

# **Speech to The University of Toronto 2005 Engineering Science Graduation Dinner**

## **“Pursue the Passion”**

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Ladies and Gentlemen, Distinguished Guests, and Dean, I am greatly honoured to be invited here tonight as your speaker for this august event celebrating the Engineering Science graduating class of 2005 and many distinguished award winners.

As a graduate of the EngSci Class of '78, I'd like to acknowledge the tremendous accomplishment it is to graduate from this fine school. There is a tremendous amount of hard work, talent and fearsome determination needed to survive four years in the University's most demanding undergraduate program. I'm told that every year the bar is raised by the Admissions Department, as the demand for participation in the program far outstrips supply. As a result, UofT is able to attract some of the most talented students in the country. It is impressive that Engineering Science has more than doubled in size to over 850 students during the last decade. The Dean tells me there are 166 of you who hope to graduate this year. So here is my first piece of advice to you tonight – hope is not a strategy!

Tonight I would like to share with you where my career has gone since I stood in your position 27 years ago and highlight some of the signposts that have guided me as a person and a professional during these years.

My career has been greatly shaped by change. As engineers we learn to accept change and we embrace it.

When I reflect upon my undergrad years, I recall that we were required to write our final exams using a slide rule in first year. In second year, a four function calculator was allowed. By third year, an electronic calculator with limited memory was permitted, while in fourth year - anything goes. From a slide rule to a TI-59 in four years!

Back then, the Internet was not even a dream; our computer programs were written onto cards and loaded into mechanical card readers at the central computer center, where computer geeks tended the mainframes as high priests at the information age altar. Woe to the student who dropped his 2,000 cards, while standing in line at the reader!

There are disciplines on the curriculum today that were not even contemplated when I was a student. For example, some 30 students are taking the Nanotechnology option, and an impressive 30% of the student body is enrolled in the bio-medical engineering option, drawing upon some of the finest facilities, faculty and infrastructure in the world. Traditional disciplines, such as electrical, computer, and aerospace remain, while infrastructure, manufacturing and physics have been reconfigured. Gone is the nuclear and thermal program, from which myself and eight others graduated in 1978.

As an impressionable young person then, I was influenced by the events of the times in choosing that course of study. The oil shock of the early 70s led to a tectonic shift in energy markets. This created a flurry of activity in the pursuit of other energy sources, notably nuclear and renewables. There was considerable public support and interest in solar, hydrogen, wind, geothermal, and bio-energy. Huge amounts of money became available for research. The problems were of a global scale. So, with a view like all engineers to make a contribution, I pursued this area with vigor.

My fourth year thesis was on hydrogen storage in metal hydrides, as a possible solution to the hydrogen storage problem that limited widespread adoption. My Master's thesis was on modeling underground heat storage. And I pursued my doctorate in Mechanical Engineering here, under Professor Frank Hooper, then Chair of EngSci, in the area of aquifer thermal energy storage. I had the privilege afterwards of joining Frank in his consulting engineering company, where we worked on commercial systems and undertook some very large government projects for the US Department of Energy, NRC, and others.

I later became the General Manager of a high tech start-up pursuing high vacuum systems with applications in high efficiency solar collection. This was supported by multi-million dollar research funding from the NRC.

We made considerable progress, but not long after we had filed several patent applications, a change in the federal government led to the dismemberment of Energy Mines and Resources in Ottawa and cancellation of funding for our project and countless others like it – shades of the Avro Arrow fiasco – a tragic event that was to affect the Canadian engineering community for generations.

These were indeed the heady days and some of the worst days of renewables research in Canada – but that was a quarter century ago.

Then, I was frustrated to see decisions being made by people who were not technically inclined – but these folks controlled the purse strings.

I was missing something. I recognized that my technical background was just not enough if I was going to make a contribution. But as an engineering grad, I knew virtually nothing about economics and little about business.

In hindsight, it is obvious that the basic economics of renewables were not there. Fossil fuel prices were just too cheap compared to the alternatives. The payback on investment in renewables was measured in decades, not months. Not surprisingly, the renewables research effort was mothballed in the mid 80s and 90s.

We know today that the problem has not gone away, just been deferred. With oil over \$50/bbl and with the new urgency of dealing with climate change, there is a renaissance of interest in alternatives to fossil fuels. But this time, the financial markets are supportive. This market pull, contrasts with the then, government push, and is likely far more sustainable.

