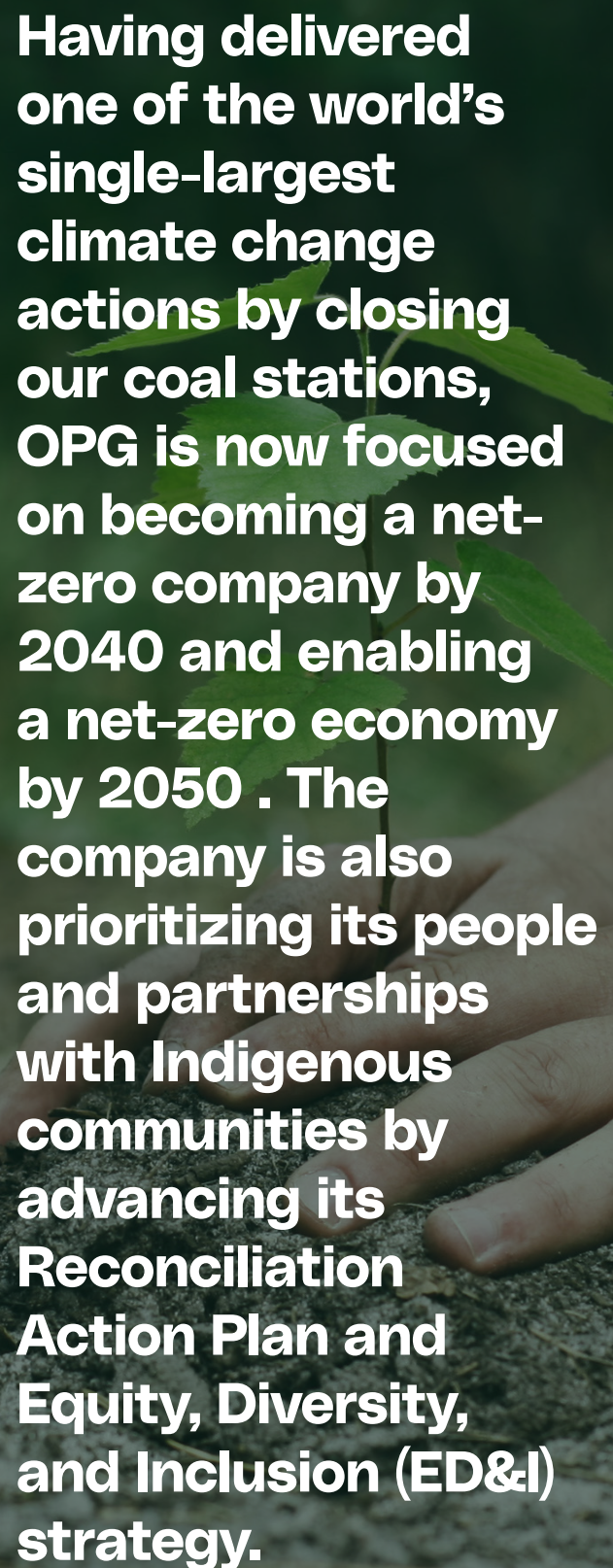
OPG is particularly mindful of its responsibility to ensure protection of the public and the environment. OPG has an extremely strong track record in this area. The environmental monitoring program regularly samples water, air, and soil and results are posted on OPG's website so that local communities and interested members of the public can be assured of the plant's safety.

OPG is committed to engaging with Indigenous Nations and communities regarding nuclear operations and future projects. OPG's Indigenous Relations Policy provides a framework for engaging with Indigenous peoples and providing support for community programs and initiatives while respecting treaty and Aboriginal rights as per Section 35 of the 1982 Constitution Act. For example, during the current licence period, OPG signed framework agreements with Curve

Lake First Nation and Mississaugas of Scugog Island First Nation and work is progressing with Hiawatha First Nation to develop a similar agreement to support regular engagement.

OPG maintains strong relationships with local communities and shares information on facility operations and performance with members of the public. OPG also works to develop positive relationships with local communities, including those in the vicinity of the Pickering facility and Indigenous communities, as well as with stakeholder groups that have a longstanding interest in the safety of nuclear power.

By operating Pickering NGS safely and reliably each and every day, OPG will continue to demonstrate our steadfast commitment to the people of Ontario to provide clean and affordable power that will meet the forecasted increase in electricity demand.



**Having delivered one of the world's single-largest climate change actions by closing our coal stations, OPG is now focused on becoming a net-zero company by 2040 and enabling a net-zero economy by 2050 . The company is also prioritizing its people and partnerships with Indigenous communities by advancing its Reconciliation Action Plan and Equity, Diversity, and Inclusion (ED&I) strategy.**



**Pickering NGS staff who have devoted themselves to the station's operations have done so with tremendous dedication and a steadfast commitment to meeting rigorous safety requirements and standards.**

# About Pickering Nuclear Generating Station

OPG's Pickering NGS generates reliable, carbon-free electricity that powers the lives of over a million Ontario homes and businesses, in a safe and sustainable manner.

This world-class facility features six operating CANDU reactors (CANadian Deuterium Uranium), and accounts for approximately 14% of Ontario's electricity needs, by generating power that is virtually emissions free.



Avoids equivalent  
emission of  
**643,000** gas-  
powered cars



Powers  
**1.5 million**  
homes annually

Protects  
**4,500**  
jobs annually



Ensures a  
stable supply of  
**Cobalt-60**,  
a critical medical  
isotope



# Commitment to Excellence

OPG made many positive impacts through our operations and initiatives in the surrounding communities during this licensing term. OPG is grateful to receive the following recognitions and remains motivated to maintain momentum in striving for continuous improvement.



In 2019 and 2020, Pickering NGS was recognized with Business Excellence Awards by the Whitby Chamber of Commerce and the Ajax Pickering Board of Trade. Both awards were received for the station's continued commitment to innovation in governance and overall business excellence.



In 2020, the Institute of Nuclear Power Operations (INPO) recognized Pickering NGS with an Excellence Award. The award is presented to nuclear power plants that have achieved the top performance in the industry.



In 2020, the Pickering Radiation Protection (RP) organization was recognized with the 2020 John S. Hewitt Team Achievement Award from the Canadian Nuclear Society and Canadian Nuclear Association. The award recognizes the efforts made in the development and implementation of an RP Excellence Index. The RP Excellence Index measures

RP human performance at the department level, driving continuous improvement through targeted initiatives.



In 2021, the City of Pickering recognized Pickering NGS with an Environmental Award in recognition of the more than one billion tonnes of climate change-causing greenhouse gas emissions that have been avoided due to its operations. Pickering NGS staff continue to work closely with the City of Pickering and surrounding homes and businesses on community environmental initiatives.



Gold certification awarded to Pickering NGS for the period of 2020-2022 by the Wildlife Habitat Council, an international group that promotes and certifies habitat conservation and management.



In March 2023, OPG was proud to be named one of Canada's Best Diversity Employers, an award that recognizes employers across Canada for exceptional workplace equity, diversity and inclusion programs.



OPG was named one of Canada's Best 50 Corporate Citizens for the 10th year in a row by Corporate Knights in 2022.





# Leading the *Future*

In March 2023, we were proud to be named one of Canada’s Best Diversity Employers, a major recognition in the company’s journey to be a global leader in ED&I. The award recognizes employers across Canada for exceptional workplace ED&I programs. We know building a more diverse and inclusive company is the right thing to do as a society. We are on the right track, as half of OPG’s executive leadership is comprised of designated groups, including women and racialized people and currently, women make up the majority of OPG’s Board of Directors.

To meet our goals, we will continue to proactively identify and eliminate systemic barriers within OPG through training, policy review and changes to business practices, including hiring and advancement processes. In February 2022, we became BlackNorth’s founding partner in the launch of a recruitment platform to promote employment opportunities

in STEM for racialized candidates. In recent years, OPG co-founded the Nuclear Against Racism initiative to address racism in our industry, partnered with the United Way of Greater Toronto to support their Black, Indigenous, People of Colour Equity Fund, and became a member of 30% Club Canada, which aims to increase female representation across Canadian businesses.

History was made at OPG’s Pickering Nuclear Generating Station on the March 17th, 2022 night shift with the first-ever, all-women led crew. The achievement was a proud moment for all involved and reflects the strong progress made by OPG to address systemic barriers to becoming more equitable and inclusive and the progress the company is building on with its 10-year ED&I Strategy.

We are committed to accelerating equity, celebrating diversity and fostering a culture of inclusion. This is just one example of how we are successfully bridging the gap in gender equality.





Pickering Nuclear Generating Station  
Mid-Term Update

Pickering Nuclear Generating Station  
Mid-Term Update

Pictured left to right: Sara Rasouli, 058 Control Room Shift Supervisor, Kasia Carisse, 014 Control Room Shift Supervisor, Krista Huszarik, 014 Shift Manager and Julie Thrasher, 058 Shift Manager.





# Advancing Reconciliation

In October 2021, OPG launched its first-ever Reconciliation Action Plan (RAP) to meaningfully advance Reconciliation with Ontario’s Indigenous Nations and communities, businesses, and organizations.

The plan’s primary goals include growing OPG’s economic impact for Indigenous communities and businesses to \$1 billion over the next 10 years, increasing Indigenous representation at all levels, strengthening environmental stewardship, and improving awareness and understanding of Indigenous culture, history, and perspectives within the company.

Some highlights from the 2022 RAP include:

- Delivered approximately \$77 million in economic benefits to Indigenous

communities and businesses, with \$56 million in Indigenous procurement and \$21 million in distributions from our equity partnerships to our Indigenous partners.

- Issued 69 new purchase orders against a target of 30 Indigenous vendors and added a total of 27 new Indigenous vendors to our approved supplier list.
- Hired and secured placements for 24 skilled Indigenous employees, through our Indigenous Opportunities Network (ION).
- Established an internal RAP Working Group and Steering Committee to ensure tracking and reporting on commitments and actions.

The ION is a program aimed to increase the representation of Indigenous workers at OPG and within the broader energy sector. To date, the ION program has placed over 100 Indigenous candidates in positions that match their career interests, qualification and skill sets, in the energy industry.

Pillar	Goals
Leadership	<b>Commit</b> to reconciliation as a journey and track progress on accountability
Relationships	<b>Build</b> positive and mutually <b>beneficial</b> relationships
People	<b>Create</b> an engaged and inclusive workforce that reflects the broad diversity of Indigenous communities
Economic Empowerment	<b>Advance</b> economic reconciliation through meaningful engagement, collaboration and partnership
Environmental Stewardship	<b>Be</b> a trusted partner in environmental stewardship

Reconciliation Action Plan Pillars

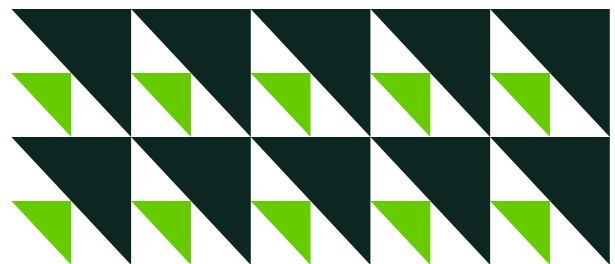


Approximately 80-85% of candidates are in apprenticeships/skilled trades and 15-20% are employed with a professional skillset (such as project management).

