Mississippi State University

Challenge X Outreach Team

Year 2

Update #4 - Final

Submitted at End of Year Competition

Reported by:
Amanda McAlpin – Outreach Coordinator, Dedicated
Bill Bain
Ashley Priebe
David Oglesby

MSU Challenge X Team Outreach Efforts, Year 2

Year 2 for the MSU Challenge X outreach team has been filled with presentations, special events, and increasing media coverage.

Our outreach team is organized with a dedicated outreach coordinator, Amanda McAlpin. On the team also are Bill Bain and Ashley Priebe, the K-12 chair.

Community and Media

The outreach team has been diligent with community outreach by organizing events, speaking to groups, and maintaining sponsor relations.

We began the year with a vehicle donation ceremony aimed at the media. When the local dealership received our vehicle, we invited the media to the event. It was covered by two television stations and the local newspaper station. *See Attachment 9.*

One key event for the MSU team this year was their Ride and Drive event. We prepared for the event by working with university relations to send out media alerts and to invite Congressman Roger Wicker. The event was open to the community. We had a good attendance and received much media interest. The event was covered by two television stations and one newspaper station. A press release sent out by university relations after the event was also picked up by several papers. *See Attachments 2, 3 and 4.*

The following Monday, we drove the vehicle to Meridian to meet Congressman Chip Pickering. We showed Congressman Pickering the vehicle, and he drove it. We then interviewed with the local Meridian television station and newspaper station. After both events we sent thank you notes from the team to the congressmen. *See Attachment 5*.

This year we have continued circulation of monthly newsletters. This newsletter covers events that are going on with our team and spotlights a different student each month to tell how the student is gaining from being a part of the competition. Circulation is rising slowly, and each event that we go to we take a sign-up sheet to add names. The newsletter is also an important way to help us recognize our sponsors and keep them updated. The newsletter is also posted on our website and distributed to all engineering professors. *See Attachments 6, 7, and 8 for examples.*

K-12

One of the things our team is most proud of is our involvement with K-12 and mentoring of high school students. During the summer, a high-school student in a summering engineering program worked with us for 3 weeks. The student worked closely with the Challenge X team and learned about the project and engineering. *See figure 14.* During the spring semester, we mentored an 8th grade student, Justin Keasler, with his science fair project on regenerative breaking. We spent time with Justin helping him smooth out his project and brought him and his family to see our Equinox and its regenerative breaking system. Justin went on to win first place at the regional and state level. *See figure 16.* We have also still been closely involved with the high school solar car team from Houston, MS. *See figures 17 and 18.* The team has traveled to the MSU campus several times for mentoring meetings. They brought their vehicle for us to help them with, and they were able to see our vehicle.

This semester the outreach group held a “Name the Vehicle” contest open to K-8 students. We advertised the contest in our newsletter and when we attended events. We received close to 100 submissions and finally chose “Bio Bully” as our vehicle’s name. When we return from Mesa we will officially name the vehicle and hope to make it a media event.

Website

After having two website designers leave our team, we are still working on updating and improving our website. The site features MSU colors, with pictures of the vehicle, and cycling photographs of team members at different Challenge X activities. With a toolbar at the top, the site is easy to navigate.

Special features on the website include recent site updates for quick navigation to new content. A media room has been added to the site to include information to the press about our team and the Challenge X competition. Current and upcoming events are dated and displayed on the main page. We have also included cycling images on the website that display several of our outreach events and other activities.

Summary

Since the first year, outreach has changed for us. The local community and media are slightly more familiar with us. We are now sometimes contacted by someone who has seen us in the newspaper and wants us to do a presentation for the school, club, etc. We have been shown great support from the campus and community by attendance at events, sponsorship, and with letters of support. *See Attachment 19 for an example letter.*

Our efforts have taught us many skills, including organizing events, tailoring our presentations to the audience, and how to deal with the media. As working on the Equinox provides the engineering students with hands-on experience outside of their classes, these events and opportunities give us experience that we would never get from the classroom.

Community Outreach:

- **Presentation to Mississippi Development Authority**
  Key Participants – Marshall Molen, Faculty Advisor.
  Date – July 22, 2005
  Location – Jackson, MS
  Audience – Mississippi Development Authority members
  Description – Dr. Molen presented an overview of Challenge X in an effort to procure sponsorship.

- **Challenge X Overview to West Point, MS Rotary Club**
  Key Participants – Justin Crapps, Team Member.
  Date – August 4, 2005, 1 p.m.
  Location – West Point, MS
  Audience – West Point Rotary Club, approximately 40 people.
  Description – General overview of Challenge X and MSU's progress in the competition.

- **Challenge X Overview to American Welding Society of Northeast Mississippi**
  Key Participants – David Oglesby, Team Leader.
  Date – September 15, 2005
  Location – CAVS, MSU
  Audience – American Welding Society of Northeast Mississippi, approximately 10
  Description – General overview of Challenge X and MSU's progress in the competition.

- **Presentation to Miltech, Inc.**
  Key Participants – Bob Kirkland, Staff Advisor.
  Time and Date – September 19, 2005.
  Location – CAVS, MSU
  Audience – Key Miltech employees, approximately 3 people.
  Description – General overview of Challenge X and MSU's progress in the competition.

- **MSU Engineering Day**
  Key Participants – Amanda McAlpin, Outreach Coordinator; Terri Christian, Radar; Bill Bain, General Business Manager; Brian Christian, Team Member; Christopher Whitt, Team Member
  Date – September 24, 2005
  Location – MSU Campus, Starkville, MS
  Audience – Held on a home football game day, Engineering Day invited alumni as well as high school students and their parents to come and visit engineering departments before the game. The Challenge X group set up a booth with brochures and display board, and put the Equinox in front of all the activities.
  Description – General overview of Challenge X and MSU's progress in the competition.
  See figure 1 and 2.

Figure 1. Bill Bain talks with high school students at Engineering Day.

Figure 2. The Equinox displayed in front of Engineering Day tents.

- **Press Release on MSU College of Engineering Website**
  Date – Month of October, 2005
  Location – http://www.engr.msstate.edu
  Audience – Website visitors
  Description – Press release was written by the outreach coordinator about MSU Challenge X attending the fall workshop. Press release was displayed on the MSU College of Engineering Website.
  See Attachment 1.

- **MSU Discovery Day**
  Key Participants – Amanda McAlpin, Outreach Coordinator; Bill Bain, Team Member; Terri Christian, Team Member; Brian Christian, Team Member
  Date – October 22, 2005
  Location – MSU Campus, Starkville, MS
  Audience – Held on a home football game day, Discovery Day invited alumni as well as high school students and their parents to come and visit engineering departments before the game. The Challenge X group set up a booth with brochures and display board, and put the Equinox in front of all the activities.
  Description – General overview of Challenge X and MSU's progress in the competition.
  See Figure 3 and 4.

Figure 3. Part of the team in front of the Equinox at Discovery Day.

Figure 4. The Equinox has a small visitor at Discovery Day.

- **<u>Presentation to East Mississippi Community College students</u>**
  Key Participants – Bill Bain, Team Member; Bob Kirkland, Staff Advisor; Amanda McAlpin, Outreach Coordinator; Terri Christian, Team Member; Ron Lewis, Team Member
  Date – October 28, 2005
  Location – Center for Advanced Vehicular Systems, MSU
  Audience – About 18 students and 2 instructors
  Description – General overview of Challenge X and MSU's progress in the competition. Tour of facilities to show the vehicle and equipment used in the competition.
  See figure 5.

Figure 5. Community college students listen to Ron Lewis talk about the Equinox.

- **Presentation to Starkville Civic Club**
  Key Participants – Bill Bain, Team Member; Bob Kirkland, Staff Advisor
  Date – November 21, 2005
  Location – Restaurant meeting room, Starkville, MS
  Audience – Starkville Civic Club, about 13 members.
  Description – General overview of Challenge X and MSU's progress in the competition.

- **Presentation to MSU Engineering Class**
  Key Participants – Ron Lewis, Team Member; Kyle Crawford, Team Member; Christopher Whitt, Team Member
  Date – November 29, 2005
  Location – Center for Advanced Vehicular Systems, MSU
  Audience – MSU Engineering class. Approximately 15 students.
  Description – General overview of Challenge X and MSU's progress in the competition.

- **Presentation to Plymouth Tube Company, Inc.**
  Key Participants – Christopher Whitt, Team Member
  Date – January 27, 2006
  Location- Eupora, MS

Audience- Plymouth Tube employees, approximately 10.
Description - General overview of Challenge X and MSU's progress in the competition, recruitment of members.

- **Presentation to Jones County Junior College**
  Key Participants – Ron Lewis, Team Member; Amanda McAlpin, Outreach Coordinator; David Oglesby, Team Leader
  Date – February 28, 2006
  Location – Center for Advanced Vehicular Systems, MSU
  Audience – Students and faculty of Jones County Junior College, approximately 35.
  Description - General overview of Challenge X and MSU's progress in the competition, recruitment of members. Tour of vehicle.

- **Exhibition and Presentation at CAVS Showcase**
  Key Participants – David Oglesby, Team Leader; Bill Bain, General Business Manager; Christopher Whitt; Team Member; Amanda McAlpin, Outreach Coordinator; Jimmy Mathews, Team Member
  Date – March 9, 2006
  Location – Center for Advanced Vehicular Systems, MSU
  Audience – Local and regional business and industry. Approximately 250 people.
  Description – At the showcase, David and Bill gave a presentation to the audience; a general overview of Challenge X. The vehicle was also on display in the building, with brochures and posters about the competition. Students stood with the car for the day to answer any questions from visitors.
  See figures 6 and 7.

Figure 6. Posters and brochures by Equinox.

Figure 7. Bill Bain speaking about Challenge X.

- **<u>Summary of Challenge X in CATIA Operator's Exchange Conference Presentation</u>**
  Key Participants – Neil Littell, Team Member; Brandon Witbeck, Team Member
  Date – March 21, 2006
  Location – Atlanta, GA
  Audience – Attendees of the COE conference. This conference for users of computer-aided design software had an attendance of approximately 1300. Attending the specific presentation were about 95.
  Description – Neil and Brandon gave presentations on the use of CATIA software at Mississippi State University. They used the Challenge X project as specific examples of how they used the software. This included explaining the competition and showing examples of the work they did on the project.
  See figure 8.

Figure 8. COE Conference

- **Presentation to MSU College of Engineering Dean's Council**
  Key Participants – David Oglesby, Team Leader
  Time and Date – March 23, 2006
  Location – MSU Campus, Starkville, MS
  Audience – Approximately 25 members of the Dean's council. Alumni of the college who are voted onto the council to assist with decisions and fund-raising.
  Description – General overview of Challenge X and MSU's progress in the competition.

- **Presentation to MSU Computer-Aided Design Class**
  Key Participants – Bill Bain, General Business Manager; Neil Littell, Team Member
  Date – March 27, 2006
  Location – Center for Advanced Vehicular Systems, MSU
  Audience – MSU Computer-Aided Design class. Approximately 25 students.
  Description – General overview of Challenge X and MSU's progress in the competition, recruitment of members.

- **Presentation to AIAA Aeroespace Assocition**
  Key Participants – Neil Littell, Team Member
  Date – April 4, 2006
  Location- Center for Advanced Vehicular Systems, MSU
  Audience- Plymouth Tube employees, approximately 150.
  Description - General overview of Challenge X and MSU's progress in the competition.

- **Exhibited at Columbus Air Force Base Air Show**

Key Participants – Amanda McAlpin, Outreach Coordinator; Christopher Whitt, Team Member; David Oglesby, Team Leader; Ron Lewis, Team Member; Kyle Crawford, Team Member; Bob Kirkland, Staff Advisor
Date – April 9, 2006
Location – Columbus Air Force Base, Columbus, MS
Audience – Attendees to the air show, estimated at 60,000
Description – The vehicle was exhibited at the base with the other planes and a few vehicles. The team was on hand to answer questions and talk with passersby.
See figures 9 and 10.

Figure 9. Equinox being exhibited at Columbus Air Force Base show.

Figure 10. Visitors closely examining the Equinox at the air show.