Recognizing how ignorant I was of business, I signed up for my MBA at UofT and somehow managed to complete it. At the same time, I was asked to join IDEA Corporation, a venture capital business, created to discover and invest in promising early stage ventures pursuing new technologies. This was groundbreaking at the time, as Canada was a backwater for venture capital. Very few sources of early stage capital were available. Trying to raise money for an entrepreneur was exceedingly difficult and very expensive.

This was a great time for me as hundreds of business plans crossed my desk each month. Inventors of all stripes came out of the woodwork to tell me with great enthusiasm their story to get financial backing. At times, I felt like a judge on a special episode of Canadian Idol for the tone deaf. Here's my second piece of advice – all the rehearsing in the world doesn't matter if you don't have talent! What this showed me was the tremendous creativity and imagination of our citizenry. But it also showed how much more is needed than just an idea and enthusiasm. Careful planning, budgeting, patent and legal protection, administrative support, facilities, personnel, working capital funding, assessment of the competition and the like are needed before an idea ever sees the light of day and finds itself in commercial use. It takes lots of people and tremendous effort to ensure commercial success. Many (most) inventors make terrible managers.

At IDEA, it was exceptionally difficult to give everybody a fair hearing and to find the diamonds in the rough. And it was hard to say no. However, several investments were made and there were several successes in what is a very high risk, but potentially high return business.

That experience and my technology background led to a move to Wood Gundy (now CIBC World Markets), where I became a securities analyst in the High Tech area. This was a different scale of investing – analysis of public companies for large international, institutional investors. To sharpen my financial skills, I obtained my Chartered Financial Analyst designation.

I was recruited soon thereafter by Gordon Capital Corporation, then the largest independently owned investment dealer in Canada, as a Director and shareholder. The scale of investment opportunities became even larger as I became interested in other industries and covered the Conglomerates, Consumer Products, Industrials, and Transportation sectors, along with Technology. I was involved in several financings and Merger & Acquisition projects, such as the bid for John Labatt by Onex, the investment of American Airlines in Canadian Airlines, and countless others, and was recognized as the top-ranked analyst in my field.

In 1995, I joined eight others from Bay Street and founded Newcrest Capital, a leading independent investment dealer. Within a five-year period, we created a high impact culture of integrity and independence. We produced incisive research into most of Canada's leading companies and were involved in many major M&A assignments and financings. Newcrest helped raise billions of dollars in capital for several promising Canadian companies, such as Cinram International (the global leader in digital media replication), Magellan Aerospace (in its acquisition of Bristol Aerospace from Rolls Royce), Canadian National Railways (the Initial Public Offering of North America's best railway), SNC-Lavalin Group Inc. (Canada's largest engineering company), Onex Corporation (in its acquisition of Celestica), Canadian Helicopters Corporation, etc.

We sold this business to the TD Bank in 2000.

Since this success, I have pursued another passion – aviation.

With a little more time on my hands, I took up flying with my son Evan (who tonight celebrates his 16<sup>th</sup> birthday and is a promising engineer) and together we can now get about in a Cessna 206 amphibian plane. This is particularly handy if you want to fly in to that hard-to-get-to fishing spot.

I am intrigued by the changes taking place in the aerospace industry – a major consolidation process is underway, resulting in the re-allocation of capital and resources. There is a great opportunity to participate as a buyer of "non-strategic" assets, as this realignment process occurs.

I founded Reliance Aerotech Inc. seven years ago as a private equity fund focused on promising companies in the aerospace industry. We have made investments to date primarily in the US, the hotbed of aviation. For example, in 2001, I purchased Celsius Aerotech Inc. from SAAB of Sweden,

and grew this business to over 600 persons. With Embraer expanding its presence in North America and anxious to support the rollout of its highly competitive new series of regional aircraft, we successfully sold this business in 2002.

At the present time, Reliance has a workforce throughout North America providing technical support to several leading aerospace companies, including General Electric.

One cannot rest on their laurels however and we anticipate announcing a number of acquisitions in the avionics, precision machining, and helicopter maintenance areas over the upcoming months.

To round out my investing exposure, I became a member of the Advisory Board to a Canada Pension Plan private equity fund, with several hundred million dollars to invest in a variety of industries.

Being with you this evening has given me a good opportunity to look back on my career. And I would like to now share with you some of the signposts that have guided my success.

