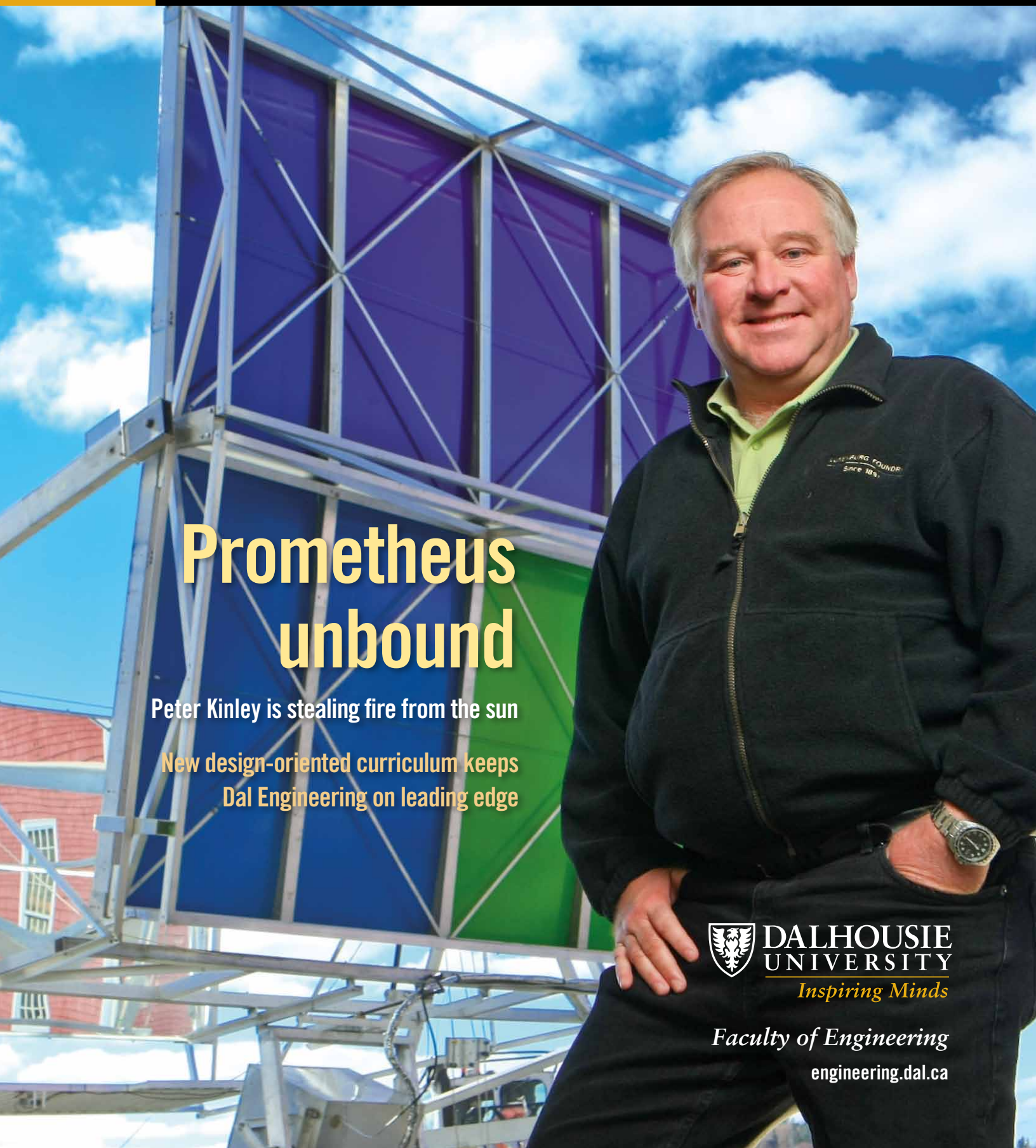
2
Fall 2010

Engineering

More than one hundred years of teaching and research excellence



Prometheus unbound

Peter Kinley is stealing fire from the sun

New design-oriented curriculum keeps Dal Engineering on leading edge

DALHOUSIE UNIVERSITY
Inspiring Minds

Faculty of Engineering

engineering.dal.ca

As we look forward to 2011, we can reflect on 2010 as a banner year for the Faculty of Engineering. With record enrolment growth, increased research and more great alumni events, the faculty has improved on an already-outstanding reputation. Your support is greatly appreciated — the faculty owes much of its reputation to your success.

As you'll see in this publication, the second edition of *Engineering*, our alumni make meaningful contributions to society and are working to solve the issues of today and tomorrow. To keep up with an ever-changing world, we've introduced improvements to our curriculum that ensure continued excellence in Dalhousie's Faculty of Engineering. We hope you enjoy reading about these changes and I encourage you to send us your updates, class notes, stories and more. Have a safe and wonderful holiday season and all the best in the new year.