For 2023 and beyond, an overarching Indigenous Engagement Plan is also being developed by OPG in collaboration with the Indigenous Nations and communities proximate to OPG's nuclear operations which will support the prioritization and resource allocation required to continue meaningful engagement on Pickering NGS's operations. In 2021, OPG received Gold Certification through the Canadian Council of Aboriginal Business' Progressive Aboriginal Relations program.

These are all signs of progress on our Reconciliation journey, which began more than two decades ago with the development of a formal framework to assess and resolve historic grievances related to the adverse impacts to First Nation lands from hydroelectric development.

OPG's employees remain committed to advancing our Reconciliation journey. We will continue to listen, learn, and build momentum to meet our ambitious goals and support the Truth and Reconciliation Commission's Call to Action #92, which urges corporate Canada to help create a better future.



# Pickering NGS

## Performance

The safety of the public and our staff is our number one priority. Pickering NGS is designed and operated to ensure the safety of the public, our employees and the environment. Ontario Power Generation maintains effective safety systems, robust emergency plans and strives to keep the public informed through our many nuclear emergency preparedness campaigns and initiatives.

### Nuclear Safety

The guiding principles established in OPG's Nuclear Safety Policy state that nuclear safety shall be the overriding priority in all activities performed in support of OPG nuclear facilities; nuclear safety shall have clear priority over schedule, cost and production; staff must demonstrate respect for nuclear safety and conduct themselves in a manner that is consistent with the traits of a healthy nuclear safety culture. These principles are continually reinforced at Pickering NGS and are internalized by all personnel who support the operations.

In the past 5 years, OPG has demonstrated compliance through the following activities:

- Comprehensive safety analysis demonstrates likelihood of a serious accident remains very low.
- Probabilistic Safety Assessment

(PSA) concludes low and continued reduction in public risk.

- Emergency Mitigating Equipment that was installed significantly reduces risk.
- Ongoing monitoring of the health of the Nuclear Safety and Security Culture.

### Safety Enhancements

OPG is committed to continuous improvement in safety at all of its nuclear facilities and has robust comprehensive programs in place that are aligned with industry best practices for ensuring the condition of Systems, Structures and Components (SSCs) important to safety are well understood and well maintained.

OPG continued to invest to further enhance safety at its nuclear facilities including:

- Completion of hydrogen passive autocatalytic recombiners installations in all Pickering NGS units;
- Provisions for Phase-1 emergency mitigation equipment (EME) to provide emergency make-up water and power for ensuring continuous fuel cooling and monitoring;
- Completion of Severe Accident Management Guidelines (SAMGs) to provide plant staff with guidance on prevention and mitigation of accident progression to a severe accident; and
- Completion of Phase-2 EME provisions

that provide emergency back-up power to important containment equipment such as boiler room air conditioning units and hydrogen ignitors on all units to protect containment integrity allowing the use of the existing emergency air filtered discharge system for controlled filtered post-accident venting of containment.

## **Deterministic Safety Analysis**

The deterministic safety analysis (DSA) has been extensively used from the inception of the Pickering NGS design and is a key tool for supporting the adequacy of the plant safety provisions. DSA uses validated scientific models and conservative assumptions to analyze the response of the reactor and other plant systems to hypothetical abnormal or accident conditions and assesses potential consequences.

The Pickering NGS DSA is governed by OPG's Reactor Safety Program and is documented in the Pickering Safety Reports, which demonstrate compliance with licensing limits and derived acceptance criteria. The Safety Reports are periodically updated and submitted to the CNSC in accordance with regulatory requirements. Pickering A Safety Report – Accident Analysis was last updated in 2018 and Pickering B Safety Report – Accident Analysis was last updated in 2019.

The Safety Report is used to identify limits on process parameters and safety system requirements, and serve as a basis to establish the safe operating

envelope (SOE) for the station. For Pickering NGS, the DSA demonstrates that adequate safety margins are in place for design basis events.

Related to heat transport system safety margins, additional focus has been given to this aspect by updating analyses or addressed in the PSR prepared for Pickering. The effects of aging of the Pickering reactors are managed effectively and OPG ensures that safety analysis margins are maintained through to the end of commercial operation (ECO).

OPG is benchmarking good practices for SOE program with Bruce Power and NB Power to further improve the program.

## **Probabilistic Safety Analysis**

The Probabilistic Safety Assessment (PSA) is an important tool used to demonstrate that the design and operation of a nuclear power plant poses an acceptably low level of risk to the public. The main benefits of PSA include the identification of risk insights that can be used to improve the safety of plant design and operation.

The Pickering NGS B PSA (PBRA) was updated and submitted in 2022. The updated 2022 PBRA addresses Level 1 and Level 2 PSA aspects for various internal and external events, for both at-power and outage operating conditions, including internal events, internal fire, internal flood, seismic, high winds, as well as an external and internal hazard screening assessment and PSA for non-reactor sources.

The PBRA reports submitted to CNSC staff in 2022 demonstrate that Pickering NGS B satisfies safety goals for all internal and external hazards, and hence represents very low public risk. The Pickering NGS A PSA will be submitted to the CNSC in 2023.

External events such as fires, floods, high winds, and seismic events have a specific PSA for both Pickering NGS A and B which are utilized for ad-hoc assessments that require specific risk-informed insights for those hazards. Pickering has successfully updated all models to utilize the latest EPRI Instantaneous Risk Monitor software (Phoenix) with features like remote risk quantification proved to be very beneficial during COVID for off-site support staff. Pickering has a multi-hazard risk monitor which is a CANDU first-of-a-kind that allows insights for all available internal/external monitors in one screen. This allows for aggregate risk capability to assess combined risk for Internal Events and all Hazards in one risk monitor. CANDU Owners Group (COG) Pilot for generating risk management guidelines relied on Pickering's multi hazard risk monitor.

Under the Risk and Reliability Program, actual station specific component reliability data are collected and added to generic industry component failure data to obtain component failure rates. The 2022 Annual Reliability Report for Pickering NGS A and B reported that all systems important to safety met their unavailability targets in 2022.

The overall conclusion of the Pickering NGS Units 1 and 4 and the Pickering NGS

Units 5 to 8 PSA is that the public risk from Pickering NGS operation remain low.

## Radiation Protection

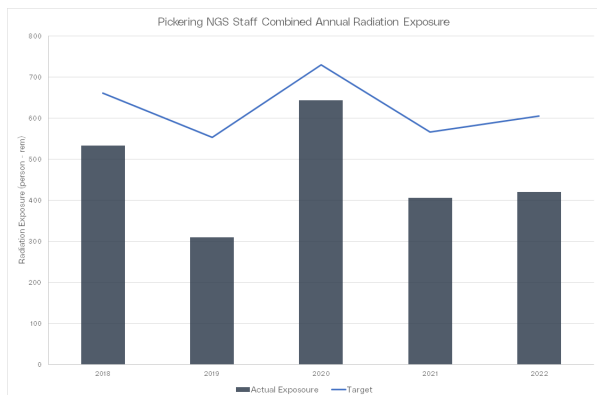
As Low As Reasonably Achievable (ALARA) is a foundational principle in radiation protection, ensuring that radiation dose to all persons is kept as low as reasonably achievable. ALARA is implemented at Pickering NGS in accordance with the OPG radiation protection program. This program ensures compliance with regulatory requirements to keep exposures ALARA, implement control of occupational and public exposure, and plan for unusual situations.

The performance targets for Site Collective Dose which is the total radiation dose for individuals working at the Pickering NGS, are established annually. Figure 3 below shows Pickering NGS Collective Radiation Exposure is better than the yearly targets. This was achieved through the implementation of increased line accountability for dose and improvements driven through lessons learned and OPEX. Improved tooling and training also played an important role in major outage campaigns, as is evidenced by continued dose performance improvement against target.

Pickering NGS ALARA strategy initiatives that contributed to improved dose performance also include improved shielding and specialized dose reducing resin in heat transport ion exchange columns to reduce dose rates from system equipment.

Enhancement to worker's dose control

tools include the increased use of teledosimetry, a system of radiation protection equipment which transmits information from video camera feeds, voice communications, and instrument data. Teledosimetry allows RP staff to monitor radioactive work remotely. RP staff can observe workers using the cameras while monitoring their accumulated radiation dose and dose rate information via a computer interface. Continuous monitoring of hazard levels and remote monitoring of worker dose reduce the risk of workers working in changing hazard conditions and ensure dose is kept ALARA.



## Employee Health and Safety

Workplace health and safety and public safety are fundamental core values at OPG. OPG is committed to operating all of its facilities in a safe, secure and reliable manner that reduces risks to an acceptable level.

Health and safety are overriding priorities in all activities performed. Pickering NGS employees and contractors are expected to conduct themselves in a manner that ensures workplace health and safety and public safety in line with OPG’s health and safety culture, the Employee Health and

Safety Policy and the Safe Operations Policy.

OPG is committed to achieving excellent performance in the area of workplace health and safety through continuous improvement and a strong health and safety culture, with the ultimate goal of zero injuries.

During the current licence period, OPG has stood in the top quartile of its comparator Canadian electrical utilities in various safety performance metrics. In 2018, Electricity Canada awarded OPG with the President’s Award of Excellence for Employee Safety - Generation. OPG has since received this award every year from 2018 to 2022 in recognition of OPG’s top safety performance.

In 2022, our people continued to demonstrate their unwavering commitment to safety, as we met our target performance for Serious Injury Incidence Rate and recorded our second best-ever Total Recordable Injury Frequency performance, two key safety metrics.

As part of our continuous improvement plan, OPG has launched the Fail Safe initiative in 2020/2021. OPG has demonstrated an excellent safety performance record over the years, however, potential risk areas need mitigation. Fail Safe is a culture shift that recognizes that human error can occur, and ensuring when that happens, the individuals are protected. It is a shift in mindset to proactively identify whether the defences in place are sufficient. The initiative has been incorporated into safe work planning, work execution, and event learning. This provides the platform to further improve OPG’s safety program.