- **Presentation to Starkville Civitan Club**
  Key Participants – Amanda McAlpin, Outreach Coordinator; Christopher Whitt, Team Member; Kennabec Walp, Team Member; Jimmy Mathews, Team Member; Josh VanLandingham, Team Member
  Date – April 24, 2006
  Location – Center for Advanced Vehicular Systems, MSU
  Audience – Members of the Starkville Civitan Club, approximately 20.
  Description – Overview and update of MSU Challenge X team. Presentations were done on subgroups of the Challenge X team. Tour of vehicle.

- **Ride and Drive Event**
  Key Partcipants - Entire MSU Challenge X team.
  Date – May 13, 2006
  Location – Center for Advanced Vehicular Systems, MSU
  Audience – Surrounding community.
  Description – The Ride and Drive event for MSU attracted people from the surrounding community and local sponsors. Working with university relations, we sent out press releases to local media, and the event was covered by two television stations and one newspaper. MS Congressman Roger Wicker also attended our event, drove the vehicle, and spoke to the media. We sent Congressman Wicker a letter of thanks after the event.
  See Figures 11 and 12. See Attachment 2, 3, and 4.

Figure 11. Congressman Roger Wicker driving the Equinox at our Ride and Drive event.


Figure 12. Cameramen from television and newspaper getting a good shot of the Equinox.

- **Meeting with Chip Pickering**
  Key Participants – Amanda McAlpin, Outreach Coordinator; Christopher Whitt, Team Member; Jimmy Mathews, Team Member; Ron Lewis, Team Member; Kyle Crawford, Team Member.
  Date – May 15, 2006
  Location – MSU Meridian Campus, Meridian, MS
  Audience – Congressman Chip Pickering and media.
  Description – We drove to Meridian to show Congressman Chip Pickering our vehicle. Congressman Pickering drove the vehicle and the event was covered by newspaper and the local television station.
  See Attachment 5 for newspaper article.

- **MSU Challenge X Newsletter**
  Date – Published semi-monthly
  Location – Sent to email list, hard copies sent to professors of all MSU engineering schools, and posted to the MSU Challenge X Website.
  Audience – Website visitors, community, and engineering professors.
  Description – The Challenge X newsletter contains updates on what the team has been working on, carries announcements and calendars, and spotlights students.
  See Attachment 6, 7, and 8 for examples.

Media Outreach:

- **Vehicle Donation Ceremony**
  Key Participants – Marshall Molen, Faculty Advisor; Bob Kirland, Staff Advisor; 8 members of the Challenge X team, Millsaps Chevrolet Dealership
  Time and Date – July 12, 2005 2 p.m.
  Location – Millsaps Chevrolet in Starkville, MS
  Description – Media were invited to attend the ceremony when the dealership owner gave the Equinox to the Challenge X team. The story was covered by 2 television stations, one newspaper, and campus university relations.
  See Attachment 9.

- **Picture with article on MSU Website**
  Time and Date – Late July, 2005
  Location – http://www.msstate.edu
  Description – Picture of MSU team at vehicle donation ceremony and accompanying story appeared on the MSU website homepage.
  See Attachment 10.

- **Article in The Republic, Columbus, IN Newspaper**
  Time and Date – August 2, 2005
  Description – Article written for The Republic, featuring interviews with MSU Challenge X team members.
  See Attachment 11.

- **Press Release on Roboticsonline.com**
  Key Participants – Neil Littell, team member.
  Time and Date – September 5, 2005, still posted.
  Location – Millsaps Chevrolet in Starkville, MS
  Description – Neil wrote a press release for the DELMIA Company detailing the MSU team's use of DELMIA software.
  See Attachment 12.

- **Article in Starkville Daily News**
  Date – October 10, 2005
  Description – The outreach team invited the Starkville Daily News to cover Challenge X. A reporter visited us and interviewed Bob Kirkland, staff advisor, and Amanda McAlpin, outreach coordinator. The article appeared on almost a full page in the Lifestyle section of the Sunday edition of the newspaper with two pictures of the team and the vehicle.
  See Attachment 13.

- **General Motors Check Donation**
  Key Participants – Bill Beggs, GM Team Mentor; David Oglesby, Team Leader; Amanda McAlpin, Outreach Coordinator; Bob Kirkland, Team Staff Advisor; Marshall Molen, Faculty Advisor
  Date – March 5, 2006

Location – Center for Advanced Vehicular Systems, MSU
Description – In a press conference, General Motors representative and team mentor Bill Beggs donated a check to cover the team's travel to the competition in Mesa, AZ. The event was publicized by sending media alerts to the local newspapers and television stations, announcing on local and university calendars. The event was covered in the local newspaper.
See Figure 13, and Attachment 14.

Figure 13. General Motors check donation.

- **Article in The Norman Transcript**
  Date – May 17, 2006
  Description – Article covering MSU's Challenge X team.
  See Attachment 15.

- **Article in Starkville Daily News**
  Date – May 18, 2006
  Description – Article covering MSU's Challenge X team.
  See Attachment 16.

- **Article in The Clarion Ledger**
  Date – May 24, 2006
  Description – Article with picture appeared in The Clarion Ledger, summarizing MSU's team performance for the year. The online version of the article included sidebars with additional information on Challenge X.
  See Attachments 17 and 18.

K-12 Outreach:

- **Quest Summer Program Student**
  Key Participants – David Oglesby, Team Leader; Brian Christian, Team Member, Mason Ruhl, Quest student.
  Time and Date – July 2005
  Location – Starkville, MS
  Description – The Quest high school student program is a 3 week program over the summer designed to allow high school students interested in majoring in engineering to work in some kind of engineering environment. Our student worked with Brian Christian for 3 weeks on several different Challenge X projects.
  See Figure 14.

Figure 14. Two team members (front) with Quest Program high-school student.

- **Presentation to Mississippi School for Math and Science Students**
  Key Participants – Amanda McAlpin, Outreach Coordinator
  Time and Date – October 21, 2005
  Location – Starkville, MS
  Audience – Mississippi School for Math and Science high school students. Approximately 30 students
  Description – Challenge X overview and MSU's progress in the competition.

- **Exhibit at MSU Breakfast of Champions**
  Key Participants – Bill Bain, General Business Manager
  Date – February 18, 2006
  Location – MSU campus
  Audience – High school seniors who received high scores on the ACT college entrance exam.
  Description – Exhibited with display board and brochures. Talked to students about Challenge X.
  See Figure 15.

Figure 15. Bill Bain talking to a student at Breakfast of Champions.

- **Presentation to High School Seniors**
  Key Participants – Josh VanLandingham, Team Member
  Date – February 23, 2006
  Location – MSU campus
  Audience – High school seniors on campus for recruitment events. Approximately 150 students.
  Description - Challenge X overview and MSU's progress in the competition. Recruitment to join team next year.

- **Presentation to Armstrong Middle School**
  Key Participants – Amanda McAlpin, Outreach Coordinator; Bill Bain, General Business Manger; Ashley Preibe, K-12 Outreach Chair
  Date – March 24, 2006
  Location – Starkville, MS
  Audience – Armstrong Middle School gifted/advanced students. Approximately 75 students.
  Description – Challenge X overview and MSU's progress in the competition.

- **Presentation to Starkville Academy Physics Class**
  Key Participants – Bill Bain, General Business Manager; Amanda McAlpin, Outreach Coordinator; Ashley Priebe, Team Member
  Date – May 8, 2006
  Location – Starkville Academy High School
  Audience – High school seniors.

Description – Overview and update of MSU Challenge X team. Presentations were done on subgroups of the Challenge X team.

- **Mentoring of Junior-High Student for Science Fair Project**
  Key Participants – Justin Crapps, Team Member; David Oglesby, Team Leader
  Date – First half of spring semester
  Location – Starkville, MS
  Description – After seeing a Challenge X presentation we made at his science fair last year, Justin Keasler, an 8th grader, contacted us and asked if someone would mentor him on his own science fair project. He chose regenerative breaking as his topic and the Challenge X team members helped him develop the idea and polish his project. The day before the project, the student presented his project to the entire Challenge X team who asked him practice questions. Justin and his family visited our facility and got to see how we used regenerative breaking in our vehicle. Justin won first place with his science project at the regional and state levels.
  See Figure 16.

Figure 16. The team poses with Jordan Keasler and his science fair project.

- **Mentoring Houston Vocational Center Solar Car Team**
  Key Participants – Entire MSU Team
  Date – June 2005 – May 2006
  Description – The MSU team worked with the Solar Car team throughout the year. The teams traveled to work together, and to see each other's vehicles.
  See Figures 17 and 18.

Figure 17. Solar Car team and members of MSU Challenge X team.


Figure 18. Team and solar car faculty look at the solar car.

Website:

The Mississippi State University Challenge X website includes a summary of Challenge X and its technical goals and objectives. There is a link to a sponsor page with links to each of the sponsors, and links to the national Challenge X website. Newsletters are posted each month on the website, as well as a monthly update on the homepage, as well as a sidebar for news and events. The site features MSU colors, with pictures of the vehicle, and cycling photographs of team members at different Challenge X activities. With a toolbar at the top, the site is easy to navigate.
Special features on the website include a recent site updates for quick navigation to new content. A media room has been added to the site to include information to the press about our team and the Challenge X competition. Current and upcoming events are dated and displayed on the main page. We have also included cycling images on the website that display several of our outreach events and other activities.
See figure 1.

Figure 1. Screenshot of the MSU Challenge X website homepage.

Attachments

Attachment 1.

Newsroom

Challenge X team learns about vehicle design

A group of Mississippi State students traveled to the heart of American car manufacturing last week to learn about modern vehicle design processes.

The students are participating in the Challenge X competition, sponsored by General Motors and the Department of Energy. The three-year competition requires the students to take a 2005 Chevrolet Equinox and redesign it to get the best fuel economy possible while minimizing exhaust emissions. The vehicle must also maintain or exceed standard vehicle performance and driver comfort. MSU is one of seventeen universities chosen from across North America to participate.

The 3-day workshop in Detroit, Mich., held September 29 through October 1, focused on training sessions on competition events, GM vehicle communications, GM Diesel engines, and the proper use of equipment. The students will use this information as they implement their unique design for their hybrid vehicle.

밿his workshop really gave us motivation to work harder on getting our vehicle ready for competition,?said Kennabec Walp, a graduate student in computer engineering who attended the workshop. The students had opportunities to make personal contacts with GM engineers and recruiters from Challenge X sponsoring companies.

Walp뭘 teammates that also attended the workshop included mechanical engineering graduate students Christopher Whitt and David Oglesby, computer engineering graduate student Ron Lewis, electrical engineering graduate student Jimmy Mathews, and mechanical engineering undergraduate student Brian Christian. Marshall Molen, a distinguished professor of electrical and computer engineering and the team뭘 Center for Advanced Vehicular Systems (CAVS) faculty advisor, also made the trip.

Dr. Marshall Molen, faculty advisor to the team, expressed how important the trip was for the students.

밿he students had the opportunity to have one-on-one interactions with GM engineers which further enabled them to understand the design processes employed by automotive engineers. This unique interaction with practicing engineers and their vehicle design processes was an invaluable experience for engineering students.?br /> Challenge X is housed in the CAVS facilities. CAVS provides faculty sponsors, equipment, and work area for the program, as well as financial support. CAVS is a research center devoted to the studies of all aspects of vehicles. CAVS is a part of the Bagley College of Engineering at Mississippi State University.

For more information on the team, or to inquire about becoming a local sponsor, please contact Bob Kirkland, at 662-325-1454.

Attachment 2.

Mississippi State University

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MEDIA ADVISORY: Wicker, Foglesong to test-drive hybrid car

News Article Archive

University Relations
News Bureau (662) 325-3442
Contact: **Phil Hearn**
May 10, 2006

Congressman Roger Wicker, R-Miss., and Mississippi State President Robert H. "Doc" Foglesong are expected to be on hand at approximately 11:30 a.m. Saturday [May 13] to test-drive a hybrid car developed by a team of engineering majors.

It's all a part of "Ride-and-Drive" activities scheduled 10 a.m.-2 p.m. in the parking lot of the university's Center for Advanced Vehicular Systems. Visitors attending the public event also will be invited to test-drive the novel vehicle.

The center is located in the Thad Cochran Research, Technology and Economic Development Park, situated just across Highway 182 immediately north of the Starkville campus.