Dr. Joshua Leon, P.Eng.
Dean of Engineering

Contributors

Editorial: Billy Comeau, Jessica Farrell, Marilyn Smulders, Ryan McNutt, Sean Payne

Photography: Danny Abriel, Nick Pearce, Peter Jones

Design: Dave MacDonald

For more news and events, visit the engineering alumni website at: *alumni.engineering.dal.ca/*

Contact: Jessica Farrell, Alumni & Donor Relations Officer, 902.494.3158
Email: Jessica.Farrell@dal.ca

Clean heat

The Prometheus Project

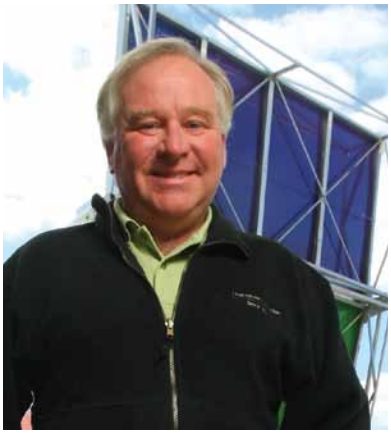
Affordable and clean solar concentration technology

The solar power captured is able to consistently melt aluminum and bronze and has even vapourized copper and iron

Nestled among the colourful waterfront buildings in historic Lunenburg, you will find Lunenburg Industrial Foundry & Engineering (LIFE). Over the last 119 years, LIFE, known widely for its innovation in shipyards, machinery and metal casting, has adapted to survive many economic challenges. Today, it faces a different kind of challenge—high oil prices and global warming. Driven by his interest in sustainable development, Mr. Kinley has invented the first zero-emission solar concentration technology in an affordable package. Known as the Prometheus Project, the device is capable of reaching temperatures as high as an astonishing 2,800 degrees Celsius.

"We wanted to develop a method of heating metal for our castings that was efficient, practical and easy to manufacture without having a negative impact on our environment. Solar power was an obvious choice," explains Peter Kinley, LIFE's President and CEO. "I began searching for a solar technology that would meet our requirements, but to my surprise, realized that it did not exist."

The majority of current solar energy applications are used to heat fluids that



Prometheus inventor and Lunenburg Industrial Foundry & Engineering president & CEO, Peter Kinley, BEng '79.

require relatively low temperatures, or utilize expensive dished mirrors to reflect the sun's energy to a focal point more than 12 metres in the air. LIFE needed a device that could concentrate the solar energy enough to reach extreme temperatures, and reflect that energy back to the ground for the practical purpose of melting metal.

Mr. Kinley, who graduated from NSTC in 1979 with a degree in mechanical engineering before completing a masters in naval architecture and marine engineering, began working on the Prometheus Project in 2006. As Prometheus from Greek mythology once gave fire to humans, Mr. Kinley has found a way to harness the sun's rays for the greater good.

In 2008, Mr. Kinley was granted a patent for Prometheus's 'Kinley Dual Mirror System' that he and his staff developed at their head office in Lunenburg. The simple two-stage method captures the sun's energy on a large mirror and reflects it onto a smaller, parallel mirror. From there, the light is reflected back into a solar concentrator device.

"We were amazed at how quickly the concentrator could reach such high temperatures," says Mr. Kinley. "In the beginning we experimented at my family farm by melting Babbitt metal at 275 to 375 degrees Celsius. After five prototypes, and continuous modifications based on our testing, we continue to exceed our expectations—we are now able to consistently melt aluminum and bronze and have run experiments that have vapourized copper and iron." LIFE's project team has also developed a water heating system that can be plugged into the concentrator platform and is producing super heated steam at about 70 per cent efficiency.

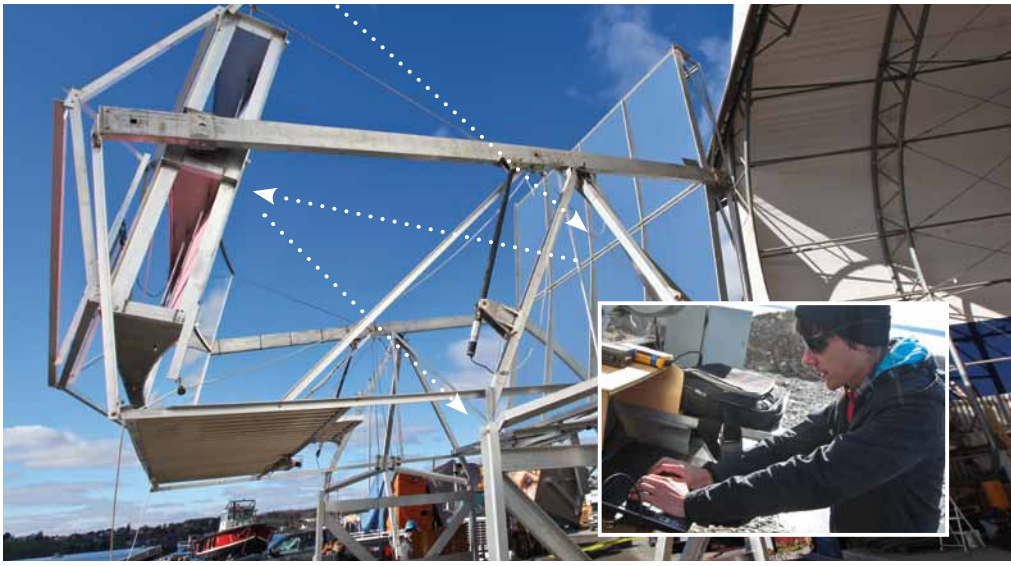
The technology has been so successful in generating clean energy that 'Alberta Innovates—Technology Futures' (formerly Alberta Research Council) has partnered with LIFE to test and verify the company's findings, as well as provide a demonstration location for potential investors. "AITF's testing has been very successful and we are hoping that investors will come on board and utilize the technology to help reduce their carbon emissions in oil sands production or any number of potential applications," explains Mr. Kinley.