*OPG made it a priority to provide education, awareness, and resources to help employees and their families navigate these challenging times with mental health support.*

## Mental Health Support

With the challenges of COVID-19, OPG has put increased focus on cultivating and strengthening the importance of mental health by:

- Continuing to provide Mental Health First Aid Training;
- Reducing stigma surrounding mental health through various mechanisms;
- Continued encouragement of our employees to access our Telus Health Program (previously Employee Family Assistance Program);
- Enhancement of our mental health focus in our return-to-work program;
- Offering a remote health care provider service to all employees. This allows for employees who don't have a family physician to access medical services faster, and;
- Collaboration with Human Performance department to support the Mental Health Advocates program.

In recognition of our support of employees' mental health and well-being during the pandemic, OPG received a Pandemic Heroes award under the Essential Service Employer category. This national award was created in

partnership with Ontario Shores Centre for Mental Health Sciences, the Canadian Mental Health Association and the Mental Health Commission of Canada. Mental health has and will continue to be a focus for OPG in future years as the company reviews its existing framework and ensures alignment with the CSA Standard, Psychological Health & Safety in the Workplace.

## Emergency Preparedness

OPG believes there is no such thing as being too prepared. Our nuclear safety and emergency preparedness program is designed to ensure the company can manage an emergency in a timely and effective manner.

A comprehensive emergency preparedness plan is in place to protect employees and the public, the environment, property and assets, and ensure operational continuity in the very unlikely event of a nuclear emergency. In the past 5 years:

- OPG's Security and Emergency Services staff continued to provide 24/7 emergency response coverage at the Pickering nuclear station.
- OPG, along with regional, provincial and municipal emergency preparedness groups, distributed 150,000 emergency preparedness kits

to residents and businesses within 10 kilometres of the Pickering stations.

- As required, in October 2020, OPG executed a full-scale nuclear emergency response exercise at Pickering NGS to test the response plans of OPG and various government agencies.

The Nuclear Emergency Preparedness program is documented in OPG's Consolidated Nuclear Emergency Plan. This plan describes concepts, structures, roles and processes to implement and maintain an effective OPG response in the unlikely event of a nuclear emergency. The Consolidated Nuclear Emergency Plan provides a framework for interaction with external authorities and defines OPG commitments under the Provincial Nuclear Emergency Response Plan (PNERP). A Provincial update of the PNERP Master Plan is expected in December 2023, after which OPG processes and programs will be revised if required to ensure compliance with any updated requirements.

OPG's Nuclear Emergency Preparedness program ensures OPG has adequate provisions for the preparedness and on-site response capability that would mitigate the releases of radioactive material.

To respond effectively to an emergency, Pickering NGS practices the response capability of staff through simulated emergencies, and maintains plans and procedures to ensure that this capability is sustained.

Maintaining qualified Emergency Response Organization (ERO) staff is an

integral component to OPG's Emergency Preparedness Program. This ensures the ERO receives current training and has the experience and knowledge to respond to an event. Qualified ERO members are required to complete practical evaluations, as documented in OPG governance, to maintain their qualifications. These practical evaluations may be a drill, exercise, real event or procedural walkthrough with a qualified person.

To demonstrate OPG's emergency response capability, Pickering NGS maintains an extensive drill and exercise program. This program validates emergency plans and procedures and provides the emergency response organization with the opportunity to improve and sustain their emergency response capability.

In the unlikely event of an emergency at Pickering NGS, OPG would perform the appropriate notifications to the Province, CNSC, and local municipalities in accordance with established procedures. Pickering NGS takes actions to control and mitigate the emergency on-site and minimize off-site effects. The Province under the PNERP takes actions to notify and protect the public, including recommending protective actions such as sheltering, potassium iodide ingestion, or evacuation, with support from local municipal emergency response organizations.

In October 2020, OPG executed a full-scale nuclear emergency response exercise at Pickering NGS. The exercise involved the participation of the OPG

Emergency Response Organization (ERO), as well as organization and government agencies at the Municipal, Regional, Provincial, Federal, and International levels. The overall purpose of the exercise was to demonstrate the collective response capability to a nuclear event in the Province of Ontario per requirements of CNSC REGDOC-2.10.1 Nuclear Emergency Preparedness and Response. The exercise and scenario were designed to test emergency plan arrangements less commonly demonstrated, including the ERO assuming their roles for multiple days into an incident. This exercise helped demonstrate the collective readiness of OPG and local response organizations to respond to a nuclear emergency at Pickering NGS.

The Pickering NGS inter-operability exercise, Exercise Unified Command 2023, will take place from September 27 to 28, 2023. An additional day is planned on September 29, 2023, for OPG only to test its recovery objectives. The general objective of this exercise is to test the preparedness of the utility - (OPG), government and non-government agencies and communities, and the inter-operability of these agencies to respond to a nuclear emergency.

In May 2022, OPG and Emergency Management Ontario (EMO) endorsed a new five (5) year agreement to support EMO in the planning, maintenance, and execution of the PNERP. This new agreement further supports the province who provide staff with expertise in emergency planning, nuclear and radiological science, hazard identification

and risk assessment, drills, exercises, maintenance of 24/7 nuclear emergency response capability, and nuclear education and emergency preparedness materials.

OPG provides Monitoring and Decontamination Unit capability and readiness at emergency worker and reception centres. Enterprise Emergency Management maintains equipment inventory at the designated offsite centres with the support of the local facility staff.

OPG is continuously working with community partners and external stakeholders to improve off-site support. OPG, in conjunction with another nuclear facility, has prepared Radiation Basics training to be provided to City of Toronto and Durham Region to support Emergency Worker training efforts.

Offsite centre exercises continue to be conducted as required. During these exercises, the OPG Monitoring and Decontamination Unit was activated and processed members of the public and their vehicles. Full participation of community partners was present at all levels. Lessons learned from these exercises have been incorporated in the processes and procedures for OPG, Durham Region and other applicable participating organizations.

OPG also works closely with The Toronto Emergency Workers' Centre Working Group. The purpose of the Emergency Workers' Centre Working Group is to coordinate preparedness and response planning for nuclear emergencies with

specific focus on Land and Marine Emergency Workers' Centres as required by the PNERP.

The offsite drill and exercise efforts are in addition to the routine work of OPG's Emergency Response and Fire Protection staff who work with key members of the Ajax-Pickering hospital to review and familiarize each other with procedures and training relevant to radiological emergency situations.

To ensure emergency plans continue to support a timely and safe evacuation in the event of a nuclear emergency, OPG monitors and engages with the Province, Region of Durham, and the City of Pickering regarding land use policies and activities in associated emergency planning zones to ensure there is no adverse impact on implementation of nuclear emergency plans.

The equipment important to emergency response (EITER) program identifies equipment that is allocated to Pickering NGS to support an emergency response and ensures contingency actions are taken when equipment is taken out of service or becomes unavailable. This includes procedures and processes which identify EITER systems, structures, and components, as well as essential tools and equipment, necessary to implement the Consolidated Nuclear Emergency Plan.

In 2020, a fleet-wide cross-functional EME Excellence Team was established, driving improvements to the EITER program by improving procedures, processes, teamwork, accountabilities

and delegation of roles and responsibilities related to EME.

OPGs EITER program aligns with industry best practices and in 2020, the program was recognized as a strength by international utility peers because of its innovative practices for tracking, managing, and maintaining this equipment. Enterprise Emergency Management works closely with station staff to ensure EITER unavailability is reduced and equipment is restored quickly.

The EITER program ensures that OPG has the capability to implement the emergency plan through the readiness and availability of the EITER equipment, facilities, or through enacting compensatory measures or use of designated alternate facilities where the primary means may be unavailable.

## Potassium Iodide Pills

As required by CNSC regulatory document REGDOC-2.10.1, Nuclear Emergency Preparedness and Response, the pre-distribution of an iodine thyroid blocking agent or potassium iodide (KI) is required in within a 10 km radius around Pickering NGS.

KI tablets are pre-distributed by the Region of Durham/City of Toronto to 10 km detailed planning zone (DPZ) institutions to allow for timely ingestion of KI tablets and should only be taken when instructed by public health authorities. These institutions include schools, childcare centres, health care facilities and municipal services. In the unlikely

event of a nuclear emergency, additional supplies of KI are available at reception centres, emergency workers centres and for the Ingestion Planning Zone (50 km IPZ) by the Province of Ontario.

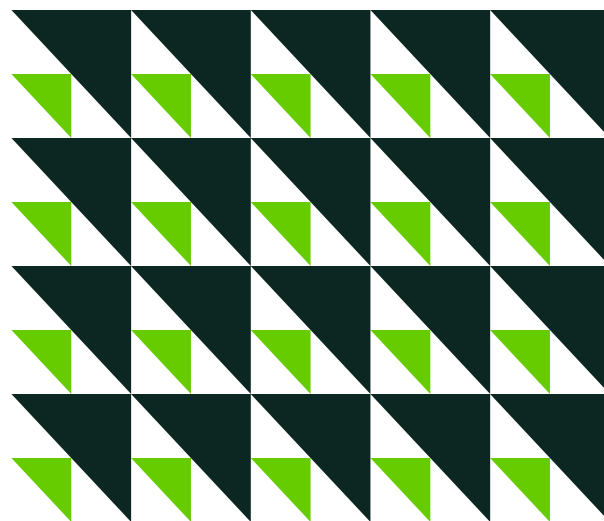
OPG continues to maintain a KI pill pre-distribution program for the communities, businesses, and residences in the 10 km vicinity of the Pickering NGS. The KI pill inventory for the pre-distribution program is maintained separately from the inventory that is maintained by the Province of Ontario.

The Prepare to Be Safe website ([preparetobesafe.ca](http://preparetobesafe.ca)) serves as a platform for KI pill information and provides a means for businesses and residents within 50 km of Pickering NGS to request KI pills. Website information is translated into the most common languages spoken within 10 km (based on census data). New households and businesses in the 10 km DPZ are identified monthly by Canada Post and sent KI pills with supporting information included.

KI public awareness campaigns are held regularly (three times per year). The campaigns are focused on the 10 km DPZ but they are also extended into the 50 km IPZ, through various media (e.g., news releases, print advertisements, social media, and digital display boards). Durham Region has produced videos to raise general awareness about KI, one of which focused on the availability of KI within the 50 km IPZ.

OPG is committed to building long-term mutually beneficial working relationships and information sharing with other

utilities, as well as organizations responsible for public health and emergency management coordination proximate to our operations. OPG continues to participate and support the CNSC-led Potassium Iodide Working Group (KIWG). A Phase I report was prepared and published on the CNSC KIWG website. The purpose of the Phase I Report was to fulfill the commitment to the Commission to provide clarity on the existing plans and associated responsible authorities for distributing KI pills in the 50 km IPZ for Pickering NGS. Phase II work, commenced in early 2022, is being led by the Province of Ontario, given its jurisdiction over offsite nuclear emergency management, including protective action response planning and decision making. This Phase is focused on the feasibility of pre-distribution of KI pills to all schools within the 50 km IPZ and establishing clear and detailed plans for the distribution of KI pills throughout the 50 km IPZ, if necessary. Any changes to the KIWG work will be reflected in PNERP updates, and OPG will maintain compliance.