Members of Mississippi State's Challenge X team will welcome visitors and answer questions about their ongoing redesign of a 2005 Chevrolet Equinox Sport Utility Vehicle. They are working to have the diesel-electric hybrid vehicle achieve as much as 38 miles-per-gallon when completed.

Tours of the state-of-the-art CAVS facility also will be conducted during the day. The research center is directed by Rand German.

About 10 members of the MSU team will leave May 30 for Mesa, Ariz. They are participants in the second year of the three-year National Challenge X competition sponsored by General Motors as part of an effort to generate new ideas on the future design of automobiles and other vehicles.

The MSU team is among 17 college and university groups from the U.S. and Canada competing. CAVS research scientist Marshall Molen, a noted authority in the field of power electronics, is team adviser.

(Rep. Wicker will be on campus Saturday to serve as featured speaker for the 9:30 a.m. commencement program in Humphrey Coliseum. Sen. Trent Lott, R-Miss., will address the second graduation ceremony, which begins at 2:30 p.m.)

For more information about the Saturday event or the Challenge X competition, contact Amanda McAlpin at (662) 325-5562 or **amcalpin@cavs.msstate.edu**.

Attachment 3.

Vehicle of the future?

Gas prices bring new attention to MSU's research

By Earl Descant
Dispatch Starkville Bureau
edescant@cdispatch.com

STARKVILLE — It may have only been a short ride "up the hill" and back to the student garage, but it was enough to confirm what U.S. Rep. Roger Wicker already knew.

"This is the kind of research that we're talking about in Washington today, and I think this is the sort of research that we should be doing at Mississippi State," said Wicker after a test-drive Saturday of a reconfigured bio-diesel hybrid Chevrolet Equinox designed by a group of Mississippi State University students at the Center for Advanced Vehicular Systems.

The vehicle and its team of about 15 students will compete in the Challenge X national competition in Mesa, Ariz., May 30 to June 8 against 17 other North American teams. The competition is set up much like the endurance testing General Motors performs on its new vehicles, covering areas such as towing, fuel economy and overall hardiness.

Team members come from across various disciplines – some not engineering related – and from the ranks of both graduate and undergrads.

"Everyone works on something different. We have an electrical group, a power group, and even a community out-reach group," said Challenge X Team-Leader David Oglesby, a mechanical engineering graduate student from Columbus.

"I did a lot of the welding that needed to be done on the car," said mechanical engineering senior Brian Christian, who formerly worked as a machinist before deciding to re-enter college. Since the SUV's rear wheels are powered by an electric motor, and the front wheels are powered by a small bio-diesel engine, parts of the car's frame had to be modified.

And what professors and students at CAVS along with other energy research regions of the campus confirm is the perfect timeliness and validity behind developing new technology to make cars more energy efficient.

"This is the most timely research that we could be doing at our university," said Dr. G. Marshall Molen, the student advisor to the Challenge X team.

"There so much more we could be doing and I think now we are," added Molen, noting the work the students are doing has tremendous community and national support, as he pointed to dozens of decals covering the SUV ranging from large companies such as Chevron Oil, XM Satellite Radio, the Renewable Fuels Association, as well as local groups like Peay's Auto Salvage, Plymouth Tubing Company and 4-County Electric.

A project like the Challenge X team has other greater gains beyond promoting alternative ways of thinking about how tomorrow's cars will operate. The team serves as a valuable classroom, where students gain hands-on experience. Already, new mechanical engineering graduate Josh Van Landingham has a job with Toyota in Erlanger Ky.

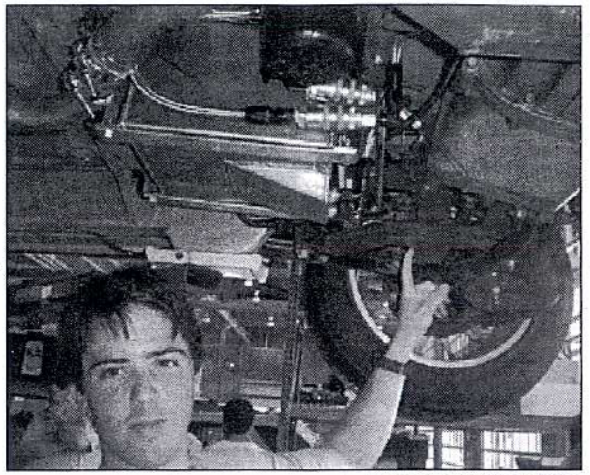
"You just can't beat that sort of thing (hands-on experience). It's not the sort of thing you get in a complete classroom situation," said Landingham.

Even if the engineering students' Equinox, with its nearly 35 miles per gallon and its nickel-metal-hydride battery which weighs 200 pounds but would weigh 1,400 pounds if if it were a traditional lead-acid car battery, seems cutting edge today, it may be a has-been in a few years, as the university continues to keep the fast-track on energy development.

A neighbor to CAVS at the Thad Cochran Research Park is the Institute for Clean Energy Technology, formerly called Diagnostic Instrumentation and Analysis Laboratory. One of the latest companies to set up shop at ICET is Advanced Battery Systems, a company based in Great Britain, which is doing extensive research in lithium-ion batteries, which are the high-energy and relatively light-weight rechargeable batteries already used in many cellphones and laptop computers.

ABSL represents some of the newest ground-breaking work at the 30-year-old MSU research center.

"Historically, there has been tremendous investment in issues that are linked to environmental sustainability, such as energy-efficient (industrial) processes or alternative energy," said Dr. Charles Waggoner, the deputy director of ICET, noting much of the energy research being explored at ICET deals with batteries, fuel cell technology and gasification.



Earl Descant/Dispatch Starkville Bureau

MSU Challenge X team member and mechanical engineering senior Brian Christian points to modifications made to the 2005 Chevrolet Equinox SUV in order to accommodate its electric motor.

"The energy costs that we're facing right now certainly should give folks pause to consider what could happen if one or more of our off-shore energy sources were lost," said Waggoner.

Wicker, like many lawmakers and others, would like to see the United States wean itself from such a high dependency in foreign crude and natural gas.

And though Wicker says he supports controversial measures like drilling above the Arctic Circle and expanding Gulf of Mexico offshore drilling, he applauds the work being done at MSU and says he will push for more congressional support of energy-related research for the state.

"It's what we should be doing as a nation, and I'll be anxious to talk to my colleagues about this when I get back to Washington on Tuesday," said Wicker, R-1st District.

Attachment 4

Center for Advanced Vehicular Systems CAVS

May 26, 2006

Congressman Roger Wicker
2455 Rayburn House Building
Washington, DC 20515

Dear Congressman Wicker,

We would like to thank you for visiting the MSU Merdian campus and participating in our Challenge X Hybrid Vehicle "Ride and Drive Event" on Saturday, May 13. Your interest and enthusiasm in our program was greatly appreciated. We will keep you updated as to our team's progress.

Sincerely,

Amanda McAlpin
Outreach Coordinator for MSU Challenge X Team
Mississippi State University

CENTER FOR ADVANCED VEHICULAR SYSTEMS
200 RESEARCH BLVD.
STARKVILLE, MS 39759

Mississippi State UNIVERSITY

Attachment 5.

Barbour and the Kenndard case

page A4

forces game 3 in Class 3A championship series

page C1

THE MERIDIAN STAR

www.meridianstar.com

Tuesday, May 16, 2006 Since 1898 50 cents

Bush will send troops to border

WASHINGTON (AP) — President Bush, trying to build support for a major overhaul of the nation's tattered immigration laws, said Monday night he would order as many as 6,000 National Guard troops to secure the U.S. border with Mexico and urged Congress to give millions of illegal immigrants a chance at citizenship.

"We do not yet have full control of the border and I am determined to change that," the president said in a 17-minute prime-time address from the Oval Office.

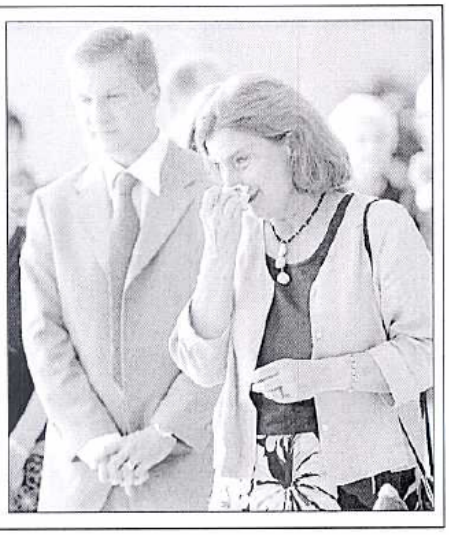
Bush gave strong support to a plan that would give many of the 12 million illegal immigrants in the United States an eventual path to possible citizenship — a move derided by some conservatives in his own Republican Party as amnesty. He rejected that term.

"It is neither wise nor realistic to round up millions of people, many with deep roots in the United States and send them across the border," he said. "There is a rational middle ground between granting an automatic path to citizenship for every illegal immigrant and a program of mass deportation."

The Guard troops would mostly serve two-week stints before rotating out of the assignment, so keeping the force level at 6,000 over the course of a year could require up to 156,000 troops.

Still, Bush insisted, "The United States is not going to militarize the southern border."

See Bush Page A3



SAYING GOODBYE

Judy Crowson, friend of G.V. "Sonny" Montgomery, wipes away a tear as her son, Thomas, stands by during visitation for Montgomery at the main hangar of Key Field, home of the Mississippi Air National Guard's 186th Air Refueling Wing.

PHOTO BY KYLE CARTER THE MERIDIAN STAR

HOUSE FIRE

PHOTO BY KYLE CARTER / THE MERIDIAN STAR

Neighbors watch Monday afternoon as emergency responders from the Meridian Fire Department work to extinguish a house fire at 2701 11th St. in downtown Meridian. The blaze was reported at 1:27 p.m. It apparently was caused by a child playing with matches, MFD officials said, though the incident remains under investigation. Battalion Chief Howard Gibson said the house was engulfed in flames when firefighters arrived. The two-story, wood-frame house was destroyed, Gibson said, but all occupants had been evacuated. A firefighter pulled a muscle in his back; he was treated at a local hospital and released.

Supervisors argue over plans for Sears building

By Steve Gillespie
assistant editor

Two Lauderdale County supervisors on Monday encouraged the public to contact their supervisors to find out what's going on.

But District 5 Supervisor Ray Boswell and board President Craig Hitt, who represents District 3, have conflicting views of how drawings came about for possibly putting some county offices and the juvenile detention center in the old Sears building on 22nd Avenue.

Boswell first objected to the drawings, presented to the board by Engineering Plus of Meridian, during a work session Thursday. He said the board had not authorized having plans drawn up. He continued his objections Monday at the end of the supervisors' board meeting.

"It's going to be very expensive to the taxpayers of this county if the drawings are accepted," Boswell said.

He questioned the legality of having drawings done without formal board approval and said that all county offices should be located together.

"I don't think you want county government to be spread out all over town. Talk to your supervisors and find out what their plans are, and let them know if you support it or not," Boswell said.

Hitt said: "If you have questions and concerns, please do call your supervisors." He also said board members had tried to explain the situation to Boswell.

After Monday's meeting, Hitt said the board has a standing agreement with Engineering Plus to do work for the county. He did not know what the drawings would cost.

"It will come up on the next claims docket," Hitt said of the firm's bill for the drawings.

He said the board discussed having the plans drawn up at one of two work sessions prior to Thursday's meeting and that Boswell was present for the discussion.

Hitt also said the plans are extremely preliminary and that the drawings are not actual architectural drawings but basic plans to give a developer an idea of what the county may be considering.

The board has been seeking solutions to various space problems in county government for several years.

See Supervisors Page A2

CROSS-BURNING

George Clark Roberts, president of the Kemper County branch of the National Association for the Advancement of Colored People, looks at a charred cross outside the Kemper County Sheriff's Department on Monday. The cross, made of 2-inch-by-6-inch boards and ignited with diesel-soaked towels, was reportedly left in the yard of George Hatch on Friday night. Roberts said the Federal Bureau of Investigation has been called about the incident.

PHOTO BY KYLE CARTER THE MERIDIAN STAR

MSU students build a better 'hybrid'

By Cathy Hayes
staff writer

Ten students from Mississippi State University have stopped complaining about gas prices; instead, they're competing in a nationwide contest to redesign the cars we drive.