Mr. Kinley and his staff, including masters student Garrett Dooley, BEng'08, are also working with Faculty of Engineering professor, George Jarjoura, on a method to optimize the curvature of the mirrors to achieve a tighter focal point—resulting in increased temperature. Additionally, professor Dominic Groulx and his fourth-year mechanical engineering design team are working on a distillation application to produce a desalination system to convert sea water to fresh water for domestic use for the Gamma II, a Prometheus prototype.

In addition to providing LIFE with decades of experience adapting to the variety of niche market requirements of a small town with limited access to resources, Lunenburg provided the Prometheus Project with another unique benefit: its northerly geographical location.

"We are producing clean energy; there are no fossil fuels involved resulting in zero green house gas emissions," says Mr. Kinley. "Nova Scotia is a challenging climate for solar technology; that's why our experimentation here is so vital—if it can work here, it can work anywhere."

The sun's energy is captured on the larger mirror (right) and is reflected onto the smaller mirror (left). The light is then reflected back into the solar concentrator device. Dalhousie student Garrett Dooley monitors the device's temperature increases during testing at LIFE's dockyard on the Lunenburg waterfront.



Doing the right thing

Richard Grant is living proof one person can make a difference. In May, 1992, Mr. Grant (M.Eng '84, TUNS), found himself deeply troubled by the deaths of 26 miners in the Westray coal mine disaster in Pictou County. He was concerned by information uncovered about the oversight and deficiencies that occurred prior to the disaster.

"There were people entrusted to do the appropriate things, and they just didn't do them," says Mr. Grant, owner of Grantec Engineering Consultants Inc. in Hammonds Plains, Nova Scotia. "Those miners shouldn't have been working in that mine."

As a staff member at the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB), Mr. Grant had experience as an advisor of the North Sea regulations and standards for offshore structural safety. He never wanted to see a similar tragedy occur on Canada's offshore.

He began noting deficiencies in offshore standards and regulations hoping that if he could make changes to increase the level of safety, he would. During his time at the CNSOPB and continuing after he left in 2002, Mr. Grant pushed tirelessly for the most stringent regulations to protect the lives of those working offshore and the waters they work in.

"Ultimately, in noting significant issues with respect to fire and explosion safety within the Canadian regulations, I was able to change what was in the standards, thereby changing the regulations (which reference the standards)."

With support from industry and the Canadian Standards Association (CSA), and working with experts from the United Kingdom and Norway, Mr. Grant influenced Canadian standards, and helped bring a higher level of safety to offshore structures all over the world. His work also influenced changes made to the International Organization for Standardization (ISO) standards.

In 2003, Mr. Grant received the CSA Award of Merit for his guidance in advancing of offshore structural standards, one of only three people to have won the award in the last decade within the offshore structures committees.

"I just don't want to see anything like Westray happen again, and if I can help make a change to do that, I'll do that," he says.

An accomplished engineer of nearly 30 years, Mr. Grant began Grantec in 2006, consulting on unique structures, structural dynamics, vibrations, fluid dynamics and response of structures to time-varying loads.

With expertise on advanced stress analysis, Grantec performed the mechanical and structural design of the Sequoia Detector and Sample Vessels at Oak Ridge National Laboratory in Oak Ridge, Tennessee. Grantec's expertise meant they could adhere to the strict specifications, including requirements for the maximum deflections under vacuum and strength requirements like fatigue, collapse and seismic resistance.

One of the largest vacuum chambers built in North America, the Sequoia is part of the Spallation Neutron Source (SNS) project (the most powerful neutron source in the world), funded by the U.S. Department of Energy and considered the world's foremost facility for the study of neutron science.

For this and his many other achievements, Mr. Grant was recognized with the 2010 Lieutenant Governor's Award for Excellence in Engineering from Engineers Nova Scotia.

