

**The Value of Nuclear Energy in
a Post-Fukushima World**

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Introduction

Good morning. I appreciate the opportunity to talk about OPG's nuclear operations and the role of nuclear energy in our society.

Last year more than half of Ontario's electricity came from our nuclear stations: safely, reliably and at a cost that moderated the price of electricity for ratepayers.

The nuclear industry is an important and valuable contributor to electricity, medical processes and the provincial economy. I do not foresee a decline in nuclear energy's importance.

What I do see, is a requirement to validate and learn from recent events that happened half way around the world in a very different geological region. I am referring of course to the events following the large-scale earthquake and tsunami in Japan.

In fact, I believe the industry will emerge from the Japan crisis a safer and better industry. We will evolve from what we were before, for sure. And I will talk more about that in due course. But the fact that nuclear will change should not be a surprise to any of us. This industry has never been a static industry. We've always evolved...always been dynamic...and we'll continue to deliver value.

Changes in the Nuclear Energy Industry – the Road to Performance Improvement

To give you an idea of how much we've changed let me take you back a few years.

I remember my early years as a young engineer. Three Mile Island was still fresh in people's minds. Chernobyl had just happened. The industry was on the defensive.

We had performance issues. Morale was low. Public opinion was sceptical. This was true in the U.S. as well as in Canada.

Sometimes I wondered if I had chosen the right profession.

And we were managing performance issues of our own. One of our stations – Pickering – even became an issue in the 1997 municipal election.

Those were dark days. But the industry recovered and it improved.

In the wake of Chernobyl, the World Association of Nuclear Operators (WANO) was created to maintain and ensure high safety standards for nuclear plants worldwide. New operating practices were adopted. Information sharing procedures were instituted. Benchmarking became more common. Performance gradually and steadily improved – first in the U.S. and then in Canada.

OPG was part of this renewal. We launched a major effort to improve our nuclear performance throughout the first decade of the century. Our focus included:

- benchmarking against best practices,
- improving plant condition and equipment,
- improving our project execution
- reducing backlogs,
- strengthening our maintenance and inspections;
- adopting a rigorous commercial focus; and
- building a comprehensive safety culture embraced by all employees.

Today our nuclear performance is significantly improved compared to what it was in the 1990s. It's not perfect. This is a continuous journey. But it's significantly improved...and continues to improve.

Our safety culture is strong.

So is the performance of many of our reactors. In 2008, four of them finished among the top five performing CANDU reactors in the world.

The year before that, our Darlington station received a major performance improvement award from the Institute of Nuclear Power Operations (INPO) – a first for a Canadian nuclear station.

In 2010 OPG received the ZeroQuest Platinum (Sustainability) Award from the Infrastructure Health and Safety Association for its efforts to sustain and continuously improve its safety performance and management systems.

Our expertise is also in demand. And we have been asked to share our insights with other nuclear operators.

We also enjoy the strong support of our site communities – the result of open and transparent communications, effective community outreach, and solid performance from our plants. During the recent EA hearings into the proposed new nuclear units at Darlington, more than 120 oral and written submissions were made in support of the project. Most of these came from the local community.

The Value of Nuclear Energy

So yes, OPG has evolved and improved...and the industry has evolved and improved.

And because of that, I think, many people recognize the value of nuclear energy and its contribution to Ontario and our world.

Environmental Value: There's environmental value. Excluding hydroelectric, no other source of energy can produce so much clean, baseload power at such sustained levels as nuclear. All of it virtually free of emissions contributing to smog or climate change. In addition, along with our hydroelectric fleet, OPG's nuclear plants provide a solid, environmentally-sound platform on which the Province can build and expand its green energy capability.

Economic Value: There's also the economic value of nuclear. In terms of operational costs, nuclear is one of the most cost-effective large scale forms of energy. Here in Ontario, the competitive price of nuclear is enhanced by the fact that OPG's nuclear plants are also price regulated. This helps mitigate the cost of electricity for millions of Ontarian consumers.

Nuclear also helps create jobs and contributes to GDP. Throughout Canada, over 70,000 jobs are directly or indirectly related to nuclear. OPG alone has about 8,000 nuclear employees. Looking ahead, we plan to refurbish our Darlington station. Darlington has also been selected as the site for new nuclear units. These projects could create thousands of jobs during their construction and add billions of dollars to Ontario's GDP.

Operational Value: Nuclear also has significant operational value. By that I mean value that is based on improved ability to operate and manage nuclear assets. Improvements in such areas as plant and equipment maintenance, plant condition, efficiency and production translate into more predictable performance. This in turn enhances the value of nuclear to do what it does best -- generate reliable, economical baseload power for Ontario's homes, businesses and industry.

Another kind of operational value is based on experience and expertise. For example, OPG has also had extensive experience operating CANDU reactors. Leveraging this experience, we've developed leading-edge tools and processes to enhance the operation of our CANDU units. We're testing and applying many of these innovations now.

We're also looking at sharing and marketing some of these innovations to the broader nuclear industry. This could open up new competitive areas not just for OPG, but for our suppliers and partners -- including Canadian manufacturers. I'm talking about a Canadian based nuclear service industry whose expertise is in demand both domestically and internationally. I think that's a real possibility, given OPG's operational expertise and familiarity with the CANDU.

Fukushima and the Safety Imperative

I want to be careful about getting carried away by my own words. Because I have a concern.