The students showcased their "hybrid" car at MSU-Meridian Campus for U.S. Rep. Chip Pickering, R-Miss., on Monday. Pickering is vice chairman of the U.S. House of Representatives Energy and Commerce Committee.

General Motors Corp. and the U.S. Department of Energy have chosen 17 engineering schools in the United States and Canada to build a hybrid car, one powered by both both fossil fuels and electricity. The idea is to improve mileage and reduce emissions.

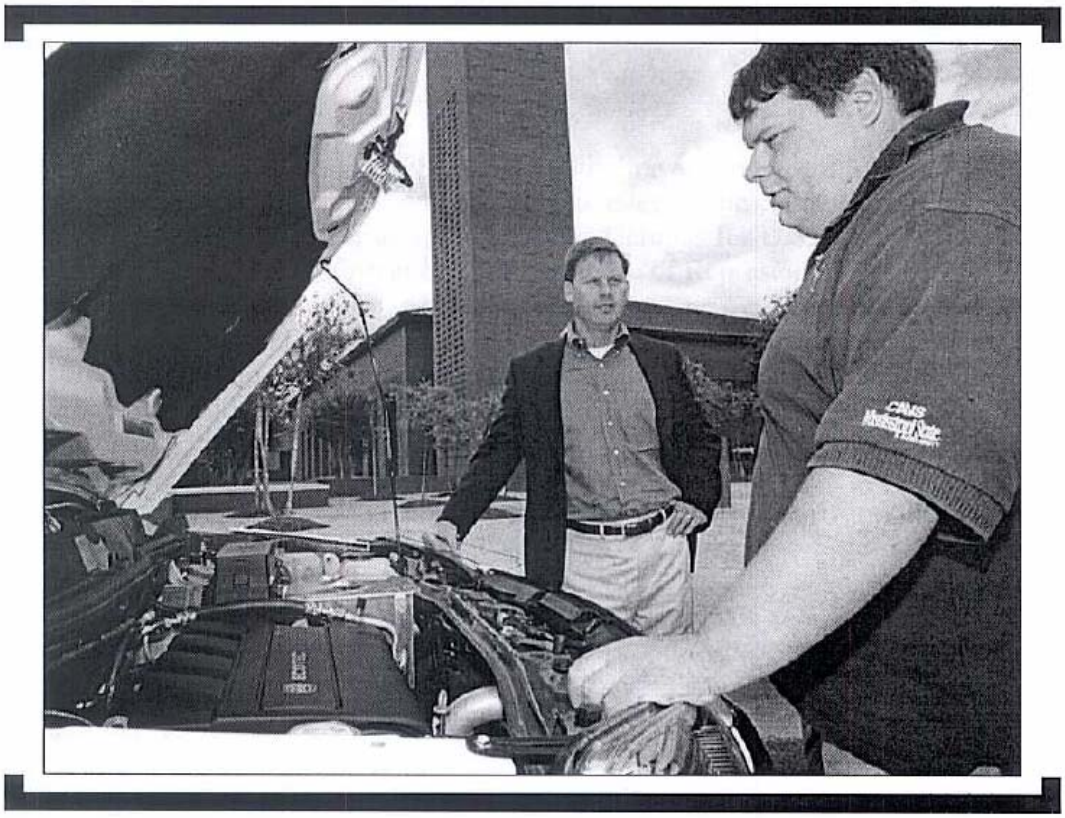
See Hybrid Page A2

Eagles drop Region 23 opener C1

Katrina home grant application process ends this month A5

Today
High: 75
Tonight
Low: 52
Complete forecast A2

Complete index A2



U.S. Rep. Chip Pickering, R-Miss., left, speaks Monday with Christopher Whitt, Power Train Thrust Leader for Team Challenge X at Mississippi State University-Meridian Campus. Whitt explained to Pickering how the team rebuilt a 2005 Chevrolet Equinox to run as a diesel hybrid — attempting to increase fuel economy and decrease fuel emissions. The team, compromised of MSU students, is one of 17 in the United States competing to design and build the most efficient vehicle, using the 2005 Chevrolet Equinox.
None / By Kyle Carter

• Year No. 3: At the final competition beginning May 30, GM technicians will inspect the cars to approve the safety features and make sure they meet all contest guidelines. Cars will then have to pass a braking, towing and speed test.
The cars should run the same as a normal gasoline-powered model — but without the high exhaust and gas bill.
"We would like to be in the top half of each event, but they are all different. Every team has their own strategy to win," said Kennabec Walp, a computer engineering major and controls strategy group leader. Other competing schools include Waterloo University in Canada, Georgia Tech University, University of Wisconsin, Tennessee State University and West Virginia State University. This is the first time MSU has competed in a contest like this one.
"There is a lot of time that goes into completing the competition. By hosting it, General Motors really gets the cream of the crop from the top engineering schools across the country," McAlpin said. "Many of our recent graduates who have worked on the car have received jobs with GM."
Pickering agreed: "Their brainpower will give us fire- and horsepower for the future."

CHALLENGE X TEAM

The students representing Mississippi State University in the Challenge X contest are Christopher Whitt of Lauderdale; Kennabec Walp of Tylertown; Kyle Crawford of Columbus; Jimmy Mathews of Bombay, India; Amanda McAlpin of Mathiston; Josh Van Landingham of Jackson; Ron Lewis of Heidelberg; David Oglesby of Columbus; Brian Christian of Slidell, La.; and Stephen Phillips of French Camp.

Photos

U.S. Rep. Chip Pickering, R-Miss., left, speaks Monday with Christopher Whitt, Power Train Thrust Leader for Team Challenge X at Mississippi State University-Meridian Campus. Whitt explained to Pickering how the team rebuilt a 2005 Chevrolet Equinox to run as a diesel hybrid — attempting to increase fuel economy and decrease fuel emissions. The team, compromised of MSU students, is one of 17 in the United States competing to design and build the most efficient vehicle, using the 2005 Chevrolet Equinox. By Kyle Carter

Attachment 6.

Volume 2, Issue 2 October 15, 2005

MSU are you up to the challenge? CHALLENGE X CROSSOVER TO SUSTAINABLE MOBILITY

Mississippi State University

X-cited!

Team Members Attend Fall Workshop

Special points of interest:

- *Team members get valuable information at a workshop in Detroit, see adjacent article.*
- *See what each thrust is working on in our regular Thrust Update Area.*
- *Jimmy Mathews is featured as this edition's Student in the Spotlight.*
- *Elementary school students! Give us your ideas for a name for our Equinox! See page 2.*

Six members of the MSU Challenge X team traveled to the heart of American car manufacturing last month to learn about modern vehicle design processes.

The 3-day workshop in Detroit, MI., held September 29 through October 1, focused on training sessions on competition events, GM vehicle communications, GM Diesel engines, and the proper use of equipment. The students will use this information as they implement their unique design for their hybrid vehicle.

"This workshop really gave us motivation to work harder on getting our vehicle ready for competition," said Kennabec Walp, a graduate student in computer engineering. The students had opportunities to make personal contacts with GM engineers and recruiters from Challenge X sponsoring companies.

The team poses with an antique Cadillac as they tour the GM Heritage Center in Detroit.

Walp's teammates that also attended the workshop included mechanical engineering graduate students Christopher Whitt and David Oglesby, computer engineering graduate student Ron Lewis, electrical engineering graduate student Jimmy Mathews, and mechanical engi-

Thrust Update Area: What are they working on?

Vehicle Modeling and Controls

After having run quite a few simulations in PSAT for analyzing both the default and newly-devised control strategies, we are now putting together the actual production control strategy. We have begun from scratch by documenting all possible modes of operation of our hybrid and are presently conjuring the logic diagram for mode-transitions and optimal torque distribution. We are also deliberating about some critical features that our strategy should possess.

Thrust Leaders: Jimmy Mathews and Kennabec Walp

Mechanical

The mechanical group has been working on light-weighting issues, building a battery box for our trailer, and just removed the "spare" Equinox's engine.

Thrust Leader: Brian Christian

Electrical

We have been working on getting the Ballard drive wiring harness finished.

Helping the controls group with the control strategy.

Working on implementing the lead acid battery pack for testing purposes.

Thrust Leader: Ron Lewis

Powertrain

We have been continuing our work on the rear cradle redesign, the Ballard cooling system, and updating the fuel system schematic. Began collecting the CAD files necessary to position the GM Diesel engine and the transmission.

Thrust Leader: Christopher Whitt

Outreach Program

Our team was featured in the October 9th Starkville Daily News with an article and pictures of team members.

We'll be at Discovery Day on the Drill Field with the Equinox on October 22. Stop by!

Thrust Leader: Amanda McAlpin

neering undergraduate student Brian Christian. Marshall Molen, faculty advisor for the team, also made the trip.

Molen expressed how important the trip was for the students.

"The students had the opportunity to have one-on-one interactions with GM engineers which further enabled them to understand the design processes employed by automotive engineers. This unique interaction with practicing engineers and their vehicle design processes was an invaluable experience for engineering students."

The team will now have to put the training to use as they begin working on removing the drive train from the Equinox and replacing it with their own design.

Atta-Dawgs

- Good job **Stephen, Brian, and Ron** on the nice progress made on our battery test trailer.

Upcoming Events

October 20—Outreach Report #1 Due

October 22—Discovery Day—We'll be on the MSU Drill Field with our Equinox from 9 a.m. to noon. Come by and see our booth!

November 4—First team progress report for Year 2 due.

"Name our Vehicle" Contest

Open to grades K-8

Submit your idea for a great name for our vehicle! If your idea is chosen by the Challenge X team, we'll put it on our Equinox and you'll get a prize!

Deadline January 15

Please submit name ideas with your name and contact information to:

Challenge X
200 Research Blvd

Students in the Spotlight

This column gives you a behind-the-scenes look at the students who are working on the Challenge X competition at MSU.

This week's student in the spotlight section features Jimmy Mathews, a leader of the modeling and controls group. Jimmy joined the Challenge X team in May and quickly became one of our key members thanks to his talent, skill, and get-the-job-done attitude. Jimmy is an excellent student, and it carries over to the quality work he does on Challenge X. That is why we chose him for this edition's spotlight.

Name: Jimmy Mathews
Hometown: Mumbai, India
Major: Electrical Engineering

Jimmy Mathews was relatively new to the team in June as they traveled by van to the Year 1 competition in Detroit. But as the team got to know him, they found him to not only be very personable, but also intelligent and talented.

Jimmy now helps lead the controls and modeling group, and he's very enthusiastic about Challenge X.

Jimmy poses with an engine.

"I am simply awed by the sheer abundance and diversity of talent that the MSU Challenge X team possesses. I feel lucky to be a part of something so creative and mind-stirring," said Jimmy.

Jimmy said that he gets a lot out of being a part of Challenge X.

" Challenge X has given me the privilege of walking up to some key figures involved in changing the face of the global automotive industry and hear their thoughts. That includes distinguished people from top officials in General Motors and Argonne National Laboratory, to our very own Dr. Molen. Also, having had many opportunities to interact with students from universities across the US involved in Challenge X, I value the sense of camaraderie and commonness of the trials and tribulations that we share."

Of course, as the name implies, Jimmy knows there are challenges to be met with the competition, also. Jimmy said one of those challenges for him is ensuring that the vehicle eventually would be mass producible, not just a prototype.

As the team heads into the second year of competition, Jimmy is looking forward to several things.

"The mere thought of doing well at next year's competition gets my adrenaline pumping. All tiny bits and pieces of stuff that we put together will be subject to some real tight scrutiny. I am impatient to hear the engine rev-up and the motor spin. I am looking forward to seeing the grin on everyone's faces."

Not only does Jimmy add great talent and skill to the MSU team, he does it with a grin on his own face.

For newsletter suggestions or corrections, please contact Amanda McAlpin at amcalpin@cavs.msstate.edu.

Attachment 7.

Volume 2, Issue 3 November 8, 2005

MSU are you up to the challenge? CHALLENGE X CROSSOVER TO SUSTAINABLE MOBILITY

Mississippi State University

X-cited!