'Education was the way out'

Dr. Richard Currie is the ultimate proof point of his personal philosophy

He may be one of Canada's most decorated CEOs, but when you get right down to it Dr. Richard Currie owes all his success to his modest upbringing and forward-thinking parents.

"My so-called working class parents always believed that education was the way out," says Dr. Currie, who grew up in Saint John, New Brunswick. "Not only did they encourage me and work very hard to provide me with an education, they also emphasized the need to do more than simply scrape by in life."

Fortunately for the young Mr. Currie, he possessed natural academic ability combined with a good work ethic. The scholarships began to flow during his undergraduate years at the University of New Brunswick (he received financial support from the Lord Beaverbrook Foundation and the Canadian Mathematical Congress) and he soon found himself heading for Halifax and the Nova Scotia Technical College (NSTC), where he pursued a degree in chemical engineering.

Initially he was not enamored of his chosen profession—"Engineering is not simple, it requires perseverance and can be long and exhausting." Dr. Currie does acknowledge that the skills he learned at NSTC helped set the groundwork for a highly successful career. "I hated labs, but they taught me that it is not about what you want to do, but what you must do. There is not a lot of free time in an engineering degree, which emphasized to me the importance of a necessary skill—time management."

Upon graduating from NSTC in 1960, Dr. Currie went to work for Atlantic Sugar Refineries as a process engineer and was promoted to refining superintendent in 1963. However, his career was soon to take an abrupt turn away from engineering and into the world of business. After receiving an MBA from Harvard in 1970, he went on to take a position as a senior associate with McKinsey & Co. in New York.

Just two years later, he was back in Canada, as vice-president of Loblaws—a struggling Canadian supermarket retailer on the brink of failure. Four years later, he became president—a position he held for 25 years—increasing the company's shareholder value by 28 per cent per year, bringing its annual profits to $14 billion and making it one of Canada's largest private-sector employers before he stepped down in 2000. From 1996 to 2000 he was also President of the Loblaw parent George Weston Limited. Retiring from Weston in 2002, the company's share price had increased from $16 to $124 in those six years.

"I had little fear of failure," says Dr. Currie of those years. "I worked hard, took on challenges and ran like hell because there was no turning back. I was always twice as prepared as anyone else in the room—that was important."

That fearlessness—and his willingness to take calculated risks—has earned Dr. Currie numerous awards and accolades. He is an Officer of the Order of Canada, a member of Canada's Business Hall of Fame, and was ranked one of Canada's Top 10 CEOs of All-Time by *The Globe & Mail.* He also holds no fewer than three honourary degrees, most recently an Honourary Doctorate of Letters from Dalhousie University (May 2010)—a unique degree to be granted to a businessman.

"If I had been born a rich man's son, I probably would have been a history professor, but that was not the case," he says. "I have a passion for reading so it was an honour to receive this degree."

Recently retired from his position as chairman of Bell Canada Enterprises Inc. (2002–2009), Dr. Currie keeps himself busy these days as Chancellor of UNB. He also maintains close contact with his scholarship recipients and drives his grandchildren to school each day. A true philanthropist, he has also been involved with several educational and charitable organizations, and recently donated over $20 million to UNB's Richard J. Currie Center, a sports, health and convocation facility, named in his honour.

"I have always felt a responsibility to work hard and give back," says Dr. Currie of his philanthropy. "I subscribe to what Winston Churchill once said, 'You make a living by what you get; you make a life by what you give."

"Education teaches you to think clearly from all sides of an issue in an unbiased fashion," he continues. "Like so many others, I was not automatically entitled to an education. It was a privilege that I had to work hard for and I always keep that top-of-mind."

A new home for water research

For nearly 30 years, the Centre for Water Resource Studies (CWRS) at Dalhousie has been a Canadian powerhouse for water and wastewater research. This includes consulting in the construction of watersheds, helping keep Halifax's water supply clean and safe, and educating generations of engineers committed to the study of water.

Having outgrown its 92 metre square space, the CWRS has a new home on Sexton campus. The water lab opened this past summer and is four times larger than the previous one and has improved an already renowned research hub.

"This new lab elevates our collective research capacity," says Graham Gagnon, director of the CWRS. "Dr. (Rob) Jamieson has a field research site in Truro with the Nova Scotia Agricultural College that is second to none, we have a pilot plant for drinking water studies on Halifax Water's plant site and now this lab serves as the hub for a lot of water research on campus. It's truly a central point to gather various field activities and collect them in one place."

Upgrades include two new fully functional fume hoods and an autoclave for researchers to test water microbiology. While many upgrades may seem basic, Dr. Gagnon says they give Dalhousie greater research potential.

"We now have our entire portfolio, water and waste water research, in one lab," explains Dr. Gagnon, the NSERC Canada Research Chair in Water Quality & Treatment and the Halifax Regional Water Commission Industrial Research Chair. "The new organization of space allows us to buy and use equipment we couldn't otherwise store and we can now do more experiments in one area."