My concern is that the very real value of nuclear energy – of which I’ve only given a few examples – may be discounted, dissipated or lost if we don’t deliver on the most important nuclear value of all. And that is safety.

I don’t mean to imply that we haven’t delivered on safety in the past. If there is any industry committed to safety, it’s the nuclear industry. OPG shares in this commitment.

We have a strong nuclear safety record. This includes employee safety...environmental safety...and public safety. We are active members of WANO and INPO. Our stations are vigorously regulated by the CNSC and regularly assessed through its annual report card on nuclear safety, through licensing hearings and through the presence of CNSC staff on site at all of our nuclear plants. No member of the public has ever been harmed by radiation exposure at our nuclear facilities. Nor have they ever been harmed by our transportation, storage and management of nuclear waste, which we have been safely and successfully managing for nearly 40 years. In the area of employee safety, employees at our stations regularly achieve millions of hours worked without a lost time accident. And our Darlington station has to date gone nearly 10 million hours without an LTA – a tremendous achievement.

But we – and the industry -- have to do even more. We cannot presume anything.

Because our industry is different from other industries. People hold us to a higher standard.

The catastrophe at the Fukushima Daiichi nuclear power plant drove this point home. For the past two months the eyes of the world have been on Japan and on our industry.

To date, I think the industry has responded well.

For example, at OPG:

- We are participating with other Canadian utilities to review and respond to the situation in Japan.
- We have outlined to the CNSC a series of actions to verify the safety of Ontario’s nuclear generating stations.
- We are in regular communication with nuclear organizations around the world and have launched extensive fact-based communications initiatives to keep Ontarians informed and assured about the safety of our own nuclear facilities; and
- Our CEO – Tom Mitchell – has been appointed by WANO to chair a special 14-member, “Post-Fukushima” commission to review the lessons of this event and develop recommendations on an appropriate industry response

In addition, last week we released a preliminary report to the CNSC on lessons learned to date from the Fukushima event. Over 80 OPG staff were involved in this assessment. Our plants were re-examined with respect to the following areas:

- external hazards such as earthquakes, flooding and extreme weather events;
- measures to prevent or mitigate severe accidents; and
- emergency preparedness

The overall conclusion is that our nuclear plant systems are robust enough to withstand significant emergencies.

Having said that, we looked carefully at Japan and identified opportunities where we can improve.

For example, we saw that irradiated fuel bays were an issue in Japan. They caught fire. We have confirmed that our fuel bays for used nuclear fuel are safe. Nevertheless, we are reviewing the impact of previously un-imagined events on them and potential enhancements if necessary.

We also saw that hydrogen production was an issue at Fukushima. In response, we are accelerating installation of passive hydrogen technology (“recombiners”) that will neutralize hydrogen gas following the unlikely event of a severe accident. This technology will not rely on electrical backup power – the failure of which was also an issue at Fukushima.

We are also starting to make changes to our fire response capability should the local community be unable to respond.

We will continue to look at unlikely emergency scenarios and determine potential improvements. A further report will be sent to the CNSC by May 28. And we will develop plans to close any potential gaps by July 28.

The bottom line is that we are looking at ways to address even the most UNLIKELY and IMPROBABLE events – like major flooding and major earthquakes and ensuing emergencies in their aftermath.

And I believe that we – and everyone in the nuclear industry – will have to build a similar approach into their safety cultures going forward.

That’s the minimum.

We are also going to have to continue be open and transparent about our safety measures.

We are going to have to communicate about safety in very detailed ways with the public. People want specifics, not generalities.

We can’t be afraid or reluctant to explore even the most far-fetched disaster scenarios. Exploring these contingencies doesn’t mean they will happen. Or that we are unsafe. It means we’re responsible. And people will understand that.

We also need to broaden the sharing of information and expertise with the rest of the industry worldwide – and support organizations like WANO, which are dedicated to this goal. The nuclear energy industry is an international community. All it takes is a major problem at just one plant, and we all feel the impact. The more members we can get to share and communicate, the better it will be.

Conclusion

There is no doubt that nuclear energy plays a valuable and important role in our society.

Its benefits are many. Its potential is great.

Over the years, nuclear has proven to be resilient, responsive and creative. This is true of nuclear both as a form of energy, as a medical tool and as an industry.

It has improved its performance. It has created jobs and stimulated growth. Its environmental advantages are well known and documented. It can be a source of innovation and technical excellence. This is in addition to its primary role of producing huge amounts of affordable baseload power.

Underpinning all this is safety. Nuclear power is a viable energy option because it has continued to evolve and focus on constantly improving its safety performance.

It has been tested in this area in the past -- with TMI and Chernobyl and 9/11.

We are being tested again today by events in Japan.

Our challenge is to continue to learn from these events – by identifying and applying the lessons they teach us and then making the necessary changes in our operations, procedures and policies

I have confidence our industry can do this.

I have stood in the building at Three Mile Island where the partial meltdown occurred.

I remember the mood of near despair that gripped the nuclear industry after Chernobyl.

I can tell you...based on the many interactions I have had with industry leaders during the present crisis, that the nuclear industry is far better equipped to deal with this event than it was with these other events. The mood is much more positive.

We are resolute. We are focused. We will do what needs to be done.

We may emerge from this experience a changed industry. We have had to change in the past. And I'm sure we will be called upon to change in the future.

But we will also emerge a better, safer and more valuable industry as a result.

Thank you.