

**IEEE April 27, 2004**

**Who speaks for the interests of engineers?**

**Thank you Mr. Chairperson , Fellow engineers.**

## **1. Intro**

In the middle of my term as President of PEO about Dec 2000 Jeremy Cook, acting as the initial Chair for OSPE, and I signed the PEO-OSPE agreement. This agreement created a 3 year start-up funding arrangement in which PEO agreed to provide OSPE with approximately \$2 million per year in a combination of cash and in-kind staff support.

What did we expect?

What do Engineers expect now?

-Einstein quote slide #4

Today's subject matter is not a technical one. It deals with matters that affect the livelihood of Engineers and indeed the wellbeing of all Canadians.

As an overview, this is what I will be talking about.

- Ontario Society of Professional Engineers (OSPE)
- Does Advocacy Make a difference?
- The big picture - Engineering Issues in Canada and impact on Canadians
- Re-organizing OSPE to address real livelihood issues
- OSPE For Engineers (O4E)

The Ontario Society of Professional Engineers is a self-interest body for engineers. Its primary function is to lobby for the economic and social interests of its members. And YES, that very much means a key focus on Engineering incomes - the main focus in my view.

Out of interest, how many here are members of OSPE?

To put the role of OSPE in context we need to zoom out even further. If OSPE is to advocate for engineers, it must do so as part of Ontario and Canada. What is the real value of engineering to Canadians? Does our public know who we are and what we do?

Having established the big picture I will then come back to who is O4E? What are we about? Why do we think we can do a better job at running OSPE?

## 2. OSPE - Can an Advocacy body make a difference?

Slides 7,8,9,10

- slide comparing law, med and engineering advocacy bodies pre OSPE.
- Slide comparing relative incomes

## 3. The Big Picture (slide 11)

So what are we going to do about these conditions? Let's step back to look at the bigger picture.

As engineers, our duty to the public safety has increased immeasurably with modern technology. Literally every aspect of our lives is affected by engineering.

The lay public is in no position to even be aware of potential dangers. It is up to you, as Prof. Engineers to make the difference in using technology to create a safe environment for the people of our society.

I want you to be aware of a further point, usually missed in discussions of the public interest. The principle clause of the Ontario Engineering Act refers to PEO's duties so that the public may be "served and protected". It is the 'served' word that I want you to notice.

Protecting the public means that an engineer will **do nothing bad**.  
Serving the public means that an engineer will **do something good**.

It is very easy to stop bridges from collapsing - just don't build any bridges!

But that is not very useful. Our society is served when we create a new bridge.

We must use our talents to create new works that serve the public interest, that is, that serve the public good. At the same time, we must protect that public by ensuring that these works are safe.

It is our collective responsibility in 'doing something good' that must drive us in using our talents. We apply science and technology into works that are useful to human kind. Through such works we produce the products and processes that create wealth and prosperity for our citizens.

The Canadian Academy of Engineering, in their book "Technological Entrepreneurship and Engineering in Canada" reflects these same ideas in their definition of engineering. I quote,

"Engineering is a profession concerned with the creation of new and improved systems, processes and products, designed to serve human needs as they are expressed by individuals, communities, governments and corporations.

Its central focus is design, an art entailing the exercise of ingenuity, creativity, scientific knowledge, skill, discipline, wisdom and judgement based on practical experience."

The key message here, is that it is engineers who are trained to be the prime movers in commercializing scientific R&D through their innovation.

#### **4. Pace of Change (Slide 12)**

The practice of engineering is rapidly changing. Around 1900, it took about 46 years for 25% of the population to adopt electricity. Recently, 25% of the population adopted the Internet in a mere 7 years. What is important to note, is that 46 years is virtually a whole working career. On the other hand, a 7 year period will occur 5 or 6 times in a working career. The rate of change 50 to 100 years ago was hardly noticeable. But today, it is virtually a fact of everyday life.

The current PEO Act was written around the traditional forms of Civil engineering. Well done for the engineering that flourished in the middle of the last century.

The Academy says the following:

"... the challenge for Canadian engineers is to redirect a century of remarkable innovation largely driven by natural resource and infrastructure development to the more entrepreneurial, knowledge-based and competition-driven innovation that is characteristic of the New Economy.

The innovation process must be speeded up in all sectors by building on existing strengths, particularly in the natural resources and the service sectors."

Today, traditional Civil Engineers account for less than 30% of all new graduate engineers.

What is happening to the other 70%, those partaking in the so called New Economy?

The Academy tells us that (slide 13)

"Canada is the 4<sup>th</sup> largest exporter of Engineering Consulting Services."

At the same time they tell us that

"Canada's trade deficit in high-technology products... is running about \$15 billion a year."