In fact, the new lab was paying dividends even before its completion. This summer, with the lab nearly complete, waste water expert Dr. Jamieson and Dr. Gagnon secured a waste water research project valued at more than $3 million from the Government of Nunavut.

"We wouldn't have been able to if we didn't have this type of capacity," says Dr. Gagnon. "The combination of Dr. Jamieson's field lab and this very high-end analytical lab allows us to go after these types of projects."

"I think the ability for us to carry out that research and translate it to Atlantic Canada is very real. They are very similar communities with similar issues, so if you get something that works in the harsh conditions in Nunavut, it should work here."

The lab also features space to meet with clients, easy access for research transport and room for interdisciplinary study. The CWRS has already begun talks for business relationships with international companies, thanks to the new facility.

The lab is funded by ACOA's Business Development Initiative, Halifax Water (sponsor of Dal's industrial research chair) and Trojan Technologies of Ontario. ACOA granted $1 million towards the construction, Halifax Water added $500,000 and Trojan gave about $100,000 through in-kind donations. The remaining $200,000 was paid by the CWRS.

In addition to Dr. Gagnon, researchers Dr. Jamieson, Margaret Walsh, Craig Lake, Lisbeth Truelstrup Hansen and Lei Liu use the lab for research and education. Halifax Water, a long-time supporter of Dalhousie's water research, and partners from Queen's University are taking advantage of the lab.

High pressure problem-solving

What is the most stressful situation you could imagine?

Try this one on for size: the Macondo well has blown out, killing 11 workers at the surface and spewing thousands of barrels of oil into the Gulf of Mexico. Birds, marine mammals and fish are dying. Oil is heading towards sensitive coastline.

Plans A, B and C haven't worked and BP, the petroleum company based out of London, England, that owns the well, is running out of alphabet. Time to bring in the Canadians.

Three young engineers with the Halifax company Welaptega Marine were back home in mid-July after assisting BP in its efforts to repair the ruptured Macondo well.

James Kesten and Tyler de Gier, who studied mechanical engineering at Dalhousie, spent several weeks at the spill site leading up to the successful capping of the well on July 15. A third Welaptega mechanical engineer, 3-D modelling expert Marie MacCormick worked out of BP's Houston, Texas, office for the duration. She's also a Dal grad.

"BP is already a client of ours, so for me, it was a matter of reminding them that we were here as a resource," says Tony Hall, owner of Welaptega Marine, a subsea engineering support firm specializing in marine imaging technologies for the offshore petroleum industry. "I can't say enough about my people. Here they are in their mid-20s parachuted into an extremely high-pressure situation to help solve one of the biggest offshore incidents in history.

"The quality of the people we get from Dalhousie is phenomenal."

Without going into detail— Welaptega is not authorized to divulge the exact nature of the work—the job was to create a 3D model of the blown well, passing the data on to BP in its quest to plug the gushing wellhead. Working from a ship, Mr. Kesten and Mr. de Gier used a mini-van-sized remotely operated vehicle sent down from ship to get the photographs needed, while on shore, Ms. MacCormick created the accurate 3D models.

"When I first heard what happened, I was thinking that what we do could definitely help," says Mr. Kesten, 25, who first came to work at Welaptega on a co-op placement and was hired after graduation in 2008. "When we finally did get the call, we were choppering into the site less than 12 hours later. It looked like a war zone."

"It was high pressure, definitely," adds Mr. de Gier, 25. "But at the same time, it was all about safety and doing it right. Even so, at the back of your mind, you know what's riding on what you're doing."

l to r : James Kesten, Marie MacCormick and Tyler de Gier behind Welaptega Marine on the Halifax waterfront

Interfacing-off at the Robot Contest

Flashing lights, whirring motors and temperatures in the 30s may put some in mind of a dance club on a Saturday night, but not in this instance. On a sweltering July day last summer, Dal's Sexton Campus gym played host to the 19th annual Robot Contest, held by the Department of Electrical and Computer Engineering.

Peter Gregson teaches third-year Design Methods II where students use their know-how to build a robot with one goal in mind: put out the fire. The class culminates with a contest day and this year the course surface was modeled after a factory in the not-too-distant future. The back-story specifies that these robots are the latest in factory surveillance, capable of keeping facilities secure, including extinguishing blazes.

"Frankly, what you're seeing on the contest surface now does not reflect the ability of their work or their robots for reasons that escape me—life's like that," says Dr. Gregson about the sometimes curious behaviour of the bots.

Fire is represented on the course by an incandescent red lightbulb. Robots don't inherently know redlight bulbs represent disastrous fires. Their engineers have to tell them those sorts of things.

Instead of building the machines from the ground up, teams share a number of similar chassis units with an attached control box—the essential component designed and built by each team of students. Think of the control box as the robot's brain. It is a complex collection of circuits and wires mounted to a platform about half the size of a take-out pizza box. Once a robot finishes its turn on the course, rules stipulate the control box must be removed within one minute to make the chassis available to the next team.