# Protecting the Environment

At our nuclear operations, OPG maintains stringent monitoring and protection systems to limit emissions from our stations to ALARA, in compliance with regulatory limits. We do this to protect our communities, environment, and our employees. As well, there is rigorous oversight provided by the CNSC.

To ensure no adverse impacts to human health and the environment, OPG maintains environmental monitoring programs in the vicinity of our nuclear facilities. These programs are designed to assess impacts, demonstrate compliance with regulatory limits, validate the effectiveness of containment and effluent controls, and verify predictions made by environmental risk assessments.

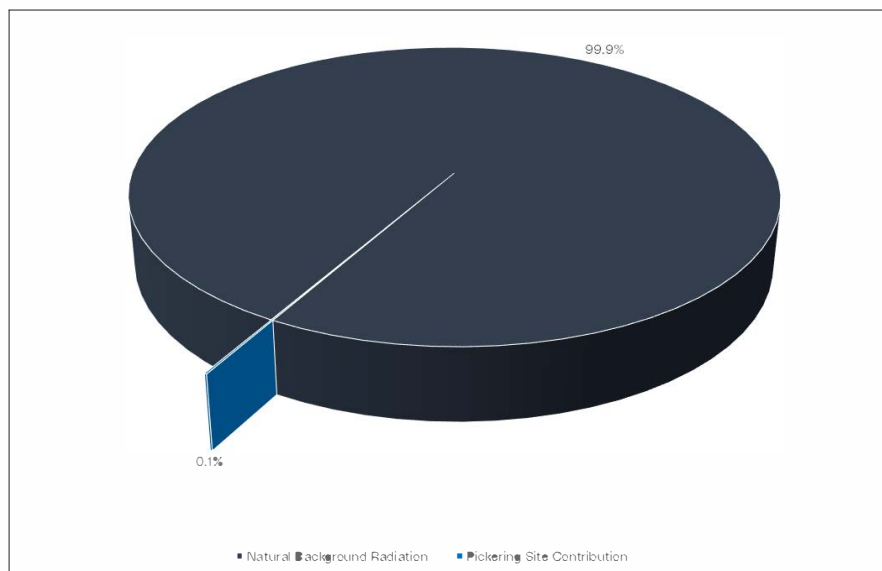
The results from our monitoring programs confirm the impact of Pickering NGS operations on the local population and

environment continues to be very low and well below the annual established limits. OPG tracks and reports environmental emissions data for Pickering NGS for each quarter and publishes the data publicly on OPG's website (opg.com).

The critical group doses resulting from the operation of the Pickering NGS are a very small fraction of both the annual legal limit of 1,000 microsieverts ( $\mu\text{Sv}$ ), an international unit of radiation dose measurement, and the area's estimated annual average natural background radiation dose of 1,400  $\mu\text{Sv}$ .

Over the past 5 years, the dose to the public was generally equal to or less than 0.2% of the annual legal limit of 1000  $\mu\text{Sv}$ . The public dose for 2022 was 1.9  $\mu\text{Sv}$ .

In May 2022, the CNSC released sampling results from its 2021 independent environmental monitoring program, which provided evidence that there are no health impacts from the operations at the Pickering NGS.



**RADIOACTIVE DOSE RELATIVE TO NATURAL BACKGROUND RADIATION 2022**

## Environmental Risk Assessment

OPG has completed an updated Environmental Risk Assessment (ERA) for Pickering NGS. The report was submitted to the CNSC in April 2023 and is available on OPG's website.

The purpose of the Pickering NGS ERA is to assesses potential human health and ecological risks from exposure to radiological contaminants, conventional contaminants, and physical stressors (eg. noise) present in the environment as a result of site operations. This is achieved through completion of a human health risk assessment (HHRA) and an ecological risk assessment (EcoRA).

The 2022 Pickering NGS ERA meets the requirements of the Canadian Standards Association (CSA) N288.6-12 standard, Environmental risk assessments at Class I nuclear facilities and uranium mines and mills.

Overall, the data considered for this ERA includes results of the 2014/2015 sampling programs and routine environmental and effluent monitoring data from 2016 to 2020 including data from the Environmental Monitoring Program for radiological contaminants; waterborne emissions data from Environmental Compliance Approval (ECA) monitoring programs; and predicted airborne emissions through annual Emission Summary and Dispersion Modelling (ESDM) reports. The ERA results are intended to be conservative so as to not under-estimate any risk to the public and the environment.

The results of the ERA inform the environmental monitoring programs (EMP)

and effluent monitoring programs, as per CSA N288.4-10 "Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills" (CSA, 2010) and CSA N288.5-11 "Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills" (CSA, 2011), respectively. These programs can also inform the ERA by providing information on effluent concentrations and loadings, and by providing environmental data to assist in model calibration and validation.

The ERA is reviewed and updated every five years based on ongoing environmental monitoring data, operational experience and advances in scientific knowledge.

The 2022 Pickering NGS ERA confirms that Pickering NGS is continuing to operate in a manner that is protective of the health of the public and the environment.

## Predictive Effects Assessment

The purpose of the Predictive Effects Assessment (PEA) is to identify and assess the potential interactions with the environment as a result of future site activities and to determine whether or not adequate provision for the protection of the environment and health of persons has been considered.

In 2017, OPG undertook a PEA as required under the Nuclear Safety and Control Act to support the Pickering NGS power reactor operating licence renewal application process and to evaluate the potential for adverse effects to human health and the environment from the activities associated with transitioning the station from ECO to a

safe storage state. The 2017 PEA focused on the Stabilization Phase (transition to safe storage which includes defueling and dewatering reactor units) and the first ten years of Storage with Surveillance Phase (to allow for natural decay of radioactivity) after which the transfer of all used fuel to dry storage would be completed. The 2017 PEA concluded there would be no predicted potential adverse effects to public nor to the environment.

In 2022, OPG issued a PEA Addendum Report to demonstrate continued protection of human health and the environment based on updated baseline environmental conditions and current operational assumptions.

The 2022 PEA Addendum Report was updated in April 2023 to address comments received from the CNSC and to reflect continued operation of Pickering NGS until 2026. Both the 2017 PEA and the 2022 PEA Addendum reports concluded that there are no potential adverse effects predicted to human health or the environment from continued operation of Pickering NGS (Unit 5 to Unit 8) to 2026 and the proposed Stabilization Phase and Storage with Surveillance Phase activities.

## **Environmental Management System (ISO 14001)**

OPG's Environmental Policy states that OPG shall maintain an Environmental Management System (EMS) which is registered to the ISO 14001 system. OPG's EMS requires assessment of environmental risks and opportunities associated with station activities, and assurance that

any potential adverse impacts to the natural environment are minimized. The EMS program includes OPG's approach to ensuring compliance with applicable environmental regulatory requirements and other compliance obligations.

The Environmental Monitoring Program (EMP), which is a component of the EMS, identifies the contaminants and physical stressors to be monitored and conducts monitoring in the environment surrounding the site. The EMP design uses a risk-based approach and relies on the results of site Environmental Risk Assessment (ERA) to determine what locations and environment media should be chosen for environmental monitoring. Locations considered to be outside the influence of Pickering site operations are also monitored to allow for a baseline comparison with background values. No major changes to the routine sampling program were identified based on the 2022 EMP.

A robust auditing program is maintained as part of OPG's EMS, which includes annual internal environmental compliance audits on ISO 14001 requirements. Adverse conditions or opportunities for improvement are addressed in accordance with OPG's corrective action program.

## **Effluent Monitoring**

During the period from 2018 to 2022, there were no Derived Release Limit (DRL) exceedances for waterborne or airborne emissions.

Pickering NGS tracks daily tritium emissions and focuses on improving

equipment reliability and performance for further emission reductions. This is a station focus area and efforts have been effectively reducing tritium emissions. In October 2020, a micro scrubber column was installed on the U4 stack to manage airborne tritium emissions. The micro scrubber has performed very well in reducing tritium releases to air.

Pickering NGS controls and monitors certain waterborne discharge streams under Environmental Compliance Approvals (ECA). During the current licence period, all effluent streams that are monitored under the ECA were discharged to the environment via approved pathways. There have been eight (8) exceedances during the period from 2018 to 2022, which were reported to Ministry of Environment, Conservation and Parks. Three of these were related to effluent temperature exceedances and the remaining five were as a result of chemical discharge parameters exceedances above the ECA limit. It is worthwhile noting that none of these exceedances led to any significant impact to the public or the environment. Appropriate actions have been taken to minimize recurrence.

## **Groundwater Protection and Monitoring Program**

The Pickering NGS Groundwater Protection and Monitoring program was established to confirm the predominant on-site groundwater quality and flow characteristics of the Pickering NGS site and to detect any emergent issues. The overall objective of the program is to ensure there are no adverse off-

site impacts from contaminants in groundwater. In 2020, OPG implemented the requirements of CSA N288.7, Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills, at the Pickering site. The focus of this standard is groundwater protection of which groundwater monitoring is a major component.

As part of Pickering NGS's annual groundwater monitoring program, samples are collected from the site-perimeter monitoring wells and analyzed statistically to identify any trends. From 2018 to 2022, the groundwater data collected from many of the key areas at Pickering NGS indicate that tritium concentrations have mostly remained constant or decreased, showing stable or improved environmental performance, demonstrating that there are no off-site impacts.

Additionally, as part of the program, groundwater samples are collected from over one hundred sampling locations annually on the Pickering site. Collected samples are mainly analyzed for tritium, but some locations are also analyzed for petroleum hydrocarbons, benzene, toluene, ethylbenzene, xylenes, and dissolved iron. Sampling points include monitoring wells, foundation drains, sumps, catch basins, and ground tubes.

In 2018 OPG developed an interactive Geographic Information System (GIS) Map to display the data associated with the monitoring wells at the Pickering Site. The GIS Map along with the Annual Groundwater Monitoring Report are updated and posted annually to OPG's website.

## Spill Management Program

Pickering NGS has extensive programs to ensure the risk of spills to the environment is effectively assessed and managed.

Any spill that is likely to cause an adverse effect, or simply makes its way to a waterbody regardless of quantity, must be reported to the Ministry of Environment, Conservation and Parks. Reportable spills have been classified as Category A (major), Category B (moderate), and Category C (minor) depending on specified criteria such as the environmental impact and the quantity of substance released.

During the current licence period (2018-2022), there were no Category A or B spills, and there were five (5) Category C spills.