Year 2 Presents Challenges, Opportunities

Special points of interest:

- *What happens in year 2? Read the adjacent article.*
- *See what each thrust is working on in our regular Thrust Update Area.*
- *Kyle Crawford is featured as this edition's Student in the Spotlight.*
- *Elementary school students! Give us your ideas for a name for our Equinox! See page 2.*

As the MSU team submits their first progress report this week, they have plans in place for a busy year 2.

Reporting procedures have changed somewhat since the first year of the competition. Year 2 will have fewer technical reports because of the amount of time the team will have to spend working on the vehicle. This year's reports will be broken down into 2 technical reports and 3 progress reports to give an update on the team's progress of integrating their architecture into the Equinox.

As always, the team must work toward specific technical goals to keep in form with the competition. Year 2 technical goals include integrating the architectures and modeling development from year 1. The team also plans to emphasize pre-competition readiness in the areas of safety, performance, and technical reporting.

A group of EMCC students listen to Ron Lewis as they learn about Challenge X and tour the CAVS facility. The visit was a part of the outreach program for year 2.

The outreach program also remains strong for year 2 of the competition. This year will include all the outreach events from last year, and a few more. One new event this year is a "Name our Vehicle" contest for children in grades K-8. This contest will give even younger students a chance to learn about Challenge X.

Thrust Update Area: What are they working on?

Vehicle Modeling and Controls

The vehicle modeling and controls group spent last week putting together all component values and efficiency maps that are as close as possible to the actual values. This is in preparation to simulating their powertrain in PSAT with the final VTS, for the Fall Technical Report that is due soon.

They also ran a few analyses in PSAT to compare the 5-speed VW transmission and the 6 speed GM transmission.

Thrust Leaders: Jimmy Mathews and Kennabec Walp

Mechanical

The mechanical group pulled the engine out of the Equinox and are nearing completion of the cradle jig.

Thrust Leader: Brian Christian

Electrical

The electrical group is continuing to work with the controls group on developing the control strategy and testing the various functions.

We are also continuing to develop the various wiring harnesses for the Equinox.

Thrust Leader: Ron Lewis

Powertrain

We are working on completing the required documentation for the progress report. Christopher went to Virginia last week to meet with CCA Inc. to discuss a NOX reduction strategy.

Thrust Leader: Christopher Whitt

Outreach Program

Last week we had our first visit of the year from EMCC students. They visited Friday to learn about the Challenge X competition and took a tour of the CAVS facility. More visits are scheduled.

Outreach Coordinator: Amanda McAlpin

Fall is finally here!

Even in Mississippi, November brings cold weather. As you unpack your coats and sweaters, remember to think about how the **colder temperatures affect your vehicle**. David Oglesby, leader for the MSU Challenge X team, says to remember vehicle maintenance in the cold weather. And a car that runs better is a car that gets better gas mileage!

"As the weather gets colder, you should make sure to check the antifreeze in your vehicle," said Oglesby.

And, as always, check your oil and make sure your tires have plenty of air. Being stranded with car trouble is even worse when it's freezing outside!

Atta-Dawgs

- Good job **mechanical group** on removing the engine from the Equinox!
- **Brian and Stephen** got the VW engine running on the test stand!

Upcoming Events

November 4—First team progress report for Year 2 due.
November 8—Safety tech talk.
November 17—First technical report rough draft due.
December 1—Technical report #1 final draft due.

"Name our Vehicle" Contest

Open to grades K-8

Submit your idea for a great name for our vehicle! If your idea is chosen by the Challenge X team, we'll put it on our Equinox and you'll get a prize!

Deadline January 15

Please submit name ideas with your name and contact information to:
Challenge X
200 Research Blvd
Starkville, MS 39759

Students in the Spotlight

This column gives you a behind-the-scenes look at the students who are working on the Challenge X competition at MSU.

This week's student in the spotlight section features Kyle Crawford, a part of the powertrain group and our resident emissions expert. Kyle joined the Challenge X team in May and has since been invaluable in that area of the competition. Kyle has become a great asset to the dynamics of the MSU team, and is simply a pleasure to be around. That is why we chose him for this edition's spotlight.

Name: Kyle Crawford
Hometown: Columbus, MS
Major: Graduate student in Chemical Engineering

Here Kyle answers a few questions about his experience with Challenge X.

Q. What do you feel like you are gaining out of being part of Challenge X?
A. Challenge X has provided me an opportunity to be in a full-time job atmosphere despite being a graduate student. It is much like the real work force in that we work as a team and each member is responsible for accomplishing tasks in his or her area of expertise. Also in our competition many times the responsibilities of group members overlap so we have to help each other out in these situations. All of the people working on this project are committed to representing Mississippi State well on a national basis, and we are all more than willing to help another member in need.

Kyle runs an emissions test on the Equinox.

Q. What is the most difficult part of Challenge X for you?
A. The most difficult part of Challenge X for me has just been getting caught up. I am relatively new to this team and I had to learn fast about the challenges I was facing as a leader for the emissions area. I feel like we are close to being on pace for the Year 2 competition in emissions now. We still have a lot ahead of us, but things seem to be running smoother now.

Q. What do you plan to do after you get your degree?
A. I hope to get a job in a similar field to the emissions work I'm doing now. This is a very interesting area, one where much improvement can and will be made. With the great emphasis on environmental impacts today, improved car emissions could be very beneficial to areas such as global warming and general health issues related to large amounts of vehicular emissions. I believe this will be emphasized even more for many car manufacturers in the near future.

For newsletter suggestions or corrections, please contact Amanda McAlpin at amcalpin@cavs.msstate.edu.

Attachment 8.

Volume 2, Issue 4 January 20, 2005

MSU are you up to the challenge? CHALLENGE X CROSSOVER TO SUSTAINABLE MOBILITY

Mississippi State University

X-cited!

Wisconsin Team Visits MSU

Special points of interest:

- *Wisconsin Challenge X team comes to visit! Read the adjacent article.*
- *See what each thrust is working on in our regular Thrust Update Area.*
- *Terri Christian is featured as this edition's Student in the Spotlight.*
- *Elementary school students! Give us your ideas for a name for our Equinox! See page 2.*

A visit from the Wisconsin Challenge X team ended with a running diesel engine last week as the two teams collaborated for work and a little team bonding.

Four students and the faculty advisor from the Wisconsin team made the week long trip, which had several objectives, including an outreach event and touring an aluminum ladder production plant to see how the plant handled aluminum extrusions.

"The outreach event was very successful, and touring the plant gave us a chance to see metal being used in a real way instead of just the classroom," said Liz Casson, one of Wisconsin team members.

During the team's visit here, they worked with MSU team members to get the GM Diesel

The Wisconsin team and the MSU team pose together next to MSU's Equinox. The Wisconsin team spent Friday afternoon through Sunday working with the MSU team, and also had a little time to socialize.

Thrust Update Area: What are they working on?

Vehicle Modeling and Controls

Jimmy has been working on our control strategy.

Kennabec has been doing some testing with the motor and lead acid batteries and working on laying out all of the inputs and output for each component.

Thrust Leaders: Jimmy Mathews and Kennabec Walp

Mechanical

We have gotten the GM diesel running with the help of the Wisconsin team. We are also beginning rear cradle construction.

Thrust Leader: Brian Christian

Electrical

The electrical group has finished work on the lead acid battery pack, and a successful test of the Ballard electric drive was conducted using the lead acid batteries. Work is continuing on the wiring schematics, and developing the emergency stop circuit for the competition.

Thrust Leader: Ron Lewis

Powertrain

We have received the Ballard cooling heat exchanger. The cradle analysis is underway and results are expected soon. The rear suspension has been removed from the mule Equinox.

Thrust Leader: Christopher Whitt

Outreach Program

Our second Outreach Report was turned in in December. Now we're gearing up for the spring semester with several exciting outreach events.

Outreach Coordinator: Amanda McAlpin

engine running, one of the main goals for this semester. The information that the Wisconsin and MSU teams gained while working on the motor will be shared with the 9 other teams using a diesel engine in their vehicle.

"This was really important because it is information that was needed by all 9 teams using a diesel engine," said David Oglesby, the MSU team leader. "We really benefited from the Wisconsin team's experience, since they have entered competitions similar to Challenge X in the past."

While the Wisconsin team was here, they also got to have a little fun, and try a taste of southern cuisine. Friday night both teams dine on fried catfish.

Atta-Dawgs

- Good job team on bringing the GM Diesel engine to life!

Upcoming Events

January 24—Engineering the Automotive Future Workshop, University of Alabama

January 26—Progress Report 2 due.

January 26—Control Strategy Tech

"Name our Vehicle" Contest

Open to grades K-8

Submit your idea for a great name for our vehicle! If your idea is chosen by the Challenge X team, we'll put it on our Equinox and you'll get a prize!

Deadline March 15

Please submit name ideas with your name and contact information to:
Challenge X
200 Research Blvd
Starkville, MS 39759

Students in the Spotlight

This column gives you a behind-the-scenes look at the students who are working on the Challenge X competition at MSU.

This week's student in the spotlight section features Terri Christian, a part of the outreach group and the team Radar. Terri has been a part of the Challenge X team since early 2005. Terri's enthusiasm and positive attitude make a great contribution to the team, and that's why we chose her for this edition's spotlight.

Name: Terri Christian
Hometown: Mathiston, MS
Major: Undergraduate student in Machine tool operation

Here Terri answers a few questions about her experience with Challenge X.

Q. What do you feel like you are gaining out of being part of Challenge X?
A. People skills and organizational skills are definitely important. I'm also getting a lot of automotive and troubleshooting experience.

Terri during summer vacation, next to the Alaska pipeline

Q. What are the ups and downs of being the team Radar?
A. Communicating with radars from other teams is very cool. We all email back and forth between each other to find out what all the teams are doing. But taking care of last minute things is one of the more difficult parts.

Q. What do you most enjoy about being a part of the team?
A. Being a part of the whole process, being involved with the team and going to competition. And seeing where you're making a difference in the future.

Q. What is one of the most memorable experiences from Challenge X for you?
A. I really enjoyed going to competition last summer in Detroit.
I also really enjoyed the visit from the Wisconsin team. It was fun getting to know other members of other teams from Challenge X. We had a lot of time to talk and then we were able to get the diesel engine running. They were a big help with that.

Q. What do you plan to do after you get your degree?
A. I'd like to start my own machining business.

For newsletter suggestions or corrections, please contact Amanda McAlpin at amcalpin@cavs.msstate.edu.

Attachment 9.

AUTOMOTIVE MAKEOVER

MSU one of 17 universities selected for Challenge X

By EMILY JONES
Starkville Daily News

It looks perfectly good sitting shiny and new on the new car lot at Millsaps Chevrolet-Pontiac-Buick and GMC.

But the silver 2005 Chevrolet Equinox is about to be taken apart and subjected to a sort of auto make-over that could revolutionize the industry.

Described as a "crossover vehicle," the brand new automobile combines elements of both a sport utility vehicle and a passenger car.

The U.S. Department of Energy and General Motors are teaming up with other sponsors to challenge the best and brightest engineering students from 17 universities throughout North America in the contest they have nicknamed "Challenge X: Crossover to Sustainable Mobility."

The automobile was turned over to students and officials of the MSU Center for Advanced Vehicular Systems (CAVS) on Tuesday.

It was driven to the CAVS facility located in the Thad Cochran Research, Technology and Economic Development Park. There it will receive a major overhaul during the next three years.

"A team of some 50 engineering students will work with CAVS personnel to develop leading-edge automotive propulsion, fuels and emission-control technologies during the course of the program," said Bob Kirkland, business development officer for CAVS.

He noted American consumers have tended to purchase family-sized vehicles that offer more utility during the last decade. The trend has produced increased energy consumption and vehicle emissions.

Catherine Ragsdale/SDN

Above and left, staff members and students at Mississippi State's Center for Advanced Vehicular Systems pick up the new Chrevolet Equinox that they will use as part of Challenge X.

The long-term implications of stress on the environment and energy supplies prompted the partnership between the automotive industry, the U. S. Government and academia.

The auto makeover project is part of a three-year engineering competition that will challenge the selected universities to explore solutions to minimize energy use and reduce vehicle emissions.

The students will be challenged to do intensive testing to find alternative fuels, such as hydrogen, ethanol, and biodiesel, and to develop an innovative approach to minimize impact on the environment. The goal, Kirkland said, is a sustainable transportation future.