DSU president
– an engineering first

Chris Saulnier knew what he was getting into when he ran for president of the Dalhousie Student Union. Still, he's impressed by the sheer volume of work that goes into working for students.

"You know it's a busy job with a lot to accomplish, but you don't really have a sense of it until you're sitting behind your desk, answering the phone and going to all the meetings," says the 22-year-old—the first engineering student to serve as DSU president.

During the fall term, Mr. Saulnier and the DSU held a successful orientation week, organized several key events for Dalhousie Homecoming and worked to build stronger relationships with the university.

They've also been using fun videos—from a "lip dub" performance to a series of spoofs on the TV show *The Office*—to reach out to students. "We're trying to raise awareness of who we are and how we can help."

Mr. Saulnier says the time spent in engineering, including serving as president of the Engineering Society for first and second years, were key to forming his attitudes towards leadership and community. And he's looking forward to accomplishing more in the winter, including reviewing DSU food services and restructuring the student awards system.

Robot brain is an apt way to describe these control boxes because they make decisions based on how they've been programmed. No remote controls are involved in this competition; the robots are truly autonomous. And that means the design process is complicated.

"What I'm trying to do is get them to use process to show them it's effective to use an appropriately designed process for the task at hand," explains Dr. Gregson. "The bottom line is they're in an incredibly uncertain space because they don't know how to do this, so they're exploring everything. I call that a high innovation design environment."

Design Methods II began in May and students had about three months to design and build their robot control boxes.

"At the beginning we had labs and stuff to learn first, so technically two weeks," says Electrical and Computer Engineering student May Hammad. Asked about their programming strategy, teammate Maya Akbari answers: "Ours is hit and avoid—hit and run away!"

Other teams approach the challenge differently. "The strategy was to avoid blocks and to avoid other robots," says student Esam Turkistani. "But other robots are not fixed, they're moving—it's very hard for us to design."

One robot—sporting a Binford Tools sticker – designed and built by Jesse Allen and Kory Ashford extinguished the 'fire' in all three heats of the competition.

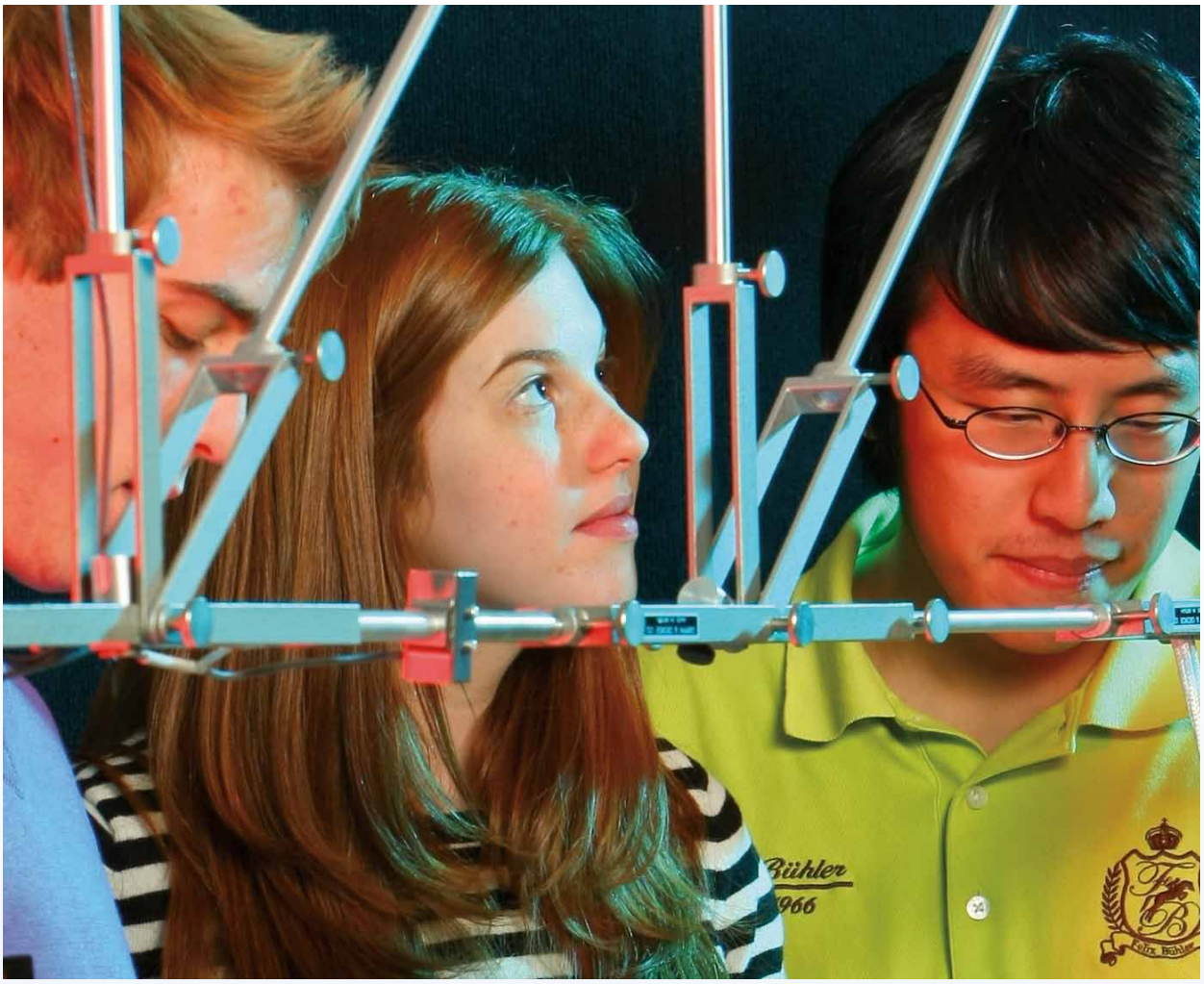
"It went as perfectly as we planned it to, but we were concerned with running into other robots at the intersection there," says Mr. Allen. "We just kind of worked together and made sure that their delay was long enough for us to get through first because we were a little faster."

