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.](image)
Figure 4. The Equinox has a small visitor at Discovery Day.

- **Presentation to East Mississippi Community College students**
  - **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.
Summary of Challenge X in CATIA Operator’s Exchange Conference Presentation

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.
• **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
  Description – General overview of Challenge X and MSU’s progress in the competition, recruitment of members.

• **Presentation to AIAA Aerospace Association**
  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**

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*Figure 8. COE Conference*
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.
• **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 Participants** - 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.

![General Motors check donation](image)

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.*

- **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.*

\[\text{Figure 16. The team poses with Jordan Keasler and his science fair project.}\]

• 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.
Vehicle Gets Paint, Students Get Money

The Equinox has a fresh coat of paint. The new colors incorporate MSU’s colors of maroon and white and make the Equinox quickly recognizable and distinguishable from the other vehicles belonging to teams in the competition. The painting was done by Allen Edward’s Body Shop earlier in the month. The Equinox is white with a maroon stripe running around the bottom of the vehicle. The paint job is decorated with the Mississippi State University logo on the hood, and bears the number 15, the team’s assigned number in the competition. The vehicle will soon be adorned by decals of logos of the Challenge X sponsors from around the country. One decal will belong to Allen Edward’s Body Shop in recognition of their donation of time and resources that went into painting the vehicle. “We really appreciate the generosity of Allen Edward’s Body Shop in painting our vehicle,” said David Copley, team leader. “They did an outstanding job and the Equinox is going to look great at this year’s competition.” The new paint job is just in time for travel to this year’s competition in Mesa, AZ, a trip that has now been funded by General Motors. On March 2, Bill Boggs, the team’s mentor from General Motors, brought a check for over $7,000.00 to the university. The check will cover airfare and hotel for 10 students and one advisor. The team will travel to the 10-day competition in Mesa, AZ on May 30.

The Equinox now reflects Mississippi State University school colors: maroon and white.

If you would like information on how Challenge X can visit your school or K-12 group, please contact Amanda McAlpin at amcalpin@cavs.msstate.edu.

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.

“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 who attended the workshop. The students had opportunities to make personal contacts with GM engineers and recruiters from Challenge X sponsoring companies.

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 engineering undergraduate student Brian Christian. Marshall Molen, a distinguished professor of electrical and computer engineering and the team’s 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.

“His 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.

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 engineering undergraduate student Brian Christian. Marshall Molen, a distinguished professor of electrical and computer engineering and the team’s 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.

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. 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.
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 Germain.

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 Mollen, 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 powers bring new attention to MUS's research
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 Herdon 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,

[Signature]

Amanda McAlpin
Outreach Coordinator for MSU Challenge X Team
Mississippi State University
Attachment 5.
Bush will send troops to border

WASHINGTON (AP) — President Bush, trying to build momentum for a border security bill that has hit a wall in Congress, is sending 1,200 National Guard troops to the border with Mexico and seeking to sharply reduce legal immigration for HDU as a way to stem illegal crossings.

"We have not ruled out any options," White House spokesman Tony Snow said Sunday.

The president is considering a mix of measures, including a plan to require workers to verify their legal status using a new national database. The White House also is drawing up contingency plans to deport immigrants living in the United States illegally. The administration is weighing legal challenges to the bill in court and asking the Supreme Court to hear the case.

The White House said it would provide details of the plan later this week.

Supervisors argue over plans for Sears building

In what has become a familiar scene, the Los Angeles County Board of Supervisors will debate whether to allow the construction of a new Sears store on a site currently occupied by an existing Sears store. The current store is located in the heart of downtown Los Angeles.

The board will vote on whether to approve the new Sears, which would be located on the site of an old Sears store that was torn down in the 1980s. The new Sears would feature a modern design and would be completed in 2010.

MSU students build a better ‘hybrid’

MSU students are working on a new type of hybrid car that is more efficient and more environmentally friendly. The students are using solar panels to power the car and are also experimenting with different types of fuels.

The car is currently in the prototype stage and is expected to be completed within the next year. The students are hoping that their car will be a significant improvement over other hybrid cars currently on the market.
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 Ladingham of Jackson; Ron Lewis of Heidelberg; David Oglesby of Columbus; Brian Christian of Slidell, La.; and Stephen Phillips of French Camp.

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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
Team Members Attend Fall Workshop

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 Kennabeck 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.

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 Control
After having run quite a few simulations in PSAT for analyzing both the default and newly-derived 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 computing 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 Kennabeck 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
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.

