Introductory Remarks to Western Focus Seminar

Duane Pendergast

Chair, Alberta Branch of the Canadian Nuclear Society

Good Afternoon! Welcome to Alberta and this Western Focus Seminar.

The Canadian Nuclear Society started planning for this annual conference nearly two years ago. At the time Alberta industry was booming. Concerns with carbon dioxide emissions were high. The few members of the Alberta Branch at the time thought a conference in Alberta to bring thinking about nuclear technology closer would be timely. Cosmos Voutsinos, our Branch Vice-Chair traveled to New Brunswick to make the case to the Canadian Nuclear Society Council for holding it here. Council concurred.

Having made that decision we realized that typical papers presented at CNS conferences are a little narrow in scope. They might not be comprehensible to those with a broader interest in the integration of nuclear energy into the Western Canadian economy. Titles like, "The crystal structure and elastic properties of pure and dysprosium doped urania" and "Correction in homogenization method for CANDU fuel channel deformation" reflect the dedication of the industry to improving safety and reliability. They don't grab the attention of an engineer needing an economic source of steam for oil extraction.

We sought ways to appeal to an audience of engineers, entrepreneurs and professionals from government and industry in Western Canada and concluded we would seek presentations to supplement the broader appeal of the plenary sessions. The goal was to provide a full conference program for those interested in the application of nuclear energy in Western Canada.

It turns out we created a sort of "Field of Dreams" for nuclear entrepreneurs. The response to our request for presentations has been most gratifying. We've received more proposals than could be accommodated by a single session through the conference and following this combined session we will have two parallel sessions through the rest of the conference. Please note that there are also six sessions of more technical presentations. Some of those may be of interest to you too. There will be some difficult attendance choices.

I recall our conference organizers grappling with the theme for this conference. They came up with "New Nuclear Frontiers". A double meaning was intended in reference to the new geographic area in Canada, as well as new frontiers in the application of nuclear energy.

It seems yet another frontier arises from the rich variety of nuclear technology we will hear about through the Seminar. The program provides visions of reactors sailing up the McKenzie River to the oil sands, reactors arriving by rail to provide the electricity needs

of smaller centers, and even highly portable, possibly airborne, reactors dropping in to provide energy as needed. That suggests the third frontier – bringing all this new technology under an umbrella of safety and licensing standards which will be acceptable around the world.

One is reminded we've barely seen the tip of the nuclear energy iceberg to date and that the potential to provide energy for human aspirations is almost boundless. Coming back to earth, the challenges ahead to make this happen are almost as boundless. My colleagues at the podium, Jim Harvie and Harold McFarlane will provide us some thoughts on the way forward.

Before I step out of the way, I would like to say that the Alberta Branch has made some modest progress in bringing more knowledge of nuclear issues to this frontier. We've talked to several groups, published letters and articles to try and dispel some of the myths surrounding nuclear energy, and elaborated on the opportunities it presents. We've participated in teacher's conventions and science conferences as well as a program to make school children more aware of radiation in their surroundings. We've established a lively nuclear discussion list linked with our colleagues from the nuclear industry. In closing, I ask that you consider joining the Canadian Nuclear Society and our Alberta Branch.

Thank you!

Jim Harvie

President, Canadian Nuclear Society

It's indeed a pleasure to welcome all of you to this Western Focus Seminar, which is an important part this year of our Annual Conference of the Canadian Nuclear Society.

When I look at the program for this seminar, I can see that we are going to have an exciting few days. We have papers on a wide variety of nuclear reactors, both large and small, and encompassing all kinds of different technologies, from our own Canadian CANDU, our French colleagues' Pressurized Water Reactor design, to modular helium reactors and small fast reactors, and just about everything in between.

And we have lots of papers talking about how these reactors can be used to fulfill the needs of people in Western Canada for energy, with of course a lot of attention to applications for extracting the vast amounts of oil that you guys are lucky enough to have in your tar sands, as well as for electricity production in our western provinces. We also have lots of interesting stuff about health effects and community involvement – it's great to see people from your communities here to hear what's going on and to tell us about their perspectives on bringing nuclear technologies to their back yards.

As you may know, my own experience is in the regulatory side of the nuclear industry, so when I look at all the different types of reactors being discussed in these sessions, my first reaction is to wonder how on earth the Canadian regulator, the Canadian Nuclear Safety Commission, would deal with the challenges of licensing new concepts that are so different from what we are used to dealing with in this country. Obviously we would make use of the valuable work that has been done by international organizations such as the International Atomic Energy Agency in developing standards applicable to a broad spectrum of designs, but of course there are formidable challenges in adapting such international standards to fit into national regulatory regimes. And I'm very happy to see that my friend Terry Jamieson from the CNSC is going to present a paper on Technology Neutral Licensing Requirements to explain how all these licensing challenges are going to be overcome.

I'm really pleased that we decided to bring our Annual Conference to the west this year and that Duane and Len and their colleagues have worked so hard on this Western Focus Seminar. I believe that it will give people out here who are less familiar with nuclear technology an opportunity to learn about the nuclear industry, its strengths, challenges, and problems – yes there are problems – and what nuclear energy can potentially do to fulfill the needs of people and industry in the western provinces. And it will give people with nuclear expertise an opportunity to dispel some of the myths about nuclear energy – yes there are myths, misconceptions and misinformation – so that people will be in a better position to make informed decisions about this technology.