## Fish Impingement and Entrainment

Impingement and entrainment of fish within the Pickering NGS occurs from the use of lake water in the condenser cooling

water system. In 2018, Pickering NGS was issued a Fisheries Act Authorization (FAA) by Department of Fisheries and Oceans Canada (DFO). The FAA approved OPG to impinge and entrain a fixed number of fish and counterbalance these losses by undertaking an approved offsetting plan, in addition to monitoring of avoidance, mitigation and offsetting measures. The FAA period extends from 2018 to December 31, 2028.

During the winter period, when the Fish Diversion System is removed and relocated to its storage facility, the net components are inspected and repaired as necessary and made ready for deployment the following year.

Routine monitoring of fish impingement is conducted weekly throughout the year. Fish from the screenhouse are collected in bins and trained staff identify the fish species, count them and measure the size and weight of the fish sampled. The estimated biomass of impinged fish is reported annually to the CNSC and DFO



FISH DIVERSION SYSTEM

and reports are posted to OPG's website. Over the period 2018-2022, combined biomass of all species and ages impinged were below the two-year consecutive threshold of 3619 kg except in 2018 and 2019. This exception was reported to DFO as a condition of the FAA.

In 2018, impingement was influenced by above average impingement rates in May, June and October which were all higher than the same months in the previous 5 year period. In 2019, impingement was influenced by above average impingement rates in January, June, November and December. Subsequent investigations determined that none of the exceedances were caused by Pickering NGS operations and were primarily attributed to unusually cold weather and other environmental phenomena.

The Pickering NGS FAA has created three offsetting measures to counterbalance fish impingement or entrainment losses such that a net benefit in fisheries productivity is achieved. The Big Island Wetland, located in the Bay of Quinte, is a wetland fish habitat restoration measure and Fish Habitat Bank. The Simcoe Point Wetland is a combination Habitat Restoration / Enhancement measure situated near the mouth of Duffins Creek. The third offset measure is stocking of Atlantic Salmon into Duffins Creek, which is a component of the broader Lake Ontario Atlantic Salmon Restoration Program.

## **Biodiversity and wildlife habitat stewardship**

OPG has spent decades protecting and nurturing Ontario's biodiversity. It's a fundamental part of our operations

and something our employees are passionate about.

Over the years, we have worked with our partners to help protect and restore biodiversity and the environment, including planting more than eight million native trees and shrubs and stocking more than seven million Atlantic salmon. We continue to contribute to biodiversity conservation through our on-site and regional biodiversity programs, which also support our Climate Change Plan and Reconciliation Action Plan. These programs focus on land stewardship, measuring and monitoring OPG's ecological features, including native and invasive species, and preserving, restoring, and creating habitat for Ontario's native flora and fauna.

## **On-site Programs**

Our on-site programs aim to prevent or mitigate adverse effects to biodiversity. We are also committed to managing our sites in a way that maintains or enhances significant natural areas and protects associated species of concern.

Thanks to these efforts, OPG continues to receive certification and recognition from the Wildlife Habitat Council (WHC) for the on-site biodiversity programs at Pickering NGS. The WHC is an international non-profit group dedicated to restoring and enhancing wildlife habitat. The WHC's certification process helps ensure OPG's biodiversity programs remain flexible and demonstrate continual improvement.

On-site biodiversity initiatives include enhancement of wildlife corridors across



the Pickering NGS site, protection of species of concern like peregrine falcons, and enhancement and protection of the ecological value of the Frenchman’s Bay and Duffins Creek watersheds and associated natural areas on and adjacent to the site.

In 2021, a new 3-year initiative began to remove non-native, invasive phragmites from the Pickering Hydro Marsh with the goal to increase biodiversity in the wetland.

Since 2018, approximately 2700 trees and shrubs have been planted on or around Pickering NGS OPG property by volunteers from the community and OPG staff.

Pickering NGS continues to enhance habitat off site through the ongoing partnership with Environmental Stewardship Pickering (ESP). Projects have included the creation of a wildflower garden at a local school, tree planting events and the creation of habitat structures for birds and pollinators. ESP also hosts educational workshops for community members on gardening, habitat creation and environmental stewardship.

## Engagement and Consultation

OPG is committed to engaging with Indigenous Nations and communities regarding nuclear operations and future projects. OPG’s Indigenous Relations Policy provides a framework for engaging with Indigenous peoples and providing support for community programs and initiatives while respecting Aboriginal and Treaty rights which are recognized and affirmed under s.35 of Constitution Act, 1982.

Engagement on Pickering NGS operations is focused on the Williams Treaties First Nations (WTFN) in whose treaty and traditional territory Pickering NGS is located. Over the course of OPG’s engagement with the WTFN, the perspective that all life is connected has been shared and has helped frame OPG’s approach to various plant and animal species – particularly those that are viewed as “invasive species” by the western world. Gleaning Indigenous

Knowledge is a privilege that is earned through meaningful engagement, and it is gradually achieved as trust is developed. To that end, OPG continues to engage with the rights holders surrounding Pickering NGS to build an understanding of Indigenous Knowledge and values and how they can be incorporated into operational methodologies and practices. Through these engagements, OPG aims to not only share information on our operations but to develop awareness of the potential impacts on the Aboriginal and Treaty rights of the Nations and ways to mitigate those impacts or make accommodations for identified impacts.

Meaningful engagement takes time and effort and OPG is committed to working with the Indigenous Nations and communities to develop culturally appropriate frameworks and respectful protocols that incorporate their priorities and capacity needs.

On August 16, 2021, OPG established a Framework Agreement with the Curve Lake First Nation which allows for dedicated time and capacity funding to support ongoing, regular engagement on OPG's nuclear and renewable generation operations.

Regular monthly meetings were established in 2021 with Curve Lake First Nation through the Framework Agreement, which allowed meetings to occur on a regular basis with a focus on sharing information and updates related to OPG's nuclear and renewable generation operations.

OPG and the Mississaugas of Scugog Island First Nation also entered into a Framework Agreement in the fall of 2022 and work is progressing with Hiawatha First Nation to develop a similar agreement to support regular engagement.

In addition to the formal Agreements that support ongoing engagement, Pickering NGS invited Alderville First Nation, Rama First Nation, Beausoleil First Nation, Georgina Island First Nation, and the Mohawks of the Bay of Quinte to engage on areas of interest including environmental monitoring, Pickering operations and economic and employment opportunities. Further, Pickering NGS has provided information to the Mississaugas of the Credit First Nation, the Métis Nation of Ontario Region 8 and Six Nations, who have all expressed interest in Pickering NGS continued operations and licensing activities.

## **Indigenous Community Meetings**

OPG engages with these identified Indigenous Nations and communities on a regular basis to discuss plans such as ECO as well as station operations, environmental reporting, employment/procurement opportunities and other topics viewed as priorities by the communities. The Indigenous Nations and Communities are included in the external communication plan discussed in Section 4.1.4.

In 2021, the following areas of interest were discussed and addressed with local Indigenous Nations and communities (WTFN, Mohawks of the Bay of Quinte, Six Nations and Métis Nation of Ontario Region 8):

- Waste storage and transportation at Pickering NGS
- Thermal plume at Pickering NGS and potential impacts to fish and habitat
- DFO authorization regarding fish impingement and entrainment
- Pickering ECO timeline
- Pickering Decommissioning timeline
- Environmental Monitoring

Some of the WTFNs have expressed specific interest in the DFO authorization, particularly as it relates to the Pickering NGS end of operations timeline and discussions are ongoing.

In 2022, engagement continued with the Métis Nation of Ontario (Region 8) on Pickering NGS, specifically related to the ECO process. In addition, OPG had discussions with Curve Lake, Scugog Island and Hiawatha regarding Pickering environmental initiatives such as monitoring of fish and groundwater and mitigation efforts in reducing impacts on endangered species.

Discussions were also held with Curve Lake, Scugog Island and Hiawatha on the plans for Pickering NGS with respect to the late-2022 announcement to seek CNSC authorization to operate Pickering NGS Units 5 to 8 to December 2026 and to conduct a feasibility study on potential refurbishment. As well, discussions were had with the Chiefs of the WTFN and the Saugeen Ojibway Nation in advance of the announcement to ensure

they were informed ahead of time.

OPG will also respond to any questions, concerns or comments from Indigenous Nations and communities and peoples from elsewhere in the province as required. OPG intends to continue and improve upon its engagement activities by having more frequent and meaningful engagement supported by existing and future framework agreements with Indigenous Nations and communities.

## **Indigenous Advisory Council**

All the local Indigenous Nations and communities are invited to participate in the Canadian Centre for Nuclear Sustainability (CCNS) and its Indigenous Advisory Council. The CCNS has Pickering NGS and its future at the forefront of its mandate and the Indigenous Advisory Council, launched in April 2021, serves as a body to both receive information about the site and offers advice and guidance to ensure Indigenous participation and perspectives are considered in relation to ongoing operations, projects, employment and business opportunities.

## **Making a Positive Impact**

For 2023 and beyond, an overarching Indigenous Engagement Plan is also being developed by OPG in collaboration with the Indigenous Nations and communities proximate to OPG's nuclear operations which will support the prioritization and resource allocation required to continue meaningful engagement on Pickering NGS's operations.

Throughout the month of June, National Indigenous History is celebrated across Canada with June 21 marking National Indigenous Peoples Day. OPG honours the unique heritage, diverse cultures and outstanding contributions of First Nation, Métis and Inuit peoples and acknowledges and celebrates the progressive relationships and strong partnerships we have built with Indigenous Nations and communities across Ontario.

The Indigenous Circle, established in 1992, is a group of empowered and valued Indigenous employees that promotes awareness and the diversity of Indigenous people both within OPG and externally through involvement in special events, career fairs, and other programs. On June 22, 2023, the Indigenous Circle held a celebration of local indigenous culture at the Pickering Information Center. The event included the Smoke Trail drummers and dancers from Alderville First Nation.



# Public Information Program

OPG understands that our licence to operate depends on maintaining strong relationships based on trust and openness. Building these relationships includes meeting the environmental, social, and economic expectations of Indigenous communities, site communities, and our many stakeholders. We take these expectations seriously and strive to be a good neighbour, partner, employer, and upstanding corporate citizen. Through ongoing and meaningful partnerships and relationships, and by fostering a healthy, safe, and diverse workplace, we are not only establishing a better OPG, but a better future for all.

The public information program proactively provides information to the public and stakeholders on Pickering NGS's operations.

Due to the COVID-19 pandemic, 2020 and 2021 were unique years for OPG's public information outreach program. However, OPG continued to provide community outreach in a number of ways. In 2022, OPG's public information outreach program gradually transitioned back to in person and hybrid programming, with modifications to follow corporate and public health and safety guidelines, as referenced later in this section.