In the end, team Binford won the 19th annual Robot Contest. Mr. Allen and Mr. Ashford received a complimentary development system (a tool to help develop software). The prize is fittingly furnished by a microchip manufacturer.

Teams were tired at the end of a long day of competition, but spirits were high in the hot and humid gymnasium.

Only Dr. Gregson knows what's in store next year for a 20th anniversary edition of the Robot Contest.

Re-engineered curriculum



In engineering, the pursuit of perfection is not an option but a requirement. The nature of the work—the precision, efficiency, calculation—demand the best as usually millions of dollars and human (or non-human) life rests in the balance.

Because of this, it is vital that engineering education continually become better, more efficient, more precise. At Dalhousie, that's exactly what the Faculty of Engineering is doing. In a May 2008 workshop, faculty, students and industry experts called for curriculum reform for the engineering program.

"We had to ask ourselves what should we be teaching and how do we do it?" says Pemberton Cyrus, associate dean, undergraduate studies for the Faculty of Engineering. "We spent the next 18 months answering those questions."

January 2010 officially marked a new era in engineering education in Nova Scotia as a new core curriculum was approved for the diploma program (first two years of engineering). In the interest of standardization, all the associated universities—Acadia, St. Francis Xavier, St. Mary's, Cape Breton University, Nova Scotia Agricultural College and the University of PEI—were involved in the process and have also adopted the changes.

New courses

To understand modern engineering, one has to know where it has come from. Engineering students will now fully explore the roots of a profession that has profoundly shaped societal evolution in History of Engineering, a two-semester, mandatory course for all students. In addition to understanding where engineering began, what it means and recon-

"One complaint throughout engineering in North America is that engineers can invent things, but they can't communicate their results well," says Dr. Cyrus. "Now, throughout all courses, we enable students to develop their communications skills to help them get their ideas out."

structing historical inventions, students will also be introduced to engineering ethics and why they're important. The new program, designed and delivered by the University of King's College, also places emphasis on writing and is heavily weighted toward developing this skill.

In creating new courses, the faculty wanted to remove unnecessary duplication of content. "It's a balancing act," says Dr. Cyrus. "Some concepts have to be repeated, so we had to decide what is and what isn't worth repeating. The materials that are duplicated must be done intentionally."

To remove duplication from overlapping courses, first-year physics was combined with first-year engineering mechanics. This collaboration with the Faculty of Science also introduces first-year physics students to engineering principles. Not only is the course more efficient, it's more fun with hands-on learning featuring everyone's favourite toy—Lego. The Faculty of Engineering purchased Lego to create miniatures of structures such as bridges and go beyond simply creating and destroying things to understand the factors, such as stress, that must be accounted for in design.

Another innovative combination sees technical communications integrated with design courses. Student project reports are now marked separately for writing and design, and thus, they need to write well.

"One complaint throughout engineering in North America is that engineers can invent things, but they can't communicate their results well," says Dr. Cyrus. "Now, throughout all courses, we enable students to develop their communications skills to help them get their ideas out."

Other new offerings include the combined thermo-dynamics and fluid mechanics course, first-year computer programming (formerly offered in second-year) and Biology for Engineers, designed by the Department of Biology.

Design

To place more emphasis on design, the new curriculum features a design project or course of some kind in every term. A series of steps have been created in design education to develop the student's sense of design right from the start. In their first term they learn to draw, express design and be creative, with no restriction on what they can produce. Then, starting in the second

Continued next page

The new Shell student workshop in the heart of Sexton Campus is an open and visible display of the faculty's renewed focus on design.

(L) Student Brian Joseph dissects a Kitchenaid Mixer to understand its design.

