Solar Decathlon

Energy We Can Live With

September 2001

Director's Note

My summer was one of the best ever, although recent events deeply sadden and disturb me as I write this. But time will heal our wounds, and we will carry on. And we will carry on with more determination and fortitude than ever. Next summer will certainly be different from this one, because next summer most of you will be busy training to live and work in your fully functional Solar Decathlon houses. By this time next year everything will be working flawlessly—team and house will be working together in perfect harmony. You will be most concerned with making arrangements to get to Washington, D.C. The design, construction, and training phases of your projects will be complete, and you will be looking forward to the competition with anticipation. There will be nothing normal about next summer, but your hard work and perseverance will produce rewards that will exceed your expectations.

I will savor my memories of this summer—one of my best. I have been waiting for this new millennium to get jump-started, and for me, it's now off and running with all the excitement and promise I felt watching the fireworks New Year's Eve.

Two events from this summer stand out. The first is the American Solar Challenge this past July. I had the privilege of working with teams racing across country down historic Route 66. We had an exciting race and the best event I've experienced in years. The other exciting event of the summer was getting a call from the *Good Morning America* producers in New York, saying they were interested in the Solar Decathlon. Mike Janes (from the American Institute of Architects) and I went to the ABC studios in New York City on August 21st and met with the associate producers, who are very interested in extensive coverage of the Solar Decathlon. You wouldn't believe how good it felt to know that producers stop and take notice!

The Solar Decathlon will have many benefits. In light of the events of the past week, I believe our work takes on even greater importance. Although deeply saddened, I feel a stronger call to action. You see, our objective is to improve the human condition. Not just for Americans, but for everyone the world over. The sooner we can raise the quality of life for all, the sooner we will have peaceful coexistence on our small planet.

Richard King

Welcome Solar Decathlon Teams!

The U.S. Department of Energy (DOE) has welcomed fourteen schools into the Solar Decathlon competition with a seed fund of $5,000. The teams that will compete in October 2002 in Washington, D.C., are these:

Auburn University

Carnegie Mellon University

Crowder College

Texas A&M University

Tuskegee University

University of Colorado at Boulder

University of Delaware

University of Maryland

University of Missouri—Rolla

University of North Carolina—Charlotte

University of Puerto Rico—Mayagüez

University of Texas at Austin

University of Virginia

Virginia Polytechnic Institute and State University

We welcome all students to the competition, and look forward to working together.

NREL

bp solar

AIA

In April 2001, DOE, NREL, BP Solar, and AIA hosted a kick-off reception and workshop in Washington, D.C., for the 2002 Solar Decathlon teams. Pictured here, DOE's Richard King presents a certificate of acceptance to the University of Puerto Rico's team.

PIX10041

Coming up!

Web Sites

Each Solar Decathlon team must submit the Internet address for its Web site to the organizers by October 1, 2001. These Web sites will be an opportunity for the teams to show the world what they have been working on and what they plan to do. As soon as the sites have been approved, the public will be able to access them from the main Solar Decathlon Web site. Although teams are expected to describe the design of their houses and the technologies used in them, they are not expected to compromise their competitive edge.

The Web site is part of the Graphics and Communication contest, and this first judging phase will be scored pass/fail. At this time, each site must consist of a minimum of three pages. Judges will be looking for compliance with criteria listed in the Rules and Regulations under Contest 3. The criteria include these:

- Adherence to standards and inclusion of specified content (e.g., sponsor logos); see the Solar Decathlon subsite for these requirements
- Consistency and ease of use
- Accurate data, correct spelling and grammar
- Creative and engaging content
- Limited use and tasteful integration of an individual team's sponsor logos and other marketing materials.

To submit your team's Web site, simply email the URL to the Solar Decathlon Webmaster at solar_decathlon@nrel.gov. Please type "*your team's* Web site URL" (e.g., TAMU Web site URL) in the subject line. We will send confirmation that the message was received. After the Solar Decathlon organizers receive the URLs, a panel of judges will evaluate the Web sites and either send a message indicating approval or a message indicating necessary improvements. If revisions are required, teams will receive a message regarding necssary improvements (by October 26, 2001). Teams whose sites need improvement are expected to finish corrections by November 9, 2001. We look forward to receiving your entries and we will link to each site from the main Solar Decathlon Web site as we are satisfied that each site meets required standards.

Design Reports

In addition to the Web site deadline on October 1, 2001, the next significant date in the Solar Decathlon schedule is December 4, 2001. At that time, teams will be required to submit design reports containing technical information describing their buildings' designs. This report must contain all information concerning Technical Documents, Solar Cell and Battery Approval Data, and the Design Presentation and Simulation contest requested in the Rules and Regulations. This is a qualifying step, and approval of this report is mandatory for participation in the Solar Decathlon. The organizers will provide feedback to teams identifying deficiencies and requirements for final approval as early as possible. This feedback process may continue until June 1, 2002, when the teams must have an approval rating for this report.

News from the Master

The comments and questions you send to the Solar Decathlon Webmaster help the organizers more completely comprehend and plan for this exciting, complex event. In August, the organizers scheduled a retreat during which student concerns, such as the event schedule, were discussed in detail. Here is the ***preliminary*** event schedule developed at the retreat.