MSU is currently seeking additional sponsors for the program in order to include additional students.

The sponsors will contribute such key elements as fuel cells, propulsion systems, fuels, emissions technology and raw materials.

For more information contact Kirkland 325-1454 or log onto http://www.challengex.org for more information.

Attachment 10.

Mississippi State University

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CHALLENGE X TEAM — Members of Mississippi State's Challenge X team show off the new 2005 Chevrolet Equinox they received recently during an event climaxing the first year of the national competition. The team of students and faculty advisers, representing the Bagley College of Engineering and Center for Advanced Vehicular Systems, is among 17 collegiate squads nationally that are re-engineering the cross-over sport utility vehicle over a three-year period. In the foreground (l-r) are Kyle Crawford, faculty adviser Marshall Molen and Justin Crapps. In the background (l-r) are staff adviser Bob Kirkland, Ron Lewis, Christopher Whitt, CAVS staff member Amanda McAlpin, Kennabec Walp, Matthew Tucker, Terri Christian, Brian Christian and Jimmy Matthews.
(*Jul 13, 2005 Photo by Megan Bean*)

Attachment 11.

The Republic – Columbus, IN
Monday, August 08, 2005

Engineers turn confusion into confidence

By Chrissy Nethercutt
cnethercutt@therepublic.com

After a year of planning and designing, Ron Lewis was ready to turn theory into reality.

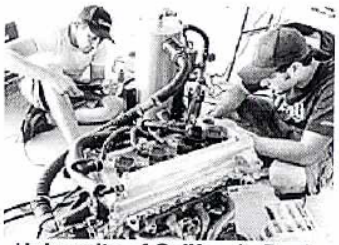
If only he knew where to begin.

"We were panicked, quite frankly," Lewis said.

Students from eight universities watched their fears dissipate as engineers from MotoTron turned their confusion into confidence.

Hundreds of students from 17 universities recently concluded their first year in Challenge X, a three-year competition to develop a Chevrolet Equinox for higher fuel economy and fewer emissions without changing performance.

Eric Bradley, MotoTron senior program manager, said teams are entering the most difficult portion of the competition.



University of California-Davis master's student Bryan Jungers, left, and senior Matt Tinney work on a Toyota Prius engine at MotoTron in preparation for the upcoming Challenge X competition. Photo by Andrew Laker

"It's no longer about ideas on paper," Bradley said. "Now it's time to see if they can build something that works."

Each team was given an Equinox, and most will replace the factory engine and transmission with a powertrain they designed, he said.

Recognizing the challenge behind building a smooth drivetrain from scratch, MotoTron volunteered to donate electrical controls that will simplify the process and it also offered to conduct training in Columbus on how to use the equipment.

MotoTron, a division of Brunswick Corp., gave more than $160,000 in hardware, software and training to assist the teams' designs and fabrication.

Bradley explained that the software will allow students to draw pictures to describe how their system should work, "and it'll do the rest."

Lewis, a computer engineering student from Mississippi State University, said his team would have been lost without MotoTron's help.

"This is not stuff you can read a book about and just sit down and do," he said.

Terrence Williams, a mechanical engineering student at University of California at Davis, said his team hit a stumbling block in getting the vehicle's controls to work properly.

So when he learned MotoTron's equipment would handle the computer engineering aspect of the project and allow him to focus on the technical realm, Williams said he was ecstatic.

"We needed a product we could use without being electrical engineers, and I'm confident we've found that," he said.

The training was a great experience for students preparing for careers, said Jim Burns, faculty adviser for San Diego State University's team.

Burns said the experience was the best technical training he ever received.

"This is beyond what universities have available to them," he said. "They've put tools in our hands that are normally available only to big companies."

Bradley said the training would also benefit companies, such as MotoTron.

By exposing students to the hardware and software used in industry, they enter the workforce with an enormous set of skills, he said.

"It's very fertile recruiting ground," Bradley said. "Our ultimate goal is for this to help us find the future engineers who will come to our organization."

Over the next two years, all 17 teams will prepare their vehicles, and the final competition will include road testing and an analysis of the final products' appeal and acceptability for consumer use.

Projects will be judged for their environmental and economic impact.

Lewis said although much work is still ahead, "at least we understand what has to be done."

Challenge X Teams

- Michigan Technological University – Attended Training
- Mississippi State University – Attended Training
- Ohio State University – Attended Training
- Pennsylvania State University
- Rose-Hulman Institute of Technology
- San Diego State University – Attended Training
- Texas Tech University – Attended Training
- University of Akron
- University of California, Davis – Attended Training
- University of Michigan
- University of Tennessee
- University of Texas at Austin – Attended Training
- University of Tulsa – Attended Training
- University of Waterloo – Attended Training
- University of Wisconsin-Madison

Attachment 12.

DELMIA? Used in General Motors/Department of Energy Challenge X Project by Mississippi State University

(Posted 09/06/2005)

Simulation software ensures fit and form of redesigned Chevrolet Equinox

Auburn Hills Mich., USA ?August 9, 2005 - Dassault Syst?es (NASDAQ: DASTY: Euronext Paris: #13065, DSY.PA), today announced the use of its DELMIA?V5 Human and Virtual NC software by the Center for Advanced Vehicular System (CAVS) at Mississippi State University (MSU) as primary engineering tools for the General Motors/Department of Energy (DoE)-sponsored Challenge X project.

The mandate of project Challenge X: Crossover to Sustainable Mobility has the MSU CAVS team focused on re-engineering a 2005 Chevrolet Equinox hybrid vehicle to reduce energy consumption, decrease emissions and maintain the performance and utility features of the compact SUV. DELMIA tools are being used for process verification of the new design. For example, DELMIA V5 Human, a human modeling package that creates and manipulates user-defined human manikins, is being used to help create an ergonomically optimal configuration of the vehicle뭘 internal controls to improve both safety and the driving experience. In addition, DELMIA Virtual NC -- a digital manufacturing tool for emulating, simulating and optimizing NC machine processes -- is being used to program CNC equipment that will create prototype parts for the Challenge X project.

To support this research program and others, the CAVS is developing curriculum to teach the principles of PLC control and robotics programming, and employing the simulation capabilities of the DELMIA product suite to verify the programs. Students will develop programs for industrial equipment and robotic arms and then simulate the programs prior to running them on real equipment. In addition, live motion capture is being incorporated with DELMIA V5 Human in order to study the motion of manikins for ergonomic considerations in the workplace.

Besides the DELMIA suite of products, the CAVS has selected the entire Dassault Syst?es V5 product line as its engineering tool platform including CATIA?for product design and SMARTTEAM?for resource management.

The CAVS was established at Mississippi State in 2001 with the support of the State of Mississippi in order to enhance the interaction of the state with the automotive manufacturing community. Its mission is to research and develop design and manufacturing means and methods for producing superior quality vehicles with advanced features and functions at reduced costs and shorter product development times, and exploiting the underlying technologies for broader industrial use. The mission also includes engineering extension, education and workforce training outreach for industry.

About DELMIA

DELMIA is a premier brand for digital manufacturing solutions, focused on two unique software applications that can be used to streamline manufacturing processes. DELMIA Automation provides solutions to digitally design test and validate the control of a machine, workcell, or entire factory line and DELMIA PLM provides

the process and resource capability to enable continuous creation and validation of manufacturing processes as related to the product throughout the entire product lifecycle. DELMIA serves industries where the optimization of manufacturing processes is critical, including automotive, aerospace, fabrication and assembly, electrical and electronics, consumer goods, plant, and shipbuilding sectors. Information about DELMIA is available at http://www.delmia.com.

About Dassault Syst?es

As world leader in 3D and PLM (Product Lifecycle Management) solutions, the Dassault Syst?es group brings value to more than 80,000 customers in 80 countries. A pioneer in the 3D software market since 1981, Dassault Syst?es develops and markets PLM application software and services that support industrial processes and provide a 3D vision of the entire life cycle of products from conception to maintenance. Its offering includes integrated PLM solutions for product development (CATIA? DELMIA? ENOVIA? SMARTEAM?, mainstream 3D design tools (SolidWorks?, and 3D components (Spatial/ACIS?. Dassault Syst?es is listed on the Nasdaq (DASTY) and Euronext Paris (#13065, DSY.PA) stock exchanges. For more information, visit http://www.3ds.com

Attachment 13.

LIVING

STARKVILLE DAILY NEWS
SUNDAY, OCTOBER 9, 2005 B

Challenge X MSU students seek to build a better car

By EMILY JONES
Starkville Daily News

With motorists' anxiety rising about as fast as prices at the pump, the push to produce a more fuel efficient car has intensified.

A group of Mississippi State University (MSU) students are way ahead of the game. They have been working for a year and a half to build a hybrid sports utility vehicle that gets better gas mileage than most small cars. The project is clicking along right on schedule and could impact the automobile industry of the future.

The students are competing in Challenge X, a three-year competition sponsored by General Motors and the U.S. Department of Energy. MSU is one of 17 universities chosen from across North America to participate. The university was selected from 53 universities applying for the opportunity to compete.

The Center for Advanced Vehicular Systems (CAVS) is providing the students with facilities and equipment as well as the expertise of faculty members who work closely with the MSU team. CAVS is a part of MSU's Bagley College of Engineering.

"The Challenge X competition has already had a tremendous impact on the instructional program in the Bagley College of Engineering at Mississippi State University," said Marshall Molen, professor of electrical and computer engineering and the CAVS faculty advisor for the Challenge X team.

"Because of their enthusiasm for automobiles, many students have been motivated to explore the technical aspects related to the many challenging problems associated with hybrid vehicles. They can learn about the most recent advances in the industry, have one-on-one interactions with automotive engineers, and have hands-on experience with the actual components."

"I've always liked fooling with cars," said Bill Bain, a mechanical engineering student who serves as business manager for the team. "My Dad could always fix things on an automobile and I guess I inherited some of that ability." He added that it wouldn't hurt to make contact with the industry reps he may be dealing later about a job.

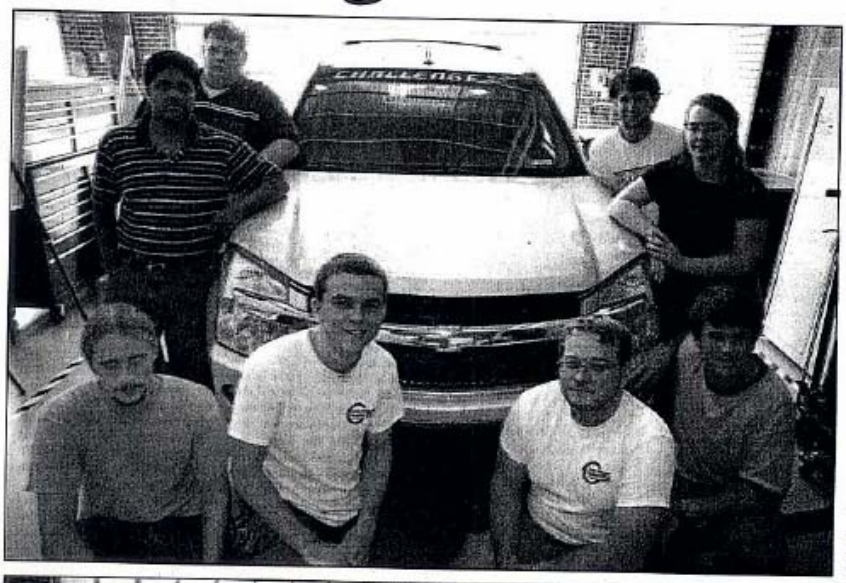
The 30 team members include engineering, communications and graphic design students. They are in their second year of a competition between the participating universities and excitement is high. At the conclusion of each year the teams are called on to report their progress. The vehicle must be driveable and meet a rigorous safety inspection by March, 2006, in preparation for the second year's competition that will be held at General Motor's proving grounds in Meza, Ariz. in June, 2006.

In June, the MSU Challenge X team attended the first year-end competition in Detroit, Mich.

After several presentations and project reports, the judges decided that the team was ready to work on a real vehicle. General Motors donated a 2005 Chevrolet Equinox, which the team is taking apart and reassembling using their own design and theories.

The MSU outreach team tied for first place overall and won first place in the media and community outreach division.