The primary focus area for the engagement activities, in addition to the public at large, includes three

municipalities proximate to the Pickering NGS site including the host community (City of Pickering) and adjacent communities within 10 km of the project (the City of Toronto, the Town of Ajax, and the Town of Whitby). The 10 km radius is consistent with the Pickering NGS DPZ for nuclear emergency planning purposes, an area where residents are most familiar with nuclear plant operations and regularly receive information station and operational updates.

OPG ensures the public and stakeholders with a potential interest in Pickering NGS operations and performance, are provided with relevant information and have the opportunity to share their views and perspectives. Information is communicated in a number of ways based on their interests and preferred means of communication.

OPG regularly and proactively provides information to the public on its facility activities. For operational status changes or unscheduled operations that may cause public concern or media interest, OPG follows a protocol to notify key community stakeholders in a timely manner. OPG maintains a duty on-call organization 24 hours a day, seven days a week.

On a quarterly basis, OPG publicly posts performance reports on station operations on OPG's website. Additionally, since 2014, OPG issues a quarterly Environment report in an easy to read and understandable format.



PICKERING NGS STATION TOUR – 2022

## Community Outreach

Outreach activities to interested groups and communities may include:

- Station tours, presentations, virtual tours and simulator tours to community groups, key stakeholders, industry partners and the general public.
- Each quarter, OPG distributes Neighbours Newsletter for the Pickering NGS, which is distributed to about 120,000 residents and businesses within ten kilometers of Pickering and posted online.
- The Information Centre is available to community groups to host events related and unrelated to the industry.
- OPG’s annual public open house, which is widely advertised with a focus on the nearby community. Staff from OPG and various industry partners are present to answer questions and provide information to participants. OPG hosted a community open house in 2022 following a two-year hiatus due to the COVID-19 pandemic. More than 2,400 people from across the Durham Region and the Province attended the event.
- Pickering NGS’s Stakeholder Relations and Communications continues to provide quality programs within our



OPEN HOUSE AT THE DEC – FALL 2022

host community. Prior to the COVID-19 pandemic, our annual March Break Blitz and Tuesdays on the Trail programs reached thousands of community members throughout the winter and summer months. Since the start of the pandemic, OPG has pivoted to continue to provide free, educational and quality programs through virtual and curbside pickup platforms. Since 2021, OPG's Virtual Power Kids program reached over 120,000 participants. Although the pandemic has been challenging in many ways, OPG has developed alternative ways in which it can continue to engage, share information and build relationships within our host communities. In 2022, OPG returned to its in-person Tuesdays on the Trail

program and has returned to in person March Break programming in 2023.

## Community Committees

OPG works with established local community committees on matters of interest and concern related to our operations and projects. Updates on the status of licensing activities are provided to the committees.

- The Pickering Community Advisory Committee meets regularly to exchange information with community leaders and local residents, who in turn provide advice to senior OPG staff on issues of environmental, economic and public concern.
- OPG has representatives on the Durham



**TUESDAYS ON THE TRAIL – SUMMER 2022**

Nuclear Health Committee and OPG staff make regular presentations on a variety of environmental, community outreach and operational matters. This committee is chaired by the Durham Region Medical Officer of Health.

OPG meets often with stakeholder groups, elected officials and municipal representatives, as well as with stakeholder groups that have an interest in nuclear, safety, energy, climate change, and/or environmental issues.



**PICKERING NGS COMMUNITY ADVISORY COMMITTEE TOUR MARCH 2023**

## Environmental Partnerships and Programs

Pickering NGS is committed to biodiversity work on OPG property and on public lands within the host community. Pickering NGS's biodiversity program continues to provide plantings, pollinator gardens, and numerous other initiatives. More than 2,700 native trees and shrubs have been planted in the vicinity of Pickering NGS since September 2018 by OPG staff and community volunteers.

To further enhance local sustainability efforts, OPG is a long-standing partner of Environmental Stewardship Pickering (ESP) alongside the City of Pickering and the Toronto and Region Conservation Authority. The ESP committee works to organize education sessions/workshops, tree plantings, family nature walks and other programs that are available to community members.

Since 2011, OPG has been a lead partner in the Bring Back the Salmon program with the Ontario Ministry of Natural Resources, and the Ontario Federation of Anglers and Hunters. OPG's support contributes to all four pillars of the Bring Back the Salmon program but is weighted towards fish production. Each year, the Pickering NGS Information Center houses a hatchery and OPG partners with a local school for the program. During non-COVID years, OPG would host the students at the Info Centre and provide a presentation about Atlantic Salmon history in January, as well as organize the release of the fish in June with the school. Since 2021, the program has run virtually reaching thousands of students

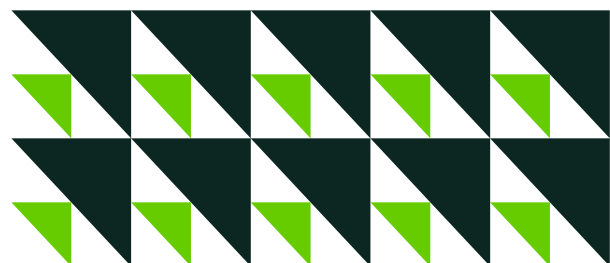
across the province. OPG supported the virtual classroom hatchery episodes with a segment on how OPG generates electricity. In 2023, OPG has returned to running the Bring Back the Salmon program in person.

OPG's Nuclear Operations hold a Gold Level Conservation Certification from the Wildlife Habitat Council (WHC). This achievement recognizes the specific efforts of our biodiversity programs, which aim to protect and nurture species and their habitats wherever the company operates. The WHC certifies conservation programs on corporate lands around the world and promotes environmental management through various partnerships and education.

In 2020, OPG's Pickering Nuclear Generating Station was recognized by the City of Pickering with an Environmental Civic Award for its contribution to conserving and enhancing its natural environment.



**TAKING PRIDE IN PICKERING TREE PLANTING – FALL 2022**



# Operational *Excellence*

Operational excellence at OPG is demonstrated through the safe and environmentally responsible generation of reliable and cost-effective electricity from the Company's assets, by a highly trained and engaged workforce. Workplace health and safety and public safety are overriding priorities in all activities performed at OPG.

The Nuclear Operations Program implements a series of standards and procedures to ensure that the plant is operated safely and reliably. It also supports the alignment, prioritization and resolution of operational

concerns, keeping nuclear safety as an overriding priority.

Due to OPG's continued investment in equipment, training and personnel, station reliability continues to trend positively; and, in some areas, performance has been industry leading.

During the current operating licence term, the station has achieved its best operating performance in station history. Other notable achievements include a record two-year run for Unit 4, which operated for 730 consecutive days before beginning scheduled preventative maintenance in 2021. Most recently, a major station operations milestone was achieved when all six units operated at high-power for a period of 109 days.



This was the longest such run in the history of the six unit operating station.

## **Operating Performance**

The Pickering Site revolves around excellence in the preparation, execution, and learning process for every task. A combination of in-depth education, communication, and observation initiatives fosters a unified culture within Pickering Operations. Central to this approach is the presence of our leadership team in the field, where they observe, teach, mentor, and coach to emphasize vital behaviors and standards that contribute to safe and event-free task execution.

As an organization, the culture of continuous improvement is driven through our Staying on Top culture, supported by our facilitative leadership initiatives. Staying on Top describes the combination of behaviors that are essential to perform at a consistently high level. Operations has aligned crew and department excellence plans with the Staying on Top values with oversight in place through the following forums: Conduct of Operations Review Board, Staying on Top Forum and Crew Improvement Plans to ensure alignment within all levels in the department. The forums provide oversight and alignment with Prepare-Execute-Learn, performance, excellence in standards, training support, succession planning, and GDAR (Gaps-Drivers-Actions-Results).

Through the Plant Status Control (PSC),

Reactivity Management (RM) and Work Protection (WP) working groups and review boards, Operations drive actions that are cross functional and ensure actions are broad enough in scope to improve and sustain performance across all applicable work groups. Focus on communication and identification of risk associated with evolutions and work group low level trends are utilized to identify drivers and associated actions. Improving and strengthening actions for are documented within the Nuclear Performance Area Trending, Prevention and Intervention Process

The Sustainable Operations Plan (SOP) identifies and plans for the anticipated unique challenges and changes as ECO approaches and describes the arrangements and activities that are planned to ensure continued safe and reliable operation of Pickering NGS during the transition to the ECO. The SOP covers the period starting 5 years prior to the final shutdown of the first of the six operating units and ending with the final shutdown of the last operating unit.

## **Organizational Effectiveness**

Organizational Effectiveness is about how effective the leadership team is at aligning the station and driving the right improvement in performance. The effectiveness of the leadership team impacts employee engagement, self-awareness and self-correction, how goals are defined at every level, and ultimately how we align cross functionality to efficiently meet our goals and sustain exemplary performance. Some of the

priorities in 2023 include driving our continuous improvement culture, nuclear professionalism, excellence standards, employee development, strengthening equipment reliability and supervisor effectiveness. All important pieces of a strong performing organization and all aligned to Pickering's priorities of Our People, Our Plant, Our Future.

Pickering NGS has many processes and tools to help us identify, understand, and resolve problems, including frequent thorough assessments and feedback from industry experts such as WANO (World Association of Nuclear Operators) and NSRB (Nuclear Safety Review Board). These activities help us identify gaps, and further build the strengths. We also perform regular benchmarking against other high performing plants in the industry so we can implement the very best practices and aim to be among the best performing plants.

We use event analysis, human performance evaluations, self-assessments, and trend analysis to get to the underlying drivers of any issues and make sure we are solving the real problems. One of the tools PNGS has implemented to drive improvement is GDAR (Gaps/Drivers/Actions/Results). It provides a simple framework to communicate our gaps (where we are vs. where we want to be), and develop actions that address the causes (drivers).

Performance is monitored through observations, which are performed and documented by all supervisors and managers. The observations and

other insights are reviewed at several department forums to ensure action is being taken to correct subtle declines in performance. They are also used to identify station trends and gaps that may require a broader plan to address.

## Outage Management

Outage management ensures event-free inspections, maintenance and modifications in a shutdown state are performed such that plant safety and reliability are maintained at the desired levels during normal operation.

During the current licence term, Pickering NGS adopted a 30-month outage schedule which has been managed in a safe and effective manner and has resulted in the following successes:

- Established a new site record for a six-unit continuous run of 109 days.
- Earned one of the lowest forced loss rates in company history during 2022.
- Reduced dose rates to personnel, including use of dose reduction techniques.
- Human performance planning and Just-In-Time Training integration.

Pickering has an outage improvement initiative that focuses on unit shut down and start up efficiencies. These efficiencies will safely minimize the amount of time required to transition the unit into and out of the outage state, but also focus on additional planning, resources

and oversight over critical evolutions to support safe operation. This will maximize the window for our outage maintenance program and maintain our commitment to supply electricity to the people of Ontario.