**Change is inevitable.** Engineers are particularly adept at embracing change – it is in our bones.

**You have to rely on your wits.** Gone are the days where loyal employees can work for a company for thirty years and count on a pension at the end of their working lives. Companies that do not adapt to a changing environment can't raise capital, go out of business or are forced to restructure. This has unfortunate consequences for the workforce. However, the public sector is no different. Departments close. Agencies are wound up. Budgets are curtailed. You have to be creative to secure success.

**Large organizations find it far more difficult to adapt.** The level of politics and organizational challenges rise exponentially with size. Tolerance of mediocre performance creeps in – a reversion to the mean occurs. There are exceptions however, but this requires exceptional leadership – which is all too rare.

But as engineers, who thirst to create value and make a contribution, we tend to seek out the exceptional. We look for the challenge. For me, this was in the smaller to mid-size company, where I felt one could make a difference; where I knew the people on my team. The time between cause and effect was more immediate, the experience more real-time; the pace was intense and unrelenting; the risk very high, but so too were the rewards.

**Engineering is a very humbling profession.** Being an engineer is humbling. Why? Engineers make things work. We keep planes flying, bridges standing, computers running, mechanical heart valves beating, and do so in an environment of ferocious competition, under intense time and cost pressures. It is a very, very demanding profession. Sometimes we make mistakes. However, it is how we deal with mistakes and the process of learning from them that make this profession unique. The profession demands of us the highest technical and ethical standards.

**You are not alone.** I've had the privilege of working with some exceptional senior engineers throughout my career - who fulfilled a mentoring role for me as I attempted to master my profession. Professors Hooper in EngSci and Hoepfner in Mechanical Engineering made a big difference in my life. For this, I will always be grateful.

I trust that many of you were able to connect with your professors, teaching assistants, or administrators – many really care and have a lot to give. This learning process never ends. At some point, it may be appropriate for you to give back and if you are fortunate, be a mentor to someone else.

**The hot technology area today may be cold tomorrow.** Alternative energy, was hot, then cold, now it's very hot. It is impossible to accurately forecast the job market five years from now, let alone over the lifetime of an engineer. I encourage you to develop the skills and experiences that position you for long-term success.

**Diversify your skill and experience set as much as possible.** Learn how businesses work. Learn more about the dollars and cents side of things. You might say, hey, I'm headed for a research career in academia – I'm not interested in money. Many would be amazed at the amount of time our professors must allocate from their research activities in pursuit of research funding. Funding is critical. Money makes the world go around.

**Gain as much life experience as possible.** Life experience enhances judgment. Recruitment managers look for life experience in choosing successful applicants. Judgment is critical.

**Your generation of engineers has several advantages of which there are at least three – the Internet, diversity and meritocracy.**

**First**, the Internet greatly expands the world of research, making it a real-time activity, enabling us to globally communicate ideas and advances in technology, almost instantly. This has a significant effect on efficiency.

**Second**, Canadian society is blessed by an increasing level of social diversity. This enables us to share different experiences, be exposed to new ideas, different perspectives, languages and cultures; all of which makes us richer and stronger. It creates new opportunities for our daughters and sons.

**Third**, we take for granted that we live in a meritocracy. What you contribute, what you have in your head and heart matters far more than where you are from or who your family is. This was not always the case.

But we can't be naïve or complacent. As a nation, Canada faces major challenges. Our manufacturers face incredible competition from offshore suppliers. For example in 2001, Chinese manufacturers became qualified suppliers to GE Energy on 54 part numbers. Over the next three years, more than 500 part numbers were qualified for production in China. This pulled high paying jobs from North America.

Ideas and money have no boundaries. Multi-national enterprises are not constrained by borders in their investment decisions. Why make an investment in Canada if there is a better deal somewhere else? We've got to create value in Canada if we are to continue to enjoy our standard of living. We have to compete on a basis different than simply on the basis of the price of our labour. Ideas and execution make the difference in creating competitive advantage.

I'm told that almost one quarter of the EngSci grads will take graduate level studies outside of Canada. That is terrific, as expanding our horizons and gaining different perspectives is essential. I trust that many of you will return to Canada and make a contribution here to this great country.

Now my last piece of advice this evening.

**Live the Passion.** Whatever it is, do what you really have a passion for, because this passion will sustain you through the challenges and difficulties that lie ahead.

That you chose EngSci demonstrates that you have a passion – a passion for excellence.

The foundation you have built here at this great University will stand you in great stead for the rest of your life.

I wish you every success.

Thank you.