“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-blowing,” 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 love the 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 face.”

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.
Year 2 Presents Challenges, Opportunities

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. 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 Kennapec 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 Wait

**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!

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**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!

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**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.

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**“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

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**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 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 world 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.

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 up to speed. 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.
Wisconsin Team Visits MSU

A visit from the Wisconsin Challenge X team ended with a running diesel engine last week as the two teams collaborated forwork 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

**Thrust Update Area: What are they working on?**

**Vehicle Modeling and Controls**
Jimmy has been working on our control strategy.
Kennahec 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 Leader: Jimmy Mathews and Kennahec 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 male 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*
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.

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 are 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 Millsap Chevrolet-Ford-Pontiac-Buick and GMC.

But the silver 2005 Chevrolet Equinox is about to be taken part and subjected to a sort of auto makeover that could revitalize the industry.

Described as a "crossover vehicle," the brand new automobile combines elements of a compact utility vehicle and 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 on 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 in the Third Ward in Starkville, June 30, and then driven back to the Starkville campus.

"A team of some 30 engineering students will work with CAVS personnel to develop advanced automotive propulsion, fuels and emissions-related technologies during the course of the program," said Kirkland, business development officer for CAVS.

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

"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 essential elements as fuel cells, propulsion systems, fuels, emissions technology, and raw materials.

For more information contact Kirkland at 323-1454 or log onto http://www.challengex.org for more information.
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 Melton and Justin Crappa. In the background (l-r) are staff adviser Bob Kirkland, Ron Lewis, Christopher Whitt, CAVS staff member Amanda McAlpin, Kennesaw Web, Matthew Tucker, Teri Christian, Brian Christian and Jimmy Matthews.

(Jul 13, 2005 Photo by Megan Bean)
Engineers turn confusion into confidence

By Chrissy Nethercutt
cherecut@therepublic.com

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

“Tired and exhausted,” 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's senior program manager, said teams are entering the most difficult portion of the competition.

“It’s not 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 if I’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
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 vehicle's 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](http://www.delmia.com).

**About Dassault Systèmes**

As world leader in 3D and PLM (Product Lifecycle Management) solutions, the Dassault Systèmes group brings value to more than 80,000 customers in 80 countries. A pioneer in the 3D software market since 1981, Dassault Systèmes 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 Systèmes is listed on the Nasdaq (DASTY) and Euronext Paris (#13065, DSY.PA) stock exchanges. For more information, visit [http://www.3ds.com](http://www.3ds.com)
Attachment 13.

LIVING

Challenge X

MSU students seek to build a better car

By EMILY JONES

With materials, money, time and human energy on the line, the push to produce a more fuel efficient car is intensifying. A group of Mississippi State University students are at the heart of the game. They have been working a year and a half to build a hybrid sports utility vehicle that gets better gas mileage than standard models. The project is costing about $200,000 and will take another $100,000 to complete, which is a huge effort for a team that's already engaged in research and development.

The team leader, an engineering manager, says the students are working on a project that could make a difference in the future. The team is also working on a project that could help the university take an important step forward. The team is working on a project that could help the university take an important step forward.

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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 America 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.
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.


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 point 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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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 Kennebec Waip, 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.
MSU hybrid vehicle may get 35 miles per gallon of gas
MSU favorite in auto contest

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

By Richard Lake

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

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

The MSU students are one of 17 teams from universities around 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 chief advisor.

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

"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 30-percent biodiesel 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 the same sort of robot-looking monster car.

"It's been an expensive ordeal," Kirkland said. "I think 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 in hours and tons of work into it, too, Oglesby said. He estimated an average of 2.5 hours a week for all 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@clarion ledger.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.

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 the national student challenge known as "Challenge X," a U.S. Department of Energy contest where engineering students design cars that get 35 miles per gallon.

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

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

They're hoping it'll get 35 miles per gallon when they test it.

The car is powered by a four-cylinder diesel engine.
Challenge X staff adviser Kirkland, business development officer at MSU's Center for Advanced Vehicular Systems, which began the competition in 2004, spent their first year designing the vehicle.

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 the road. All the teams are modifying Chevy Equinoxes.

MSU's team leader, David Oglesby, a graduate student in mechanical engineering, said nine full-time team members and 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-world experience.

"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 can run 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 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 Whitl, who oversees engineering of the drive train and who said he 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

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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

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- MSU favorite in auto contest
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 Analyst
Information Technology Services