

# FREQUENTLY ASKED QUESTIONS



Canadian Nuclear Association  
Association nucléaire canadienne

## ADDITIONAL INFORMATION

### CANADA'S RESPONSE TO THE JAPAN

### EARTHQUAKE / FUKUSHIMA

**DISCLAIMER:** *This document will continue to be updated as the situation in Japan unfolds.*

March 18th, 2011

#### FREQUENTLY ASKED QUESTIONS

##### Q1) WHAT IS THE CANADIAN NUCLEAR INDUSTRY'S RESPONSE TO THE FUKUSHIMA SITUATION IN JAPAN?

Our thoughts go out to the people of Japan and their relatives in Canada, as well as the workers of Fukushima for their efforts to protect people close to the plant. We are watching the situation closely and learning as much as we can as developments occur. The nuclear industry – at home and around the world – will be sharing information related to what happened and what will be happening in the days, weeks and months ahead. As a routine, industry examines its operations and shares best information and practices, as well as science and technical expertise.

Right now, our focus is providing factual, accurate information related to the Canadian nuclear reactor system and the Canadian perspective on this type of situation. Please visit the Canadian Nuclear Association website at [www.cna.ca](http://www.cna.ca) for links to more information related to the safety of the nuclear reactor system in Canada.

##### Q2) WILL THIS INCIDENT HURT CANADA'S NUCLEAR INDUSTRY?

While it's premature to address that question in any detail, I don't believe that will be the case in the long term. Canada's nuclear industry has a strong safety record that spans almost 50 years. There have been no significant incidents in Canada and our nuclear power plants are among the most robust designs in the world with multiple, redundant safety systems. The 71,000 workers in the Canadian nuclear industry are highly trained and qualified professionals in their fields, and the industry is closely monitored.

It is important to remember that the Fukushima reactors withstood the largest earthquake in recorded Japanese history. The current problems were caused by a failure of the backup power system due to damages from a tsunami of unprecedented magnitude.

The industry also appreciates the public has concerns in light of this tragedy in Japan, and our focus right now is to reassure Canadians that Canada's nuclear reactors are safe.

### Q3) WHAT KIND OF SAFETY SYSTEMS EXIST AT CANADA'S NUCLEAR POWER PLANTS?

Canadian nuclear power plants are among the most robust designs in the world – they have built-in, multiple redundant safety systems to prevent damage in the event of an earthquake. Both the actual structures that form containment and the systems important to safety have been seismically qualified – that means they are designed and built or refurbished to meet strict seismic standards.

CANDU reactors are different from the Japanese plants in a number of ways: nuclear power plants in Canada are located in areas without a history of major earthquakes or tsunamis. The Canadian Nuclear Safety Commission (CNSC) has reviewed and inspected these installations and confirms their robustness with regards to potential earthquakes.

As well, all of Canada's nuclear power plant operators have well-established and practiced emergency procedures that include emergency shutdown of the reactors.

Several changes to safety rules in the last decade have added even more redundancies to Canadian reactor safety systems. Now, two onsite backup power systems are mandatory, each self-sufficient and separate from the other. (The Japanese plants had only one.)

Larger inventories of on-site water must be maintained as an emergency coolant. And before any Canadian plant can be licensed or re-licensed, the CNSC requires it to have "two fully capable, independent shutdown systems that will assure that reactors are placed in a safe shutdown state in case of an earthquake."

It must also be noted that Canada's nuclear reactors use a technology very different from that employed in Japan and most other Western countries. Our reactors use natural - rather than enriched uranium, and are cooled with heavy water. This makes Canadian reactors more expensive to start, but much safer in the long run.

We encourage you to contact the CNSC for details about the industry's regulatory oversight related to safety.

**Q4) WHERE IS A GOOD PLACE TO GET ACCURATE, UP-TO-DATE INFORMATION ON WHAT IS HAPPENING IN JAPAN?**

Please visit our website at [www.cna.ca](http://www.cna.ca) for information and regular updates on the situation in Japan and its nuclear fleet as it unfolds.

Please talk to qualified experts and do not be motivated or manipulated by fear, but by inquiry and authoritative information.

You can also follow the CNA on Twitter: @talknuclear

**Q5) HOW IS CANADA’S NUCLEAR COMMUNITY HELPING THOSE IN JAPAN?**

Canada is a member of the World Association of Nuclear Operators (WANO).

WANO is assisting its Japan members through peer support and technical assistance as required.

WANO has established a strategy to manage the information coming from Japan and to coordinate the best possible support from utilities around the world as it is needed.

**Q6) WHAT WILL BE THE LIKELY IMPACTS OF THIS TRAGEDY ON THE CANADIAN NUCLEAR INDUSTRY?**

While we do not want to speculate on any potential impacts, we are confident that the Canadian nuclear reactor system is safe, and has a stellar record. As per the industry’s practice – here in Canada and around the world – we will be sharing information related to the situation at Fukushima in Japan and, as more is known about the technical nature of the situation at the plant, we will be sharing that information and expertise.

