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Waterloo engineering students in race to the future with fuel cell powered design

Publication Date: 08-June-2005
 09:41 AM US Eastern Timezone
 Source: Waterloo University/Natural Resources Canada



WATERLOO, Ontario -- The University of Waterloo has joined 16 other top North American universities as teams of engineering students compete to design the vehicles of the future. The Waterloo team, with a fuel-cell-powered vehicle design, is the only Canadian team in the Challenge X competition being held this week in Detroit. The team is sponsored by Natural Resources Canada and Hydrogenics

Corporation.

"This is an exciting opportunity for young people to be involved in designing the environmental technologies that will define the future of the automotive industry and society," said the Honourable R. John Efford, Minister of Natural Resources Canada. "As a department that encourages the development of innovative, clean energy technologies that address climate change, we are thrilled to be part of this event through the University of Waterloo team."

"We are excited to support the University of Waterloo as the sole Canadian team in the Challenge X competition," said Pierre Rivard, President and Chief Executive Officer of Hydrogenics Corporation. "This innovative competition promotes awareness and education of the benefits of hydrogen and fuel-cell technologies among an important demographic -- the leaders and consumers of tomorrow." Challenge X is a three-year competition sponsored by General Motors Corporation and the U.S. Department of Energy. It focuses on the re-engineering of a General Motors (GM) crossover sport utility vehicle. The competition helps hundreds of highly skilled engineers develop a greater awareness of more energy-efficient and "greener" automotive technologies -- preparing them to lead the automotive industry in the 21st century.

The four-day event at GM University from June 5 to 8 marks the end of the first year of the competition. The finale will culminate with an awards ceremony on June 8 and a vehicle-donation ceremony on June 9 at GM's Milford Proving Ground, where teams will "earn their keys" to the new

2005 Chevrolet Equinox. Years two and three of the competition will be held at the end of the 2006 and 2007 academic years to showcase the teams' learning and vehicle development from year to year.

"This competition gives students hands-on design and engineering experience," said Dr. Roydon Fraser, advisor for the University of Waterloo team and a professor of Mechanical Engineering. "Our students have worked hard this past year exploring vehicle solutions that will reduce energy consumption and decrease emissions. Now our team must prepare to apply what they've designed on paper and in simulation programs to the actual vehicle." The University of Waterloo vehicle is unique in that it is the only one to use fuel cells for propulsion. Two other entrants are using fuel cells for auxiliary systems.

The Government of Canada's approach to climate change is focused on making the right choices for Canada. Half of every individual Canadian's greenhouse gas emissions come from driving. Initiatives such as Challenge X are important because they help reduce emissions and ensure that the actions taken today produce long-term results, while maintaining a strong and growing economy. For additional information about the Challenge X competition or to learn the results of the first year of the competition (after June 9), please visit www.challengex.org and <http://www.uwaft.uwaterloo.ca>.

Competition Blog

Year One Competition Blog

Day 1 (June 5th)

After spending the morning packing the vehicles, we arrived in Detroit at approximately 5:30 pm on Sunday. We checked in at the Mariot Courtyard and rushed to get changed for the reception. At 6:30 pm, we arrived at the reception. We had Mexican food for dinner during which speakers explained the competition schedule. Dinner was followed by a karaoke contest. Having less talent than the rejected contestants of Canadian Idol, we managed to sing a modified version of "If I had a million dollars" by the Barenaked Ladies. We came away with 3rd place! It must have been all our late night practices courtesy of the Silver Spur. It's going to be a busy night as we all work on our presentations. We'll be at GM University at 8 am tomorrow morning.

- Alain Boutros, Outreach Coordinator

Day 2 (June 6th)

Well, the first full day of competition is over! Most of the simulation booth was set up, and thanks to a massive stroke of good fortune and incredible forethought the dynamic simulator became fully operation! So hopefully we'll be able to blow the socks off the judged during the project initiation event tomorrow. We're just tuning our display tonight and should be fully ready to go.

Today was also the live modeling event. UWAFT put in a really strong performance, developing a control strategy that was 25% better than the initial control strategy that was given. The performance should put UWAFT within the top five universities, possibly in the top three.