Of course, nuclear technology is not new to western Canada. Indeed the Canadian Nuclear Safety Commission has an office right here in Calgary dealing with the myriad of its licensees who use nuclear substances and devices in their work. And lots of people in Western Canada, even those in provinces strongly opposed to nuclear energy, benefit from medical diagnoses and treatments using radioisotopes produced in nuclear reactors. It's a pity that most people only become aware of these important benefits of nuclear energy to our society when they are interrupted, as is the case today with the shutdown of the NRU reactor at Chalk River.

But Western Canada has until now not experienced the benefits of the essentially emission-free electrical power that we get from our nuclear reactors – and hopefully these sessions will help to spread information about this important technology.

But perhaps more importantly, these sessions will give people in the nuclear industry, in Canada and around the world, an opportunity to learn about and to understand better the needs of the western provinces, your technologies, your constraints, and your concerns, so that they can be better equipped to develop nuclear systems that are appropriate to western needs. And it gives nuclear people an opportunity to educate themselves about the specific interests and concerns of people in western communities about nuclear development.

So what role can the Canadian Nuclear Society play in all this? We are not a lobbying organization, although certainly our members are generally people who believe that the

use of nuclear energy is a good thing for our society and for our environment. One of the important objectives of the Society is to act as a forum for the exchange of information relating to nuclear science and technology, and our members have been working hard to help disseminate accurate and factual information about nuclear technology in this province. And, if we are asked, we are prepared to do more to help inform open-minded people in your communities about nuclear technologies and their risks and benefits.

When I look at the program for this Western Seminar I am confident that it will make an important contribution to the exchange of information, and that we will all become better informed about the nuclear industry and about the energy needs of the western provinces.

I wish you all a successful and enjoyable seminar.

Harold McFarlane

International Nuclear Energy Academy

Good afternoon ladies and gentlemen.

I am delighted to be here. Thank you Jim Harvie and Duane Pendergast for inviting me to participate in this Western Focus Seminar and this opening session on New Nuclear Frontiers

Congratulations to CNS for holding this first meeting in Western Canada. It is a beautiful area with many exciting developments.

I live not far down the road in Idaho, just on the edge of the Western Energy Corridor that runs from Utah to Northern Alberta. My wife and I have taken the short drive to enjoy many early fall vacations in Alberta and British Columbia.

At this juncture I am struck by just how international this Western Focus Seminar needs to be. And not just because Alberta is a major exporter of energy.

During the next couple of days we will be discussing the possibility of a sea change in the way the world thinks about nuclear energy: Extending the benefits of clean, safe, reliable nuclear energy beyond electricity supply.

In addition to supplying steam for production in Alberta's oil sands, using nuclear heat for hydrogen production, manufacturing processes, and water desalinization could multiply nuclear's already large impact on avoiding greenhouse gas emissions.

In the US for example, nuclear energy generates almost three quarters of all emission-free electricity, even though it comprises only 10% of total capacity.

For Alberta, application of nuclear energy to oil sands production could mean a dramatic drop in GHG tail pipe emissions.

Concern about climate change is rapidly becoming a unifying factor in international policy. After years of foot dragging, it is startling to see how quickly political forces in the US have recently lined up behind climate change initiatives.

Every independent, respected analysis that I have seen, such as the reports from the World Energy Council, state that nuclear has to be a part of any solution for addressing climate change.

However, the real test will come when investment decisions face the economic realities of the different options and all their associated uncertainties.

While I come from an R&D background, the primary challenges are not something that we are going to fix in the laboratory.

To be sure, there are several technical issues ahead of us, but we have reached a point where the heavy lifting will be done, if it is to be done, by commercial corporations.

That is why I think this conference is so fascinating. We will have the opportunity to hear from some of those companies whose innovation and vision may lead to a new nuclear era.

Much of the focus of this seminar will be on small and medium size reactors for application in Alberta and other parts of Western Canada. Small—not immature—but deliberately small reactors.

One of my assignments in recent months has been to learn more about these systems to understand what, if any, assistance is deserved or required by federal investment.

From that perspective, I am delighted to be here, because there is more content on that subject than I have seen in any other meeting.

So I don’t have any great insight on the issue of nuclear applications in Western Canada. I am here to learn.

The sense that I have is one of tremendous opportunity here in Alberta and in neighboring Saskatchewan.

Not only because of the energy business sector here, but more so because of strong leadership in the public arena. To me this is the catalyst that nuclear energy has been missing in many parts of the world.

To borrow a phrase from the theme of the conference, it would be fitting if this new nuclear frontier were to lead the world into a new age of nuclear applications.

While this is an exciting opportunity, it should not be a signal for unbridled enthusiasm and promotion.

The barriers to entry for previously unproven nuclear energy systems are both very high and very real. A strong confluence of economic, policy and regulatory conditions is required.

So here's my challenge to the participants in this seminar. Let's try to come away with a common understanding of the issues in making this dream of nuclear energy in Western Canada a reality.

What are the economic, technical and regulatory issues associated with each of proposed concepts?

Transparency in understanding and communicating those issues may be a first necessary step on the road to game-changing innovation and international leadership.

Thank you again for having me here this afternoon. I am looking forward to the next two days of the Western Focus Seminar.