We also appreciate that the public has concerns related to safety in the wake of this tragedy. Right now, we believe it is important to put this situation into the context of the Canadian nuclear power system and we want to reassure Canadians regarding the safety of Canada’s reactors.

**Q7) COULD THIS INCIDENT STALL A NUCLEAR RENAISSANCE IN CANADA?**

The Governments of Ontario and Saskatchewan have both reiterated their commitments to nuclear energy and research since the Japanese earthquake and tsunami struck the Sendai region. Nuclear has a role to play in Canada as part of our energy mix because of its very small carbon footprint, and its important role in medical research and applications, and food safety, and its contributions to other industries, and the Canadian economy.

Medical isotopes produced in Canada are used in over 50,000 medical procedures each day in over 65 countries; Cobalt 60 is used to sterilize medical supplies and devices; and nuclear R&D supports materials testing and product improvements.

**Q8) HAS THE NUCLEAR INDUSTRY LOST PUBLIC CONFIDENCE?**

The Fukushima Plant was damaged by a very severe and unusual event that occurred at the end of its design life.

We must be mindful of the fact that the Canadian nuclear industry has an excellent record of providing a broad spectrum of products and services that benefit all Canadians. We are committed to ensuring safety throughout all aspects of our industry and being responsible environmental stewards.

Nuclear energy provides a clean and reliable source of power and is an important part of Canada's clean energy portfolio. Because there are virtually no greenhouse gas emissions from our power generating plants, it does not contribute to global climate change or smog.

The application of nuclear science improves the health and well-being of Canadians through nuclear medicine and food safety technologies. Innovation in nuclear science is also being applied to address a number of societal challenges such as public health and transportation.

The Canadian nuclear industry is made up of over 71,000 Canadians employed directly or indirectly in exploring and mining uranium, generating electricity, advancing nuclear medicine, and promoting Canada's worldwide leadership in science and technology innovation.

Through the efforts of our people, the Canadian nuclear industry is a \$6.6 billion per year industry, contributing \$1.5 billion in tax revenues and \$1.2 billion in export revenues.

**Q9) DO WE HAVE ANY IDEA OF THE TYPE OF ECONOMIC IMPACT THIS EVENT WILL HAVE IN CANADA?**

It is early to speculate on potential impacts. I can tell you that the Canadian nuclear industry is made up of over 71,000 Canadians employed directly or indirectly in exploring and mining uranium, generating electricity, advancing nuclear medicine, and promoting Canada's worldwide leadership in science and technology innovation.

Through the efforts of our people, the Canadian nuclear industry is a \$6.6 billion per year industry, contributing \$1.5 billion in tax revenues and \$1.2 billion in export revenues.

Not investing in our nuclear industry would require us to use less reliable, more emissions-intensive sources of electric power. It would also deny the rest of Canada's people and economy the benefits of jobs, products and services in mining, medicine, research, and a wide range of advanced manufacturing.

**Q10) HOW WILL THIS IMPACT ONTARIO'S PLANS TO BUILD NEW REACTORS?**

On March 15<sup>th</sup>, a spokesperson for the Government of Ontario said that the government remains committed to building two new units at Darlington station in Clarington, Ont.

The Joint Review Panel for the Darlington New Nuclear Project is proceeding with hearings on March 21, 2011.

**Q11) WILL THIS HAVE AN EFFECT ON THE SALE OF ATOMIC ENERGY OF CANADA LIMITED?**

This is a question best directed at the Government of Canada as they proceed with plans to restructure AECL.

We have been clear that we support a structure that will advance the industry and the hundreds of Canadian companies that are part of the CANDU supply chain, to make it more competitive.

We also must emphasize that research is at the heart of our industry. For Canada to remain a competitive player in the global nuclear industry we need investments in R&D to maintain our expertise which is known around the world.

## ADDITIONAL INFORMATION

- Our thoughts go out to the people of Japan and their relatives in Canada during this terrible time, as well as to the workers of Fukushima for their efforts to protect the people offsite.
- It is important to remember that the Fukushima reactors withstood the largest earthquake in recorded Japanese history. The current problems were caused by a failure of the backup power system due to damages from a tsunami of unprecedented magnitude.
- The nuclear industry – in Canada and around the world – has a history of working closely together to share science and technical expertise.
- We also have a history of examining operations and activities to ensure continuous improvements.
- Our industry shares all information - including what other industries might claim to be commercially sensitive - in the name of safety.
- Every piece of equipment, human performance and emergency response action around this incident in Japan will be scrutinized and analyzed by the world's nuclear community. When we fully understand the facts surrounding these events, we will use those insights to make nuclear energy even safer.
- Canada's nuclear industry is working with industry peers and experts around the world and sharing information from the Fukushima situation.
- Our hallmark as a global industry is to incorporate operating experience and lessons learned. When we fully understand the facts surrounding these events, we will use those insights to make nuclear energy even safer.
- Over the coming days and weeks you can expect to hear many varying opinions on the events in Japan and even on our Canadian nuclear facilities.
- Some will be based on fact and will include worthwhile discussion that will make us better for the diversity of opinion that will certainly ensue. Unfortunately, some of what you will hear may not be based on fact.
- Please talk to qualified experts. Do not be motivated or manipulated by fear. As a matter of general philosophy, fear is not a great basis for decision making
- In Canada, the nuclear industry works together to ensure public and worker health and safety, as well as environmental protection.
- Regulators set safety standards, including seismic stability needs; designers design reactors to meet those standards and operators maintain those standards through safe operations and emergency response planning.
- Canadian nuclear power plants are among the most robust designs in the world and have built-in/multiple redundant safety systems to prevent damage in the case of an earthquake.
- All Canadian plants have been designed to withstand potential earthquakes.