Tomorrow's a big day, with Project Initiation, NI, Freescale, and Mathworks presentations. Best be getting back to work...from Detroit, Over and Out.

- Matt Stevens, Team Captain

Day 3 (June 7th)

Well, today's we broke out record for getting to the competition early. MOST people woke up before 6 am and we got to the competition by 7:15am. That was pretty good considering some people got like 2 hours of sleep and some people, like Matt, got none.

Our first presentation, Project Initiation Approval (the important one), was at 9:40 am. We scrambled to get our whole trade show booth ready to roll, putting up the plasma screen and setting up our car simulation and webcams. The PIA presentation went really well with all of our bases. We were able to demonstrate a good amount of our hardware for the group of 11 judges, and they thought it was just absolutely fantastic that we had basically a 1/65th version of the proposed vehicle working in front of us (especially with half of it working over WAN).

The other presentations, like Freescale, NI (Labview) and Mathworks, took place today. We conquered them all with great skill. The NI people loved us so much they brought in a film crew later to film our presentation to include in some of their promotional videos. In Mathworks, the judges asked tough questions but Kuo-Feng was on the ball. The judges were impressed.

After the presentations, Dr. Fraser persuaded some of the people (Matt, Dave, Chris M) to go home and sleep. The rest of the team held an open house where all members of all teams interacted with each other and checked out each others presentations.

In late afternoon, we had a dinner hosted by the sponsors. It was great to get a chance to talk to them. And now, we're back in our hotel rooms getting ready for another awesome day of competitions. Yup...

- James Goh, Co-radar

Good evening Waterloo! Today was a great day. Taylor, Chris and I left GM University for Milford Proving Grounds at 9:45 am. The site was awesome - 4000 acres of testing facilities and test tracks. First, we were given a tour of the emissions test facilities and then we were driven to the "Black Lake" where we had lunch with some of the organizers and members of the Wisconsin Madison team. The Black Lake is a huge concrete track with black tiles that are sprayed with water to test slippery conditions. After lunch we were driven to the emissions facility and I got a chance to drive the dyno; they had an Equinox mounted on a dyno and I was told to drive a certain track. I made 3 violations... oops. Then we were taken back to the Black Lake in an H2. The ride was awesome. The driver showed us the different tracks on site: the oval track, a 5 mile circle track, a Hummer track (swamps, logs...), a marble track, different grades, etc. Chris got to drive around the Lake in the equinox.

We got back to GM University at 3:15 pm. It was an awesome experience! I look forward to going back there on Thursday for the vehicle donation. They've hinted that we'll get see corvettes pulling off some sweet moves on the Lake.

- Alain Boutros, Outreach Coordinator

Day 4 (June 8th)

6:30 pm

Well, today was the big day for Outreach. We were first to present at 8 am. The presentation went

well, we'll find out how well in a couple hours. I headed back to the hotel for a 10:30 am phone interview with Transport Canada. That also went well. So far it's been a good day and I hope it ends that way. The other presentations, technical and controls, were also really good. After cleaning up the classroom at GM University, we headed back to the hotel for a swim.

Now, we've just arrived at GM's Centerpoint Campus North for the awards ceremony. I'm walking in right now while firing this off on my blackberry.

Look for an update in 3 hours. Pray for us Waterloo...

- Alain Boutros, Outreach Coordinator

9:30 pm

We did it!!! University of Waterloo's Alternative Fuels Team gets FIRST! Wow, I can't believe it. All our hard work has paid off. I'll write more later...it's time to celebrate. Congratulations everyone!

- Alain Boutros, Outreach Coordinator

Day 5 (June 9th)

Well, the last day of Challenge X was much more relaxing. After a long night of some celebrations, we somehow managed to wake up, pack and leave the hotel by 8 am. We arrived at Milford Proving Grounds at 9 am and got shuttled to the Black Lake. First on the agenda was an hour of networking with the main sponsors followed by the media event. In front of all the media, we were given the key to our 2005 Chevy Equinox...unfortunately for Matt the key was just for show.

The media event was followed by a barbeque, some vehicle demonstrations (acceleration, traction control...) and lots of pictures and interviews for the first place team!

We're now on our way home...

- Alain Boutros, Outreach Coordinator



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