This amount of money is equivalent to several hundred thousand lucrative paying jobs!

Yet even in Civil engineering, new technology CAD tools are available. If a building collapses because of a bug in the CAD design software, who is liable? Such a question would never have been asked in 1984 when the Engineering Act was last revised.

The basic rules of doing business have changed and so have the issues.

Since 1984, we have had cell phones, the Internet and the Gnome project to name but just a few major changes to the way we live our lives and make a living.

(slide #14)

Here is another indicator of the pace of change -

90% of the scientists that have ever lived, are alive today!

This means that the potential rate of scientific discovery in our current generation, is 9 times larger than the entire human history.

(Slide 15: ) This audience is most likely very familiar with Moore's law. The pace of technological change is very evident with computing power geometrically increasing, and costs and size decreasing. All of this creating a technology pervasiveness never before seen in the history of humankind.

New science drives new engineering so we can expect these same growth rates to occur within engineering.

The problem is, that where science can keep itself in a test tube, engineering unleashes that science onto society. It is our role to make something useful for people out of new science and new technology.

But just like the discovery of fire, and our inventions to control it, there is a potential for both harm and good.

And therein lies the challenge to us as a profession.

## 5. Man on the Street

(Slide 16)

What do these facts mean to the person on the street?

This rapid rate of change makes it very difficult if not impossible for the common person to assess the benefits and risks in using a new technology. It is up to us as the profession Licensing the practice of applying science, to ensure that our public derives benefits at the least amount of risk.

We are supposed to know.

We are in a position to advise our governments and our industrial leaders.

In effect, it is possible for the profession to be more relevant now than ever in our history.

## 6. Politicians

Our politicians are probably in the worst position. Examples like Walkerton, air pollution, terrorism, Energy production, and Genetically modified foods are just some of the areas where our politicians are at a loss and we, Engineers, need to take a far stronger leadership role.

We cannot expect politicians to read our minds. Do NOT expect our governments to recognize what we engineers think is so obvious.

They will not, because they can not. We need to help them by providing Leadership.

(slide 17)

In 2001, The Canadian Federal government introduced their Innovation Strategy for Canada. A key idea expressed is the following:

"The private sector in Canada needs to develop more aggressively its capacity to commercialize and adopt technologies to remain competitive." They quote UofT's business school as saying, "Canadian firms... must decide to compete globally and compete on the basis of unique products and processes."

It should not be a surprise to you that these words have the same ring to them as those of the Academy. These Innovation papers are talking about what engineers have been trained to do. Yet, nowhere in these documents is there a reference to engineering and to its crucial role.

The Academy has several explanations for the Canadian Innovation Gap. But it seems to me that our greatest gap is the gulf that persists between the engineering community and our politicians.

A Gap that OSPE is well positioned to do something about.

David Crane, the Toronto Star columnist, in his 2001 PEO AGM address concluded that the government's Innovation Strategy was fatally flawed because it did not address the mechanisms to fulfill its strategy. In his closing statement, he told us that it was up to engineers to make the crucial difference.

## **7. Some Global Economic factors**

Let me show you a few more statistics about Canada that directly relate to the impact that engineers can make.

(Slide 18)

- productivity slide (slide 19)
- R&D slide (20)
- Patent rates (21)

We're in poor shape and the signs show we are getting worse.

## **8. Impact on Canadians**

(Slides 22 to 25 - poverty rates) - see slides

At the 2004 PEO AGM, Dr. Tom Brzustowski, P.Eng., President of NSERC made these exact same points. He went through a detail linkage between engineering work and the creation of prosperity for all Canadians. He also did a word count of several words in the Innovation Strategy and I am relieved to report that he too found the word count for 'Engineering' was 0!

The point being made here is that,  
"A thriving Engineering profession is essential to the economic well being of our people."

## 9. Why is Canada so low? - the Basic Problem

Too little engineering too many engineers.

(slides 26

- Utilization rates - NT story of 4000 grads/yr
- Over supply rates

Basically, Canada does not use the Engineers it has to do Engineering. Our Engineering schools accept the cream of the crop - one needs an 85%+ average to get into engineering. Does anyone really think that such brain power will not find their way into the best return for their value? Our brightest graduates go south to the USA to practice engineering, according to Statistics Canada's Brain Drain report. Others simply leave Engineering. The Academy believes that up to 75% of Canadian engineers do not, strictly speaking, practice engineering.

A break down of recent counts of engineers shows that this is not an unreasonable percentage.

[Nortel Story of 4000 grads per yr hired pre 2001 crash - now what?]

## **10. The Essence of Advocacy for Engineering**

(slide 31)

Clearly the profession needs to do something about these conditions. AS I've already said, outsiders are not in a position to initiate such action for us even though some have tried.