(Below) Chris Wainwright, Loren Bailey and Hsu Chieh-ting analyze stress and strain on a miniature Lego bridge.

term they begin using constraints and must design things that can actually exist under stress, strain and other requirements.

All students must also complete a major design course in their fourth semester (formerly only electrical and mechanical did this) and must follow the whole design process from idea to construction. The goal is that all students will have better design ability as they enter the bachelor program in their third year.

The entire math curriculum has also been reformulated. Four classes are now taught in the first year and are all designed to teach from the engineering perspective. This enables second-year math to be more sophisticated, with a solid foundation attained in first year.

Hands-on

An increased focus on design means an increase in hands-on learning. In addition to the Lego, the faculty purchased 15 Kitchenaid Mixmasters. Thought to be one of the best engineered appliances on the market, students in mechanical and electrical engineering must dissect the devices, understand why and how they were created, then reassemble them to working order.

On the technological side, three 3D Rapid Prototype printers were purchased to make students' designs a reality, albeit small ones. About the size of a fridge, each prototyper is capable of printing a plastic model up to a cubic foot from a computer-created drawing, giving students a sense of what is within the realm of design possibility.

Other features include a new interactive computer lab that makes teaching and group work more visual, the new Shell student workshop equipped with drills, saws and new workbenches surrounded by windows for the whole campus to see and a new multipurpose lab that can be used by almost all engineering disciplines. Each workstation in the lab features capability for power, water, gas, steam and Internet. All benches are on wheels for mobility and one day, with the help of a new building, storage.

Administrative

In addition to improving the educational aspects, the overall program was simplified. Students still complete 22 courses over two years, but those courses are now chosen out of 29 total courses instead of 41. This makes the timetable more comfortable for students and is easier to move between the different disciplines. Dr. Cyrus also says they can likely use fewer classrooms and optimize resources.

"The curriculum is rebalanced from the student's point of view," explains Dr. Cyrus. "We looked at the coursework in every term and tried to make a reasonable mix to give them a workable package for greater learning and efficiency."

"With these changes, we're convinced we'll be producing better engineers."

Out and about *Reconnecting alumni*

The last year has featured many alumni events, reunions, banquets and social gatherings. These all add up to having a good time and keeping in touch with friends and colleagues. Here are a few photos of those who got out and about.

Class of ’60 reunion, Homecoming 2010

Industrial Engineering Class of ’80 reunion

Chemical Engineering Class of ’85 reunion

Chemical & Mining Class of ’80 reunion

More than 100 engineering alumni got together during the annual Calgary Engineering Alumni Lobster Dinner in May 2010.

2nd Annual Engineering Alumni Golf Tournament

Paul Pothier, BEng ‘86, and Jeff Hovell, BEng ‘87, accept the BellAliant & Nova Scotia Power Challenge Trophy, on behalf of the winning company, BellAliant.

Class Notes

Ron Gilkie, BEng '62 (civil), MEng '64, has been appointed Warden and Chair of Camp 7, Halifax – the Corporation of Seven Wardens. Dr. Gilkie has also been appointed a Fellow of Engineers Canada for services to the profession.

Norm Miller, BEng '64 (mining), retired as founding CEO of Corridor Resources in September. He will continue to serve on the Board of Directors.

Alumni, **Wadih Fares**, BEng' 80 (civil), **Rob Bennett**, BEng '88 (electrical), and **Donald Peters**, BEng' 72 (industrial), each received *Atlantic Business Magazine's* 2010 Top 50 CEO award.

Graham Currie, BEng '08 (civil) is the 2010 recipient of the Western Australia Young Engineer of the Year award. Mr. Currie is employed by Lowes Churchill & Associates in Bunbury, Australia.

In Memoriam

Dannie Fong, BEng '56 (mechanical) on May 28, 2010

Laurie Tufts, BEng '52 (electrical) on August 15, 2010

Dr. Andrew Eisenhauer, LLD '09, (Hon) BEng '45 (mechanical) on October 28, 2010

Please send **Engineering Magazine** Class Notes and In Memoriam notices to jessica.farrell@dal.ca.

For submission to **Dalhousie Magazine**, please send to Joanne Ward-Jerrett, alumni.records@dal.ca.

Upcoming Events

January 19, 2011
Engineers Nova Scotia/Dalhousie Engineering Reception
Governor's Pub
Sydney, N.S.

May 14, 2011
Calgary Engineering Alumni Lobster Dinner
Big Rock Brewery

June 1, 2011
Engineering Convocation
Rebecca Cohn Auditorium
www.convocation.dal.ca

Please visit www.alumni.engineering.dal.ca/Events for a complete and up-to-date list of events.

DALHOUSIE UNIVERSITY
Inspiring Minds

Return undeliverable Canadian addresses to:
Alumni & Donor Relations Officer
Faculty of Engineering
1360 Barrington St, PO Box 1000
Halifax, NS B3J 2X4

CANADA POST / POSTES CANADA

Postage paid / Port payé
Publications Mail / **Poste-publications**
40065040