## **Major Component Fitness for Service**

The Major Components Program establishes an integrated set of processes and activities to demonstrate fitness for service of Fuel Channels, Feeders, Steam Generators and Reactor Components and Structures, and develops long term life cycle management strategies for continued operation.

This program ensures that major components will perform safely and reliably until the end of commercial operation, maintaining design and licensing bases and operational safety requirements while optimizing production and cost- effectiveness.

Aging Management considerations are applicable throughout the plant life cycle, including design, construction, commissioning and operation. Critical aging management considerations are included and addressed in each of these phases. The basic framework for the Aging Management process is “Plan-Do-Check-Act”. This framework (Figure 13) ensures that planning is in place, the plant is operated in accordance with this plan, the plant condition is monitored, and that action is taken to manage the effects of aging.

The Aging Management Program and the activities it drives are key to ensuring

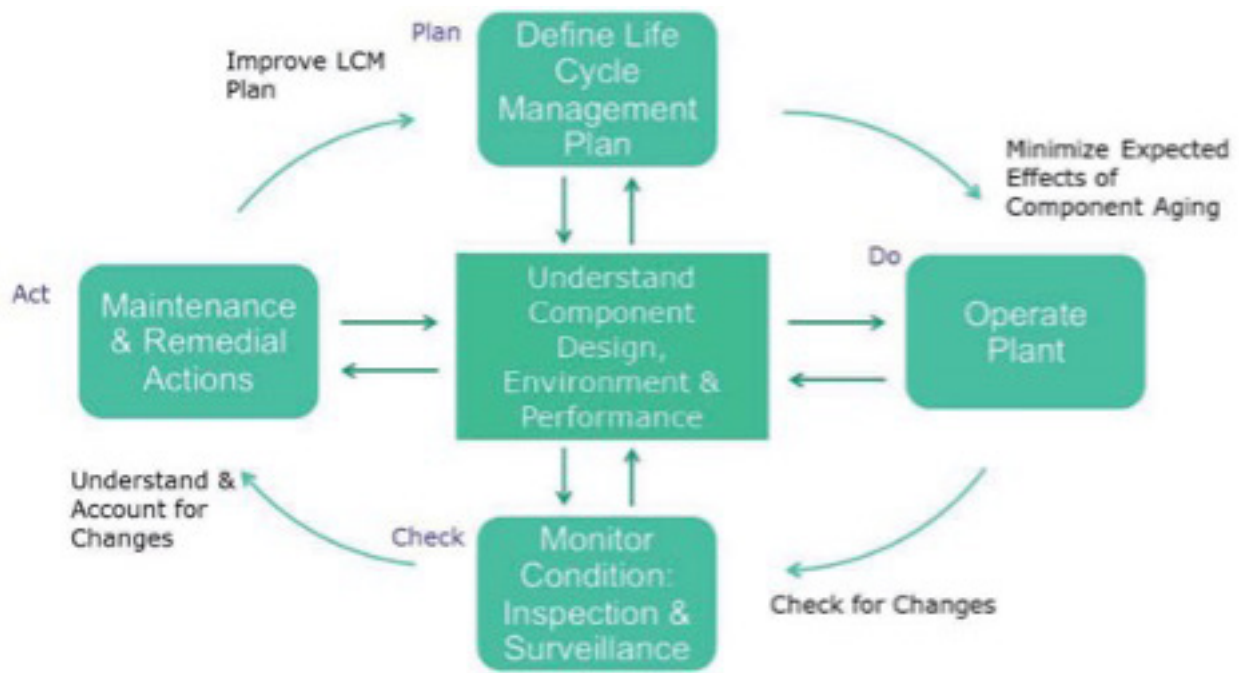
critical equipment aging is managed such that operation of the nuclear power plant remains within the licensing basis of the facility and allows for station safety and operational goals to be met.

To ensure safe operation and fitness for service (FFS) of major components, life cycle management activities are rigorously performed in accordance with industry standards.

OPG produces and regularly updates Life Cycle Management Plans (LCMP) which ensures deliverables are well defined and that activities are planned and coordinated. The plan is optimized based on current understanding and routine assessment of component condition. Execution of the plan allows projections to be made regarding remaining life of the components. This process ensures the effects of component aging can be minimized allowing for the operation of the reactor to target end of life, with mitigating actions implemented as required.

Ongoing FFS for the operational life of Pickering NGS Units fuel channels, feeders and steam generators continues to be demonstrated through in-service inspections and surveillance as per the Life Cycle Management Plans (LCMP).

OPG’s fitness for service programs ensure all equipment is available to perform its intended design function when called upon to do so. The physical condition of structures, systems and components at Pickering remain available, reliable, effective and consistent with design, analysis and quality control measures.



**INTEGRATED AGING MANAGEMENT PROCESS**

## Fuel Channels

The Canadian Standards Association (CSA) Standard N285.4 prescribes requirements for monitoring fuel channel conditions via periodic inspections of multiple fuel channels. This standard also prescribes material surveillance which requires harvesting both small (thin scrape) and large (removal of entire pressure tube (PT)) samples of PT material for subsequent destructive testing at a specialized laboratory facility to confirm material properties. The CSA Standard N285.4 standard defines acceptance criteria that must be met for given fuel channel conditions. If a fuel channel condition satisfies these acceptance criteria, then that condition is considered unconditionally acceptable, as the fuel channel remains within the design basis.

OPG will continue to address the issues related to component aging with high regard for nuclear safety and transparency with CNSC staff. OPG is committed to

ongoing active participation in research and development (R&D) programs designed to improve the understanding of aging mechanisms and improvement of assessment tools and methodologies for the assessment of fitness-for-service. Based on inspections, assessments, R&D work completed to date, confirmatory actions in the LCMPs for assuring ongoing fitness-for-service, and use of mitigating actions where required, OPG is confident of continued safe operation of Pickering NGS Major Components to the assumed service life targets.

The fuel channel program produces fitness-for-service assessments that are aligned with all licensing requirements. Based on the established programmatic controls for managing fuel channel aging, which include an extensive reactor inspection program, sound technical assessments, and the implementation of mitigating measures where required.

## Feeders

The goal of the feeder piping life cycle management program is to maintain the integrity of the feeder piping system until the end of commercial operation through the implementation of the LCMP.

The Pickering feeder piping fitness for service is demonstrated by inspection and assessment activities. Advanced stress analysis methodologies have been used to demonstrate that the required minimum wall thickness can be safely reduced in order to minimize or eliminate feeder replacement resulting from flow accelerated corrosion. Feeder fretting and contact with other components will continue to be closely monitored with visual inspections and with the incorporation of operating experience.

The COG Feeder Joint Integrity Project has produced Fitness-For-Service Guidelines, which are used in addition to American Society of Mechanical Engineers (ASME) codes, providing analysis methodologies as well as acceptance criteria for various feeder degradation assessments. A feeder replacement schedule is developed from the most recent feeder thinning inspections and assessments of remaining life based on minimum required wall thickness, to demonstrate fitness for continued service.

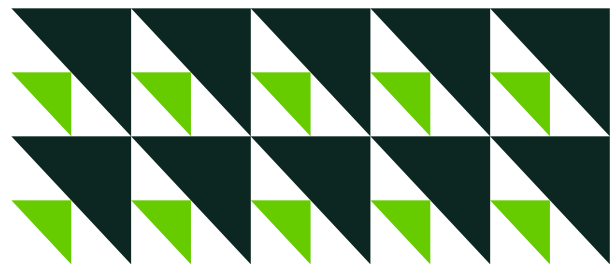
Feeder replacements will continue to be assessed and implemented as needed for Pickering to the end of commercial operation.

## Steam Generators

The primary goal of the Steam Generator (SG) LCMP is to operate all units safely and reliably with the existing SGs over the life of the station. The SG LCMP ensures this critical equipment is understood and the required activities are in place to support safe, reliable component and overall system performance, while maintaining the design and licensing basis. Another key goal of the SG LCMP is to maintain thermal performance.

Steam Generators are closely monitored by an inspection program to manage active and plausible degradation mechanisms. The inspection results demonstrate that life-limiting degradation mechanisms are being monitored and mitigated. The sound inspection and maintenance strategies assist in ensuring compliance with standard CSA N285.4.

OPG will continue to perform in-service inspections in planned outages to verify the condition of the core and to confirm that the unit is fit for service for the planned operating period. If at any time emergent results, research findings, or industry operating experience challenges the validity of existing fitness for service assessments, OPG will evaluate the impact of these results in accordance with internal corrective action processes and licensing basis requirements.



# Waste *Management*

Pickering NGS implements a waste management program that includes strategies to minimize the production of all wastes taking into consideration the health and safety of workers and the environment. Pickering NGS continually strives to improve on safely managing and reducing the amount of Low- and Intermediate-Level Waste (L&ILW) produced, to reduce both the amount and the types of materials that enter the waste stream.

Waste is generated at Pickering NGS as a result of daily operations and



maintenance activities and during planned and unplanned outages. Waste is characterized as either radiological or conventional depending on the radiological zone of its origin and from radiological surveys and analysis.

Pickering NGS continues to meet federal and provincial requirements in processing and disposing of hazardous and chemical wastes.

OPG employs stringent waste minimization and segregation practices to ensure that the volumes of waste processed, transported to and stored at licenced waste facilities is minimized.



# Human Performance

OPG's people are our greatest asset and essential to our success as a company. Their dedication, commitment, and talent are the foundation of our present and future success as a company. That's why our number one priority remains the health and safety of all of our employees. Our goal is to foster a workplace that's welcoming and safe, and to build a healthy, engaged, inclusive, and safety-minded workforce.

The Pickering NGS Human Performance (Hu) department aims to improve human performance at every level of the organization. In this cross-functional approach, each line organization maintains accountability for their Hu, while the Pickering Hu department provides performance analyses, recommendations, and develops initiatives to support continuous Hu improvement.

The station is committed to excellence standards, exemplary safety performance, and high reliability with a strong emphasis on quality observations and coaching, understanding and applying fail safe principles in work-planning, and leveraging leading indicators to correct gaps quickly. These priorities are supported by the human performance program with workshops, training, and analysis and communication. The station has a human performance working group, supported by the station advocate program, to cross-

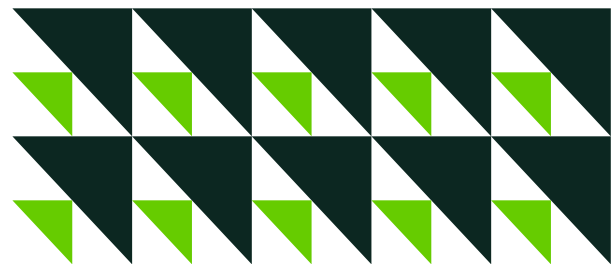
functionally influence change and engage workers and supervisors in developing their leadership skills, knowledge and reinforcement of standards.