The team also took third place for their technical presentation, and second for their project initiation approval presentation.



CAVS

Becky Wilkes/SDN

Kneeling from left are Challenge X members Stephen Phillips; Bill Bain; John Gibson, Jr; and Brian Christian. From left to right standing are Jimmy Mathews, Christopher Whitt, Amanda McAlpin; and Kennabec Walp. Left, Amanda McAlpin is pictured with the 2006 Equinox which is being overhauled.

Soybeans may fuel the MSU hybrid

"Our hybrid vehicle uses a small turbo diesel engine to power the front wheels and an electric motor and rechargeable battery pack to drive the rear wheels," said David Oglesby, the team leader and a graduate student in mechanical engineering. "With this design, we are hoping to get 35 miles per gallon when the vehicle is finished while maintaining standard acceleration rate and towing capabilities."

The plans are to use a fuel combining 80 percent diesel and 20 percent bio-fuel extracted from soybeans, which is a nice fit for a state heavily engaged in soybean production.

Faced with gasoline prices headed toward the ozone layer and mounting environmental issues, consumers and auto industry leaders are watching the project with interest. The students spend hours each week transforming the gas powered vehicle into a hybrid while maintaining its high performance and drive comfort.

"Everyone is concerned about gas prices, and it's great to work on a project that could someday make a difference in that area," said Oglesby.

Local sponsors involved in the project include Amsouth Bank, NBC, TVA, 4-County Electric, Ellis Steel, Millsaps Chevrolet, Sears of Starkville, Northeast Mississippi Coca Cola, Allen Edwards Body Shop, 96.1 Radio, 94.9 Radio, and Battery Sales and Service/Trojan Batteries.

Other sponsors include Magneshocks, Inc., Audio Advantage, Gojaks, Vetronix, Matthey, Intercomp, Green Hills Software, Keene Automotive Engineering and David Riddle Company.

"I really appreciate the in-kind and financial support from the local sponsors. Without their support the team could not accomplish their goals and objectives to the degree they have," said Bob Kirkland of CAVS. "I would like to encourage others to become a sponsor since it is bringing national and international recognition to the university, State of Mississippi and the local area."

For more information on Challenge X or to inquire about becoming a sponsor, contact Kirkland at 662-325-1454.

The team is also anxious to share their progress with local groups. Any area teachers interested in having the Challenge X K-12 program, come to their classroom, please contact Amanda McAlpin at 662-325-5562.

Attachment 14.

General Motors donates to MSU team

On March 2, a representative for General Motors donated a check to the MSU Challenge X team, which will enable them to travel to competition in May to compete with other teams from across North American and Canada.

Mississippi State University was selected as one of seventeen university recipients within the United States and Canada to participate in the Challenge X Competition (*www.challengex.org*). Challenge X is a student-led engineering competition that will challenge the selected universities to create vehicle designs that will minimize energy consumption and reduce emissions. Students will follow General Motor's development process and integrate their advanced technology solutions into a 2005 Chevrolet Equinox. MSU's design is a hybrid electric architecture which incorporates an electric motor and a diesel engine.

During the check donation ceremony, Bill Beggs, an engineer from General Motors, will be donating the $7,000 check to the student team, which will cover the traveling expenses for 10 of the team's members and one faculty sponsor to compete in the competition in Mesa, Ariz., May 31-June 8.

For more information, contact Amanda McAlpin at 325-5562 or 312-8672, or by email amcalpin@cavs.msstate.edu.

Attachment 15.

Published: May 17, 2006 12:00 am

Miss St. students building a better hybrid

The Norman Transcript

CNHI News Service

MERIDIAN, Miss. -- Ten students from Mississippi State University have stopped complaining about gas prices.

Instead, they're competing in a nationwide contest to redesign the cars we drive.

The students showcased their hybrid car at MSU-Meridian Campus for U.S. Rep. Chip Pickering, R-Miss., on Monday. Pickering is vice chairman of the U.S. House of Representatives Energy and Commerce Committee.

General Motors Corp. and the U.S. Department of Energy have chosen 17 engineering schools in the United States and Canada to build a hybrid car, one powered by both both fossil fuels and electricity. The idea is to improve mileage and reduce emissions.

The contest is called "Challenge X: Crossover to Sustainable Mobility." Final competitors were chosen from a field of 60 applicants.

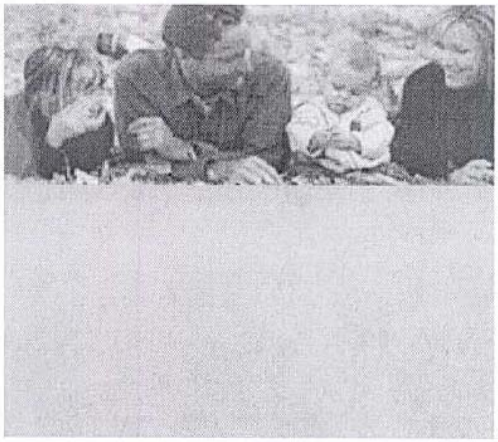
"The schools were selected in a small group of elite schools to find technology for our community that will help our country reach our needs for energy sources, so we don't have to depend on other countries to provide fuel," Pickering said.

Teams received $10,000 and a Chevrolet Equinox, the car they would use as a starting place for modifications. Each team was also eligible for $25,000 in parts and software from General Motors and other sponsors.

The cars will be transported by trailer to the General Motors proving grounds in Mesa, Ariz., for a national competition May 30 to June 8. It's the finale of a three-year competition.

Year 1: In the first year, students designed and mapped out their plans, which included a model, simulation, power train and subsystems. Each plan was evaluated and approved.

At the end of each year there was a pre-competition, where



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Tough talk on TIF

teams were evaluated on hardware, oral presentation, live simulation, a trade show booth, control strategy and a K-12 outreach program.

"At the end of first year we went to Detroit, Mich., for the pre-competition evaluation. Our plans for the hybrid were approved and we received our own Chevrolet Equinox to begin construction," said Amanda McAlpin, a communications major and leader of the outreach team.

The outreach phase of competition also included communicating with the media and community, and maintaining a Web site. The MSU team placed first in both outreach and media and community. It also took second place in design presentation and third in technical presentation.

Year 2: The students' goal is for their hybrid to exceed the factory Equinox's fuel efficiency by 50 percent.

"The stock hybrid receives 22 miles per gallon; our goal is to get 35 mpg," said Christopher Whitt, a mechanical engineering major and power train group coordinator. "Right now we are in the low 30s and plan to do some more changes to increase our numbers and hopefully get to our goal by competition."

The MSU team's car has a B20 diesel engine in the front and a computerized engine in the back. Although it is electric, it does not have to be charged through an electric outlet.

"When the accelerator is pressed, the battery is being drained, but when the car is at a coasting speed or maintaining the same rate, the battery regains its power," Whitt said.

At the second competition, the MSU students placed eighth out of 17 teams.

"Our goal is to place in the top five but increase in the areas we lacked in," McAlpin said. "If we can maintain this strategy, we should be able to obtain our goal."

Year No. 3: At the final competition beginning May 30, GM technicians will inspect the cars to approve the safety features and make sure they meet all contest guidelines. Cars will then have to pass a braking, towing and speed test.

The cars should run the same as a normal gasoline-powered model -- but without the high exhaust and gas bill.

"We would like to be in the top half of each event, but they are all different. Every team has their own strategy to win," said Kennabec Walp, a computer engineering major and controls strategy group leader.

Other competing schools include Waterloo University in Canada, Georgia Tech University, University of Wisconsin, Tennessee State University and West Virginia State University.

"There is a lot of time that goes into completing the competition. By hosting it, General Motors really gets the cream of the crop from the top engineering schools across the country," McAlpin said. "Many of our recent graduates who have worked on the car have received jobs with GM."

Pickering agreed: "Their brainpower will give us fire- and horsepower for the future."

Attachment 16.

Starkville DAILY NEWS

SERVING STARKVILLE, OKTIBBEHA COUNTY AND MISSISSIPPI STATE UNIVERSITY FOR 105 YEARS • THURSDAY, MAY 18, 2006 • VOLUME 106, NO. 137 • 50 CENTS

MSU hybrid vehicle may get 35 miles per gallon of gasol

For the Daily News

Mississippi State engineering majors are transforming a 2005 sport utility vehicle into a diesel-electric hybrid automobile they hope will get 35 miles to a gallon of gas when it's ready to roll.

The students are members of the university's Challenge X team, which is in the middle of a three-year national competition to see who can best explore and develop advanced vehicle technologies that address important energy and environmental issues.

Starkville resident Jimmy Matthews, an electrical engineering graduate student and the son of Cherian and Rachel Matthews of Bombay, India, is a member of the team.

The MSU group is among 17 teams from colleges and universities across the country that are re-engineering 2005 Chevrolet Equinox sport utility vehicles to minimize energy consumption, emissions and greenhouse gases while maintaining utility and performance.

The Equinox is a so-called "crossover" model built by General Motors Corp., which donated all the Challenge X vehicles.

"During the past two years of the competition, MSU students have devoted countless hours to designing the vehicle and are now bringing an operating hybrid to fruition," said faculty adviser Marshall Molen.

The collegiate teams — including a 10-member contingent from MSU — will gather in Mesa, Ariz., May 30-June 8 to compete in the second of three national Challenge X events. The competition presents real-world challenges to the students, while providing new ideas that could significantly alter the future of vehicle design.

"The students will have an opportunity to demonstrate how well their vehicle performs," added Molen, a power electronics research professor at the university's Center for Advanced Vehicular Systems that is supporting the students' efforts.

The MSU team has designed a diesel-electric, parallel hybrid vehicle that has an internal combustion engine running the front wheels and an electric motor running the rear wheels.

The diesel engine runs on B-20 bio-diesel, causing fewer emissions.

"When completed, our team is hoping for as high as 35 miles per gallon from the SUV," said team leader David Oglesby of Columbus, a graduate student in mechanical engineering.

Following the morning commencement ceremony May 13, U.S. Rep. Roger Wicker, R-1st District, and MSU Robert H. "Doc" gave the hybrid veh drive. The congres had been the com speaker, was amo guests and visitors ta a "Ride-and-Drive" CAVS, a state research complex d Rand German.

In 2004, the spon Department of Energ announced the 17 te to participate in the "Challenge X: Cr Sustainable Students spent thei focusing on vehicle and modeling, and development and tes phase of the comp

See 'Car' p

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from page A-1

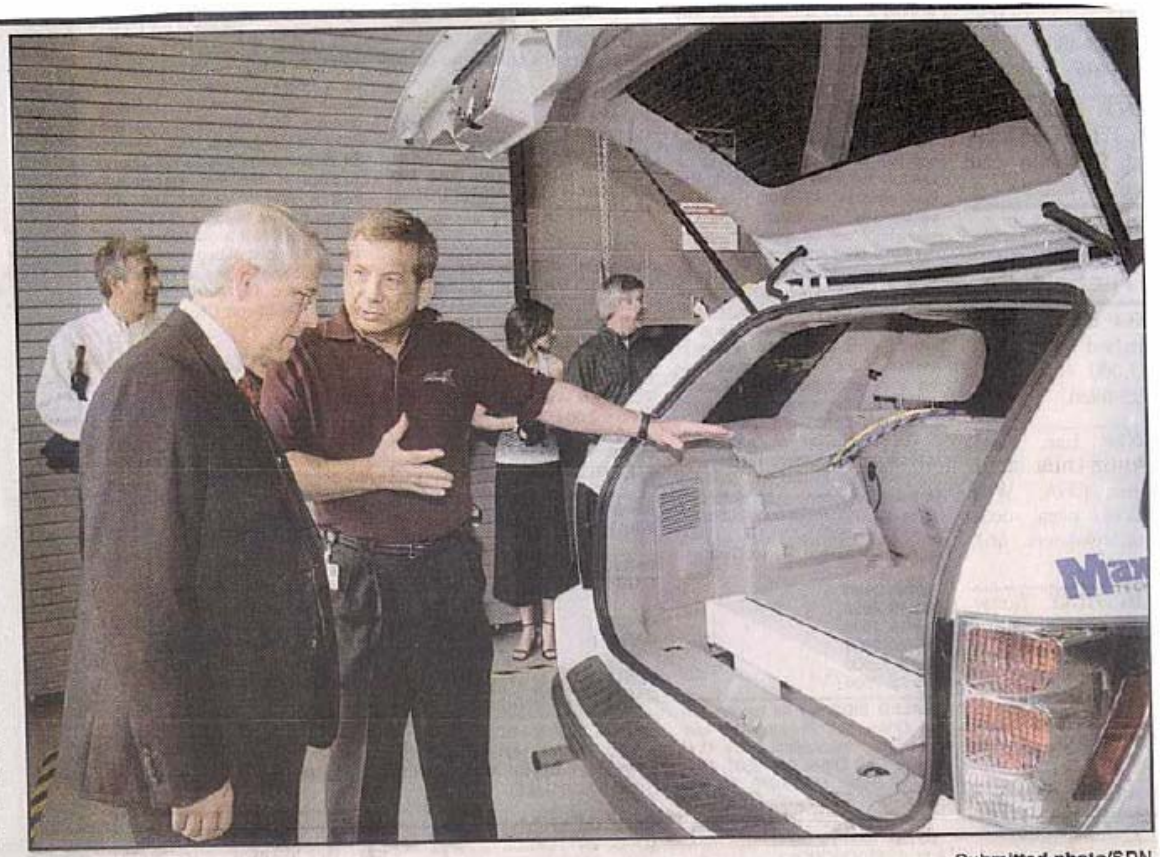
maxed a year ago with the initial national event at GM University in Auburn Hills, Mich.