9/19/02	Check in, begin assembling houses
9/20/02–9/23/02	Assembly of houses
9/24/02–9/26/02	Inspections, scrutineering, installation of instrumentation
9/27/02	Continue inspections, scrutineering, and installation of instrumentation; ***media/legislators/ public tours (required)***
9/28/02	Begin solar power ***only*** to houses—8 AM; ***media/legislators/public tours (required)***; final inspections and scrutineering
9/29/02	***Media/public tours (optional through 10/4/02)***; judging for Design and Livability; Panel of Five Judges scoring for other contests (continues for the week)
9/30/02–10/01/02	Core contest activities (CCA): Energy Balance, Comfort Zone, Lighting, Hot Water, Home Business, Refrigeration, and Getting Around contests scoring begins 8 AM; shower test (morning and evening), dishwashing (morning); Web site update and newsletter
10/02/02	CCA (previous day) and begin 24-hour Comfort Zone evaluation period at 8 AM. Adjust thermostats to maintain 70°–74°F internal temperature; complete one load of laundry before 5 PM.
10/3/02	CCA (previous day, laundry excepted); end Comfort Zone Evaluation at 8 AM, houses may return to 69°–78°F temperature range.
10/4/02	CCA (previous day); complete one load of laundry before 5 PM; all contests end at 5 PM.
10/5/02	***Public/media tours (required)***; final rankings announced after assessment of penalties; awards ceremony.
10/6/02	***Public/media tours (required)***; remove instrumentation.
10/7/02	***Public/media tours (required)***; remove instrumentation; solar operation of house may discontinue at 5 PM.
10/8/02–10/9/02	Disassembly of houses
10/10/02	Teams must be off the National Mall by 5 PM

Please send any feedback on the schedule to sdrules@nrel.gov.

Organizers are developing an overall installation plan for the Solar Decathlon. The Mall will be crowded during assembly, and close coordination will be essential to avoid having teams get in each other's way. Each team can contribute to smooth installation by designing its entry for rapid assembly. Maximum use should be made of modular elements that can be easily unloaded and sited, so large vehicles can be moved out quickly. Our goal is to permit maximum flexibility for each team while reducing congestion and living within strict National Park Service rules for groups using the Mall. Teams are expected to function within the guidelines of the installation plan. We will keep you posted as the plan evolves.

Mark Eastment.

Logistics

Holding the Solar Decathlon on the National Mall has both advantages and disadvantages. Teams will have the advantage of displaying their talent and hard work to visitors from around the nation and the world. But holding the event at this location also presents some challenges. The National Park Service (NPS), under whose jurisdiction the Mall is managed, is extremely sensitive about the use of vehicles of any kind on the Mall. For example, cranes will not be allowed anywhere on the Mall. NPS has agreed to allow forklifts, provided they are driven over plywood that protects the grass. Although we recognize this presents a significant obstacle, your construction plans will have to overcome it. Given this difficulty, the organizers are working to incorporate sufficient time for construction and disassembly of the houses before and after the event.

In the News

Check out the new media page on the Solar Decathlon Web site at http://www.eren.doe.gov/solar_decathlon/media.html. You will find press releases and articles about the Solar Decathlon, as well as media contacts, and links to photos.

Monitoring in the Spotlight

Several teams have requested detailed information about the monitoring process and equipment the organizers intend to use for the competition. Following is a brief summary of information about the data acquisition system, as well as electrical (AC and DC), temperature, and hot water flow measurements.

Data Acquisition System

At this time, we intend to use a Campbell Scientific datalogger (CR10X) as the data acquisition system in each house. We anticipate that we will install the datalogger inside or close to the main circuit breaker enclosure. Installing the datalogger close to the circuit breaker panel will minimize the length of wire we will have to run for the numerous electrical measurements required in the competition, but some sensor wiring may extend into various rooms of the house. This may be a concern from an aesthetics point of view, as some teams may not want small sensor wiring extending visibly into their public tour spaces. We intend to discuss this issue with each team individually and invite your thoughts and comments.

Electrical Measurements

For electrical measurements we intend to use voltage transducers, current transducers, or, possibly, watt transducers to generate the sensor inputs for the Campbell datalogger. We are also considering the use of shunts and voltage dividers for DC electrical measurements. The difficulty we forsee with a shunt and voltage divider is that we will have to cut wires to install the shunts. Again, we invite your thoughts and comments.

Hot Water Flow (Hot Water Contest)

We will install a flow meter on the outlet of the hot water heater or supply at a distance of at least 10 pipe diameters. The flow meter must be installed between the hot water supply and all of the loads (i.e., clothes washer, dishwasher, and shower). The flow meter will be a light paddle-wheel type.

Temperature (Refrigeration and Hot Water Contests)

We will install thermocouples inside refrigerator and freezer compartments. Thermocouple wires will run to a data logger through the contact area between the refrigerator/freezer body and the door seal. Air leakage from the gap created by the wires will be minimized with insulating putty. For the hot water contest, we plan to install a T-junction between the flow meter and the hot water tank or other hot water supply. We will insert a thermocouple into the top of this T-junction to take water temperature measurements. If you would like more information on various types of thermocouples, visit the Omega Web site at www.omega.com.

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