The end result of advocacy activity is a change in the rules that govern our society. This is centered in the laws and regulations of our nation. Hence, OSPE must be first and foremost be a political organization in order to be able to affect such changes. OSPE is successful whenever Parliament passes a new law or a minister issues a new order in Council in favour of Engineers. That is when we hit the target's bull's eye.

Everything else must be supportive of this lobby activity. If it is not, our dart missed the dart board. Often times I feel that we engineers don't even hit the wall that hold's the dart board!

This is the 'stuff' that OSPE must live and breathe, and we O4E do believe that the current board is not doing enough on the critical role of advocacy.

## 11. Who is O4E

-slides on o4e

Engineering issues  
OSPE Operational issues

## 12. Sector Committees

The concept of Sector Committees is to empower engineers in various industry sectors to address the significant livelihood issues that affect them.

One example is the High tech sector which has been badly hurt since the 2001 crash. Now we have a new problem - offshoring.

### 1.1 Offshoring

"February 16, 2004  
By THE ASSOCIATED PRESS  
Filed at 12:32 p.m. ET

*Scores of Western firms have farmed out software development and back-office work to India and other countries, where wages are significantly lower. India is expected to earn \$13 billion from such services for the fiscal year ending March 2004. "*

Clearly, this will have a large negative impact on Canadian engineers. What are we going to do about it?

Sector Committees will help OSPE lead the way by creating the 'message' that needs to be delivered. This message must address the laws and regulations that need to be changed in the interests of Engineers.

## 13. Political Organization Committee - one idea

- Slides to 44
- central lobby - Chap 14 of NAFTA; Principle clause in 1984 Act change

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## 14. External Links

- alliances with all groups and bodies that are stakeholders in Engineering
- this includes
  - PEO
  - PEO chapters
  - The faculties of Engineering
  - The learned bodies like EIC, IEEE etc
  - OACETT
  - CEO

It is far better to lobby along with another group. Gov't likes to act on issues in which all the relevant stake-holders have a common resolution.

## 15. Conclusion

I've spent some time looking at the big picture in order to impress upon you the need for engineers to advocate on their own behalf.

Canadians have lost sight of the value of Engineering. We need to get engineering back into their field of vision. That will raise Engineering value, utilization and compensation. TO NOT do this will doom Canada to continued economic decline.

The issues are real and severe. OSPE must act. The current board is either unwilling or un-able to act. That is why we formed O4E. We are the alternative to the status quo. My presence here today, and the activities of our seven candidates and our supporters demonstrates that we are doing things differently. And we will continue to do so.

It is now up to you. We need your support to form that majority on the OSPE board. If you are a member, vote for our 7 candidates - you have a few more days left. Internet voting is about the only way now to ensure your vote is registered on time.

If you are not a member, join now.

For more information and Links to OSPE see our web site:

[www.devita.com/o4e](http://www.devita.com/o4e)

Thank you. I am open for questions in the time we have left.

## 1.2 O4E

Hist; email exchange; we don't believe that OSPE is doing enough re self-interest advocacy.

Who are candidates?

Some Key supporters - Paul M; Walter B; Pat Quinn; Jeremy Cook;  
See web site for others

## 1.3 Does Advocacy make a difference?

## 1.4 Eng Issues

- Inno gap
- Fed gov's Inno Strategy
- Eng Ut & oversupply
- Collapse of hi-tech - NT eg; hired 4000 new grads/yr pre 2001; what now? - over half our grads cannot find Eng jobs;
- Offshoring
- Consulting 4<sup>th</sup> largest
- We have been running a \$15billion trade deficit in hi-tech = several 100,000's well paid jobs

## 1.5

## 1.6 Over supply of Eng

# of Eng /10000 lab force  
rev'd #'s

immigration

## 1.7 Underutilization

75% not doing Eng  
low income & lack of opportunities in Can  
foreign ownership inhibits real eng for products & processes  
see EUP for detailed analysis

## 1.8 Impact on Canada

- R&D
- Invention %
- Productivity growth

Toronto poverty - quadruple poverty communities in last 10 years

Homeless rate on the rise; over 10,000 young people reported to be on Toronto streets  
Crime rate up 200 to 300 murders

### **1.9 What to be done?**

- OPSE is in ideal position to speak for Engineers
- To date, they have done a poor job addressing the kinds of severe issues that affect the livelihood of engineers and indirectly of all Canadians
- O4E wants to change this

### **1.10 Operational Issues with OSPE**

- leadership
- Sector committees
- POC

### **1.11 Conclusions**

- if member of OSPE - vote for o4e candidates (see web site for more details)
- tell other engineers about o4e
- if not a member, join OSPE now
- volunteer for the hi tech Sector Committee when it is formed