For this year and in next year's concluding competition, the Challenge X teams are integrating their advanced power trains and subsystems into their redesigned vehicles.

The educational emphasis now is placed on validating the modeling and simulation tools, and using them to control and refine the vehicles.

Each participating team receives $10,000 in seed money and is eligible to collect up to $25,000 in additional production parts from GM. Award money up for grabs at the second-year competition totals more than $90,000.

"More than 30 industry sponsors also provide participating teams with leading-edge math simulation software, automotive propulsion systems, fuels, emissions-control technologies, fuel cells and other tools and technologies to compete in the program," said Bob Kirkland, CAVS staff adviser for the project. "The MSU team has an additional 31 local sponsors that provide monetary and technological contributions."

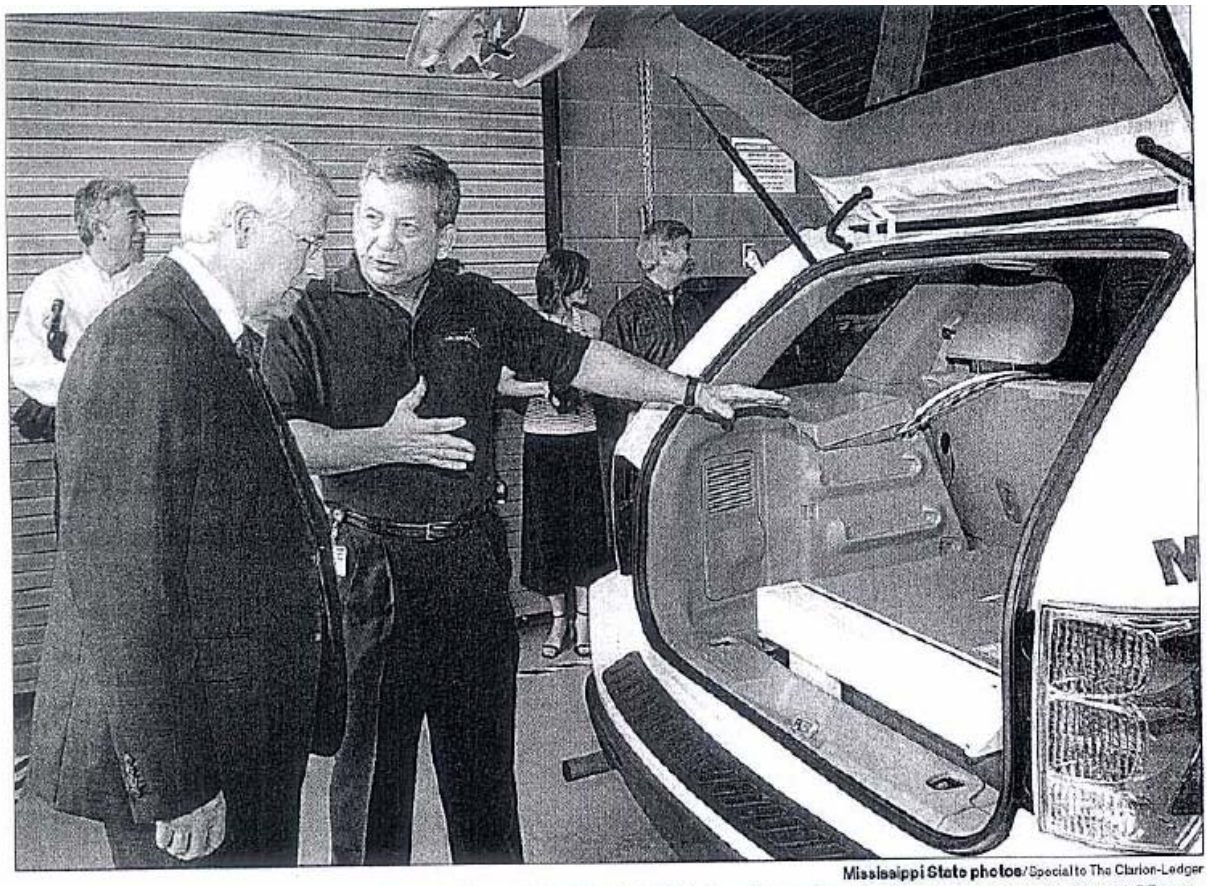


Submitted photo/SDN

U.S. Rep. Roger Wicker, left, and Mississippi State University researcher Marshall Molen inspect the MSU Challenge X vehicle.

The other 16 collegiate Challenge X teams include Michigan Technological, Ohio State, Pennsylvania State, Rose-Hulman Institute of Technology, San Diego State, Texas Tech, Akron, Michigan, Austin, (Canada), Virginia Tech, and West Virginia. California-Davis, Tennessee, Texas-Tulsa, Waterloo Wisconsin-Madison,

Attachment 17.



Mississippi State photos/Special to The Clarion-Ledger

First District Rep. Roger Wicker (left) and Mississippi State University researcher Marshall Molen inspect the school's Challenge X vehicle, a hybrid designed by engineering students and expected to get 35 mpg. The vehicle is headed for a competition in Mesa, Ariz., this week.

MSU favorite in auto contest

Team's fuel-saving SUV to be tested in Ariz. this week

By Richard Lake
rlake@clarionledger.com

For Chris Whitt, the hardest part about turning a perfectly normal, gas-guzzling SUV into a penny-pincher's dream was squeezing the second motor in there.

ONLINE
clarionledger.com

Related items: Challenge X teams; Challenge X goals

Whitt, a graduate student studying mechanical engineering at Mississippi State University, and a team of MSU engineering students have spent the last two years turning a 2005 Chevrolet Equinox into a fuel-saving hybrid.

The MSU students are one of 17 teams from universities across the country competing in Challenge X, a U.S. Department of Energy contest where engineering students convert a standard SUV into a more environmentally friendly vehicle.

"So far, we've been recognized as one of the leaders of all 17 teams," said Bob Kirkland, the MSU team's staff advisor.

They'll travel to Mesa, Ariz., next week, to GM's Desert Proving Ground for a week's

BY THE NUMBERS

- **23,400:** Estimated number of hours spent working on Mississippi State University's Challenge X hybrid vehicle
- **$120,000 to $140,000:** Estimated cost of building the vehicle
- **35:** Estimated miles per gallon of gasoline for the vehicle

Source: Bob Kirkland, Challenge X staff adviser

gasoline-powered V-6 used to be.

The second engine was trickier to place.

It is electric and sits in the back, underneath where the spare tire used to be.

Kirkland, business development officer at MSU's Center for Advanced Vehicular Systems, said teams, which began the competition in 2004, spent their first year designing the vehicle on a computer.

They spent the next year actually building the thing.

They'll be ranked this year on how closely their working vehicles adhere to those designs.

"They've done exceptionally well," said Kirkland.

Judges will focus on emissions, acceleration, fuel efficiency, and how well the vehicles tow a trailer and perform on and off the road. All the teams are modifying Chevy Equinoxes.

MSU's team leader, David Oglesby, a graduate student in mechanical engineering, said

"It's been a valuable education," he said. "Probably the best I've ever seen. It's unbelievable."

The team elected to use an electric motor powered by a 200-pound battery to run the rear wheels. An engine that runs on 20-percent bio-diesel will power the front wheels.

They'll have to follow all the government's safety regulations, and the vehicle will have to appeal to real consumers; it can't be some sort of robot-looking zombie car.

It's been an expensive ordeal. Kirkland said the car will be worth more than $100,000 when they're done. Most of the money has come from corporate and local sponsors, he said. And they need more.

Team members have put tons and tons of work into it, too, Oglesby said. He estimated an average of 25 hours a week for all nine team members over the last two years — more when deadlines were looming.

That's more than 20,000 hours in all.

"It's like a full-time job," said team member

Attachment 18.

May 24, 2006

MSU favorite in auto contest

- Team's fuel-saving SUV to be tested in Ariz. next week

By Richard Lake
rlake@clarionledger.com

Mississippi State photo/Special to The C-L

First District Rep. Roger Wicker (left) and Mississippi State University researcher Marshall Molen inspect the school's Challenge X vehicle, a hybrid designed by engineering students and expected to get 35 mpg. The vehicle is headed for a competition in Mesa, Ariz., this week.

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Mississippi State photo/Special to The C-L

They're hoping it'll get 35 miles per gallon got about 22 mpg when they started.

The car is powered by a four-cylinder dies perfectly under the hood, where the gasoli used to be.

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MSU's team leader, David Oglesby, a graduate student in mechanical engineering, said nine full-time team mei
Kirkland and faculty advisor Marshall Molen will take the trip on Tuesday.

He said he hopes to get into vehicle design after graduation, so working on Challenge X has been like a real-wo
experience.

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all nine team members over the last two years - more when deadlines were looming.

That's more than 20,000 hours in all.

"It's like a full-time job," said team member Whitt, who oversees engineering of the drive train and who said h
absolutely no time for a personal life.

"I pretty much claim the Challenge X vehicle as my wife."

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- **Teams participating in Challenge X**
- **Goals of Challenge X Teams**

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May 24, 2006

Teams participating in Challenge X

The Clarion-Ledger

Teams participating in Challenge X:

- Michigan Technological University
- Mississippi State University
- Ohio State University
- Pennsylvania State University
- Rose-Hulman Institute of Technology
- San Diego State University
- Texas Tech University
- University of Akron
- University of California, Davis
- University of Michigan
- University of Tennessee
- University of Texas at Austin
- University of Tulsa
- University of Waterloo

- University of Wisconsin-Madison
- Virginia Tech
- West Virginia University

Source: www.challengex.org

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- **MSU favorite in auto contest**

May 24, 2006

Goals of Challenge X Teams

The Clarion-Ledger

Goals of the Challenge X teams:

- The Challenge X teams will construct vehicles that, when compared with the stock vehicle, significantly reduce well-to-wheels energy consumption;
- Incorporate technologies that increase energy efficiency and reduce fossil energy consumption and emissions;
- Significantly reduce tailpipe emissions and greenhouse gases;
- Increase fuel economy; and
- Maintain or exceed consumer acceptability in the areas of performance, utility, and safety.

Source: www.challengex.org

Related Articles:

- **MSU favorite in auto contest**

Attachment 19.

>>> "Barry Ward" <BWard@its.msstate.edu> 25-Apr-06 3:19 PM >>>
Dear Dr. German,

I would like to take this opportunity to thank you, Bob Kirkland, and all the students for a very professional, and insightful presentation on the ChallengeX project that was done for our Civitan Club on this past Monday at the CAVS facility. All the students did an excellent job explaining the various areas they were working on and the challenges that they faced. I believe Mississippi State has a very capable team and after examining the vehicle I believe they will serve Mississippi State well in this competition. Again, I'd like to thank the ChallengeX team for the presentation and I look forward to updates as this competition progresses.

Best Regards,

Barry Ward

Systems Analysts
Information Technology Services