As a learning organization, there is a process for event communication and analysis that is frequently used to identify individual or organizational factors that lead to undesirable outcomes. This analysis tool is leveraged across all work groups to learn from events to prevent event re-occurrence.

## Staffing

OPG utilizes workforce planning and resourcing strategies to ensure that the Company has a diverse workforce with the right skill set for the safe and effective operations of generating facilities and successful delivery of major projects and growth and transformation strategies. Risk mitigation includes succession planning, talent attraction and retention strategies, and knowledge management programs to ensure ongoing workforce capability.

OPG expects to continue to meet the human resource needs of the business by developing existing employees and hiring in specific areas, while leveraging attrition through realignment of work and streamlining of processes, where appropriate.





## Security

The Nuclear Security Program ensures the safe and secure operation of the station, maximizing protection against threats to security through the use of equipment, personnel and procedures.

The elements of the Pickering NGS security program include response to threats and maintaining compliance with legislative requirements, while minimizing the adverse impact on staff and plant operations. It ensures security readiness and maximizes response capability to, contain, mitigate, and terminate security events.

While several facets of OPG's security programs are regarded as best practices among private sector organizations, OPG

continues to build strength in identifying areas for improvement by tackling adverse trends and processes to drive continuous improvement efforts.

On an annual basis, OPG reviews its Memorandum of Understanding with Durham Region Police Service. This memorandum defines mutual responsibilities and provides a strong foundation for continued productive and integrated working relationships between Durham Region Police Service and OPG. As well, Nuclear Security continues to maintain excellent working relationships with off-site emergency response organizations.

The security training hiring team typically consists of Managers and Supervisors that reflect the diversity of Security employees and demonstrate OPG's commitment to

Equity, Diversity and Inclusion. The Security process is lengthy, is consistent with nuclear industry peers and is aligned with municipal policing hiring practices. As a result, in 2022, 36 new employees were selected including women and visible minorities. All candidates successfully completed training and were qualified as Nuclear Security Officers pursuant to the standards of the CNSC. Additionally, Security Training demonstrated our adaptability by adjusting to fluid COVID-19 conditions and delivering all portions of the Security Training program including the new hire class.

Programmatic improvements include several strategic initiatives aimed at implementing innovation and technology opportunities. These include, mitigating security impairments with the use of portable camera systems, patrol vehicle fleet electrification pilot, and security clearance system electronic application upgrade. The Security Monitoring System and Entry Control System life cycle project upgrades are actively in progress. Pickering NGS is expecting implementation by early 2024.

Also, a Security Excellence plan (SEM) has been developed to focus on enhancing human performance and improving regulatory compliance. The SEM initiatives are concentrated on significantly enhancing security program performance with focus on managed process, regulatory and procedural compliance, Core 4 event-free tools and intrusive oversight.

OPG believes that these improvements to the program will maintain safe conditions to mitigate security risk to the station.

## Powering the Future

### **Request for Operations of Pickering NGS Units 5 to 8 until 2026**

On September 29, 2022, the Province announced its support for the continued safe operation of the Pickering NGS to 2026. Operating any of the Pickering NGS units past December 31, 2024 is subject to the CNSC's regulatory approval through a public hearing process.

OPG performed additional technical analysis and inspections to confirm fitness-for-service of fuel channels and other major station components in support of operating Units 5 to 8 to the end of December 2026, including confirming the validity of the previously established Periodic Safety Review (PSR) and associated Integrated Implementation Plan (IIP). The PSR, a comprehensive assessment of the station's design and operation, confirmed that there is a high level of safety throughout the continued operation of the station to 2026. In May 2023, OPG submitted the results of the PSR reassessment for operation to the end of 2026 to the CNSC.

In June 2023, OPG submitted an application to request authorization from the CNSC to operate Pickering NGS Units 5 to 8 to the end of December 2026. The operation of Pickering NGS Units 5 to 8 would provide Ontario with a reliable, cost-effective source of baseload energy during a period of refurbishment at the

Darlington nuclear generating stations while avoiding carbon emissions and maintaining several thousand jobs in the Durham region.

## Refurbishment Feasibility Assessment

On September 29, 2022, the Province of Ontario also requested that OPG conduct a feasibility assessment on the potential for refurbishing Pickering NGS Units 5-8.

As of August 2023, OPG completed the assessment stage, which included scope development, initial cost estimates, schedule development, risk assessments, economic evaluations and regulatory strategies. It includes completion of preliminary high-level technical assessments, progress updates, initial financial assessments, industry capacity and capability assessments, and commercial strategies, community engagement and initial discussions with First Nations communities.

If OPG's Shareholder (Province of Ontario) approval is obtained, OPG will begin definition phase project planning of the refurbishment. In the next phase, OPG will further define the regulatory and safety requirements per CNSC regulatory documents. OPG has been having ongoing discussions with the CNSC staff during the feasibility assessment period and will continue to do so during the potential future phases of refurbishment.

## PNGS Transition to Storage with Surveillance State

OPG plans to safely and efficiently transition from ECO to Storage with Surveillance (SWS) state for PNGS. The purpose of SWS is to allow for decay of radioactivity prior to dismantling and demolition of the PNGS units.

The Stabilization activities will commence following the ECO and be completed once the physical and operational transition to the SWS is confirmed. Key Stabilization activities will include:

- Defueling reactors and ensuring adequate measures are in place to prevent refueling;
- Draining moderator and heat transport systems of heavy water;
- Transferring heavy water to long term storage;
- Safe-stating and de-registering of Pickering NGS nuclear SSCs such as fuelling machines, regulating, reactivity, moderator, and heat transport systems;
- Safe-stating and de-registering of Pickering NGS conventional SSCs including turbines and generators;
- Safe-stating and de-registering of Pickering NGS SSCs no longer required for the operation of the nuclear facility, such as heavy water upgraders and common nuclear safety systems and;

- Station SSCs necessary for the SWS phase such as Irradiated Fuel Bay (IFB) equipment, heavy water storage and monitoring, fire protection, environmental monitoring, Heating Ventilation and Air Conditioning (HVAC), active and inactive drainage and active waste management systems will be maintained in an Active Safe State, to the extent required. Systems providing support functions such as water, air and power will also be maintained in service to the extent required by the SWS configuration.

OPG's approach for planning and execution of Stabilization activities and the transition to SWS is based on principal objectives such as nuclear safety, fitness for service, qualified and competent staff, and comprehensive public and Indigenous engagement/consultation.

OPG continues to invest in Pickering NGS to support the above principal objectives, to improve equipment reliability, assure fitness for service for all systems required for Stabilization and SWS, and to ensure nuclear safety remains the top priority. Further, OPG will utilize the experience and lessons learned from Units 2 and 3, which are already in a safe storage state.

OPG implements and maintains plans for ECO for all Pickering units. The plans include a stabilization activity plan (SAP) for transitioning every shutdown reactor unit to the safe storage state or SWS. The SAP describes the arrangements and activities that ensure a safe and efficient

transition from ECO to SWS state for the facility. Given an ECO date of December 31, 2024, OPG submitted the Pickering SAP in 2021, followed by its first annual update in 2022. OPG conducts regular meetings with CNSC to keep staff informed of the ECO plans as part of its regulatory transparency policy.

In addition to satisfying the regulatory requirement, the SAP also provides a valuable mechanism for OPG to summarize the physical changes that will be made to the plant as well as the process and programmatic updates that are required to safely and efficiently transition the station from commercial operations to SWS. The SAP ensures that the various planning elements are aligned internally and that there is alignment with broader strategic goals, such as the decommissioning program outlined in the Preliminary Decommissioning Plan. The SAP also serves as an effective communication tool for internal and external stakeholders.

Stabilization will result in issues and activities that are unique by virtue of their frequency and/or scope. These are referred to as unique challenges. Specifically, a unique challenge refers to an activity, or activity frequency or extent, for the facility that would not otherwise occur were it not for a specific event taking place (e.g., approach to Stabilization activities). Unique challenges may be addressed by existing measures (programs, processes, procedures, etc.) or they may require additional measures (e.g., revision to governance) or actions to be addressed adequately. Unique

challenges associated with each CNSC Safety Control Area (SCA) and associated Specific Areas (SpAs) are identified in the SAP along with the plan to address them.

Contingent on Commission approval to allow operations of Pickering NGS Units 5-8 until the end of 2026, then only Units 1 and 4 will transition to SWS following the end of their commercial operations in 2024. Following shut-down of Pickering NGS Units 5-8 at the end of 2026, the units are planned to undergo Refurbishment instead of safe storage pending the Province of Ontario's approval to refurbish Pickering NGS Units 5-8.

In conclusion, OPG Nuclear governance in combination with ongoing projects, initiatives and actions will ensure that PNGS is operated safely during the Stabilization phase and that Stabilization activities will successfully prepare the facility for a safe SWS phase.

## Conclusion

OPG has demonstrated strong performance and many significant achievements at the Pickering NGS during the current licence term.

OPG will continue to ensure that:

- Nuclear safety will be assured such that plant personnel, the public and the environment are protected;

- Staff are qualified and competent to operate the plant, and this will be maintained through the licence period, including sufficient staffing numbers;
- Impacts of plant operation to the public, workers, and the environment will continue to be of low risk and adequately mitigated, while continuing to provide the various societal and environmental benefits of plant operation;
- Transparency and appropriate public and Indigenous engagement will continue; and
- OPG will continue to invest in Pickering NGS to support the above objectives, including to improve equipment reliability, to assure fitness for service, and to further enhance safety.

Pickering NGS is committed to operational excellence, as evidenced by its efforts to improve equipment reliability and achieve its best operating performance in station history. The station's workforce is highly qualified and engaged, and Pickering NGS considers its employees to be its most valuable asset. To maintain its safety record in the industry's top quartile, continued efforts are made towards improving human performance.

To promote engagement and transparency, Pickering NGS has fostered communication with its neighbors and the Indigenous communities that have a vested interest in the station's safe operation.

With over 50 years of experience operating nuclear stations in Ontario, OPG has built a reputation of safe operations, providing carbon free electricity to the province and has gained the trust of our communities. Based on this strong track record for safety and performance, OPG will lead the way and move forward with our mission to build a sustainable future, powered by our electricity, ideas and people.

Prepared for any challenge, the skilled team at Pickering NGS stands ready to tackle whatever lies ahead. Whether it entails refurbishment of Units 5 to 8 or the safe storage of all units, the residents of Ontario can rest assured that we will diligently accomplish these significant undertakings with safety and precision in mind.







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