- Both the actual structures that form containment, and the systems important to safety have been seismically qualified, which means they are designed and built- or refurbished - to meet strict regulatory standards.
- Nuclear power plants in Canada are located in areas where there is no history of major earthquakes or tsunamis.
- The Canadian Nuclear Safety Commission (CNSC) is the federal agency that regulates the use of nuclear energy and materials to protect the health, safety, and security of Canadians and the environment. CNSC staff is located on site at each of Canada's nuclear power plants and elsewhere across Canada to ensure that nuclear materials are safe and that facility operators are prepared in the event of an emergency.
- The CNSC has reviewed and inspected all Canadian installations to confirm their robustness with regards to potential earthquakes.
- Similarly, waste management facilities are designed to withstand seismic events (as defined under the National Building Code).
- The CANDU design uses the concept of defense-in-depth to ensure that there are many barriers (or layers of protection) to prevent undesirable events or in the occurrence of an event such as an earthquake or other emergency, to mitigate the consequences.
- Types of barriers are: physical (pipes, shielding, buildings built to standards to contain radioactive substances), safety systems (systems that shut down facilities or control equipment; systems that contain radioactivity; emergency core cooling systems) and programmatic (quality management systems, processes and procedures); and operators who are trained for routine and abnormal operations, including emergencies, etc.
- Safety is our industry's number one priority. Canada's nuclear operations have a proven track record of being among the safest in the world.
- Canadian facilities are highly monitored, stringently regulated and continuously improved through the daily efforts of qualified professionals who are committed to ensuring public safety.
- Several changes to safety rules in the last decade have added even more redundancies to Canadian reactor safety systems. Now, two onsite backup power systems are mandatory, each self-sufficient and separate from the other. (The Japanese plants had only one.)
- Larger inventories of on-site water must be maintained as an emergency coolant. And before any Canadian plant can be licensed or re-licensed, the Canadian Nuclear Safety Commission requires it to have "two fully capable, independent shutdown systems that will assure that reactors are placed in a safe shutdown state in case of an earthquake."
- It must also be noted that Canada's nuclear reactors use a technology very different from that employed in Japan and most other Western countries. Our reactors use natural - rather than enriched uranium, and are cooled with heavy water. This makes Canadian reactors more expensive to start, but much safer in the long run.
- Another difference is that a CANDU plant is a little bit of fuel surrounded by lots of water. A boiling water reactor is the reverse: it is lots of fuel surrounded by a little bit of water. If a loss of coolant issue is a problem, then you're going to find out faster with a BWR than with a CANDU.

- Canadian reactors consist of several small diameter fuel channels rather than single, large pressure vessels; meaning the coolant is in contact with the nuclear fuel over a greater surface area. In case of a problem, it may be necessary only to cool a handful of small channels rather than one, large, overheating mass.
- Canada has an exemplary nuclear track record with over 45 years of occupational and public health and safety, and is a leader in the industry worldwide.
- The CNSC is the federal agency that regulates the use of nuclear energy and materials to protect the health, safety, and security of Canadians and the environment. CNSC staff is located on site at each of Canada's nuclear power plants and elsewhere across Canada to ensure that nuclear materials are safe and that facility operators are prepared in the event of an emergency.
- Nuclear operators and personnel are carefully selected, highly trained and qualified, and authorized by the CNSC.
- Over a five year period, certified workers complete about 30 continuing training sessions, including training and testing on simulators that replicate the control room and are capable of simulating normal and emergency operating conditions to ensure that their skills are up to date and they can operate the nuclear power plant safely.
- There are many layers of protection between our nuclear operations and our employees and the communities in which we operate. These layers of protection ensure the safety of our people, our communities and the environment against any potential incident that could be caused by human error, equipment failure, or external risks such as earthquakes.
- Canadian operators have well-planned and practiced emergency responses in place. These are coordinated with provincial and local emergency agencies and responders and are practiced regularly.
- Across our nuclear fleet there is a mix of standby generators, emergency power generators and auxiliary power generators with varying degrees of seismic qualification providing a safety net of redundant power supply.
- For major earthquakes, those occurring once every 1,000 to 10,000 years, all of the seismically qualified generators and some of the non-seismically qualified generators will be available. What this means is we have ensured enhanced redundancy for our back up supply.
- Right now, our focus is providing factual, accurate information related to the Canadian nuclear reactor system and the Canadian perspective on this type of situation. Please visit the Canadian Nuclear Association website at [www.cna.ca](http://www.cna.ca) for links to more information related to the safety of the nuclear reactor system in Canada.