

News - Spring 2001

CE-CERT Develops Mobile Laboratory

THIS BIG RIG RESEMBLES LARGE TRUCKS THAT CARRY GROCERIES AND other consumer products, but inside is a state-of-the-art emissions testing lab with global positioning satellite technology. Known as the CE-CERT Mobile On-Road Heavy Duty Emission Laboratory, the 53-foot trailer made its debut on Tuesday, March 27 at the 11th Coordinating Research Council (CRC) on-Road Vehicle Emissions Workshop in San Diego. The 44,000-pound rig is currently being tested at the California Speedway in Fontana and on highways in Riverside County.

Researchers at CE-CERT will for the first time collect high-quality, detailed emissions measurements of heavy-duty trucks under actual operating conditions, such as climbing a steep hill or changing speeds in stop-and-go driving. In the past, emissions could only be estimated from laboratory testing, or measured with less-precise handheld mobile units. The data is important for understanding the impact of heavy-duty engines on the environment, the effectiveness of new fuels, new engines and new ways to control emissions. With a better understanding of these emissions, it may be possible to design cleaner and more efficient trucks.

CE-CERT's multi-year research program, funded principally by the U.S. Environmental Protection Agency (EPA) and industry, will study emissions from heavy-duty trucks (conventional and alternative-fuel) and the effectiveness of emissions after-treatment technologies, and will develop modules for the Comprehensive Modal Emissions Model (CMEM) framework that enable modeling of heavy-duty truck emissions based on operating mode. CE-CERT has also designed a custom data acquisition and communications system to collect and correlate information from the laboratory, the tractor, and a global positioning system.

Wayne Miller, co-investigator on the trailer project and the director of the emissions and fuels group at CE-CERT, said that "the team of engineers, technicians and students who put this project together is exceptional, and we will continue to advance the science of emissions research using this unique tool." Development of the laboratory was supported by the U.S. EPA, California Air Resources Board, South Coast Air Quality Management District and six of the world's seven largest diesel engine manufacturers: Caterpillar, Cummins, Detroit Diesel, Mack, Volvo, and International Truck and Engine.

The trailer laboratory, by all accounts, was a central attraction at the CRC workshop, which took place March 26-28. Kent Johnson and Matthew Smith from CE-CERT conducted tours for an estimated 200 people representing industry, government and academic institutions. At the workshop, CE-CERT's principal development engineer Bill Welch reviewed its design and development and provided an overview of initial demonstration test data on the repeatability of driving cycles. CE-CERT staff members Tom Durbin, Ryan Wilson, John Collins, and Hongchang Zhou also made presentations. Staff members Ted Younglove and Carrie Malcolm, and graduate students Nicole



Trailer at CRC.

Davis and Lin Chen presented posters.

Team CE-CERT in Costa Rica



Team CE-CERT members in Costa Rica (l to r): Renee Cox, Kevin Sharp, Marisa Garcia, and Kurt Anderson.

THROUGH CITIES, RAINFORESTS AND MOUNTAINS, FOUR UCR STUDENTS crossed Costa Rica in a hybrid gas/electric vehicle from March 27 to April 1. Team CE-CERT members recently returned from their six-day adventure in an alternative-fuel vehicle rally called the Rally del Trópico.

"This was an opportunity to apply the skills that we have learned in the classroom," stated Renee Cox, a junior Electrical Engineering major. "Using what had been only theory, we were forced to come up with solutions on our own to solve practical problems. We were able to overcome every obstacle -- it was a group effort." Seventeen teams from Costa Rica, Japan, South Korea, and the U.S. participated in the rally; teams included

engineers and entrepreneurs with interests in alternative transportation. Kevin Sharp, also a junior Electrical Engineering major, stated that his participation in the rally has helped him find a direction for his future, and he is now considering alternative fuels and systems as a career focus. The Association to Promote Electric Vehicles sponsored the event.

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