RICOWI INVESTIGATES Hurri

Shingles survived on the steep roof at left...but the metal building adjacent was destroyed.

By Patty Wood-Shields and Kristen Ammerman

One of the most comprehensive roofing investigations of a hurricane-stricken area took place immediately after Hurricane Charley slammed into the South Florida coastline on August 13, 2004.

Under the auspices of the Department of Energy (DOE) and Oak Ridge National Laboratory (ORNL) and RICOWI (Roofing Industry Committee on Weather Issues), investigators consisting of wind engineers, roofing material specialists, insurance analysts, structural engineers, and roof consultants were trained in wind issues by a number of the country's leading scientists and others qualified in examining wind damage to roofing systems.

The teams have been in place since 1996, but until Hurricane Charley, "there has not been a wind event that met the criteria of a wind storm with a sustained wind speed of 95 mph (1 minute sustained) or greater when it makes landfall in a populated area on the continental U.S.," said RICOWI Chair Joe Wilson. Between August 17 and 21, eight four-member teams were deployed to the hurricane-damaged area and conducted investigations on all types of roofing systems. Members of the Federal Emergency Management Agency (FEMA) also assisted the teams.

Robb Smith, RRC, FRCI, was captain of the Spray Polyurethane Foam Alliance (SPFA) team. On this team at various times were Dave Roodvoets, Roger Morrison, Tom Kelly, and M.L. Rouco. The team arrived in Venice at noon on August 18 and was then dispatched. The team concentrated its investigations in Punta Gorda and Port Charlotte, where the damage was reported to be most extensive. From Wednesday through Sunday, they investigated sites, including two condominium complexes, an office building, the Ft. Meyers Beach fire station, a yacht club, and two private residences. Also investigated were a performing arts building with a BUR blow off, a middle school with a single-ply blow off, a 3-story condo, and a large metal building with metal roofing blow off.

Below: Peter Garrigus (SPRI), André Desjarlais (ORNL/ DOE), Arthur Sark (RCI), and Ross Robertson (Firestone).

cane Charley

Above: Structural metal roof panels were wrapped around a palm tree. Right: This structural metal roof system was blown off.

For the first three days, Warren French, PE, RRC, CCS, FRCI, was part of the roof tile team with Rick Olson and David Faulkner. "We looked at over 250 buildings, mostly residential (both concrete and clay tile, as well as asphalt shingles). A majority of those (227) were done during "street surveys" performed predominately in Port Charlotte to ascertain how damage diminished as one moved away from the path of the storm. The remaining buildings included in-depth surveys for residences, multi-family, condos, and commercial buildings in Punta Gorda and Burnt Store, directly in the path of the storm."

On the fourth day, French helped single-ply roofing team, with David Roodvoets and two FEMA employees, investigate severely damaged commercial buildings along a major roadway in Port Charlotte. "The FEMA guys came out at [RICOWI Director] Patty [Wood Shield's] request to assist in getting access to restricted areas," French reports. "We performed fairly in-depth surveys on four large roofs, two of which had lost all or part of their roof covering, and one (an Auto Zone auto parts store) that lost its entire roof structure, including membrane, metal deck, and open-web steel joists."

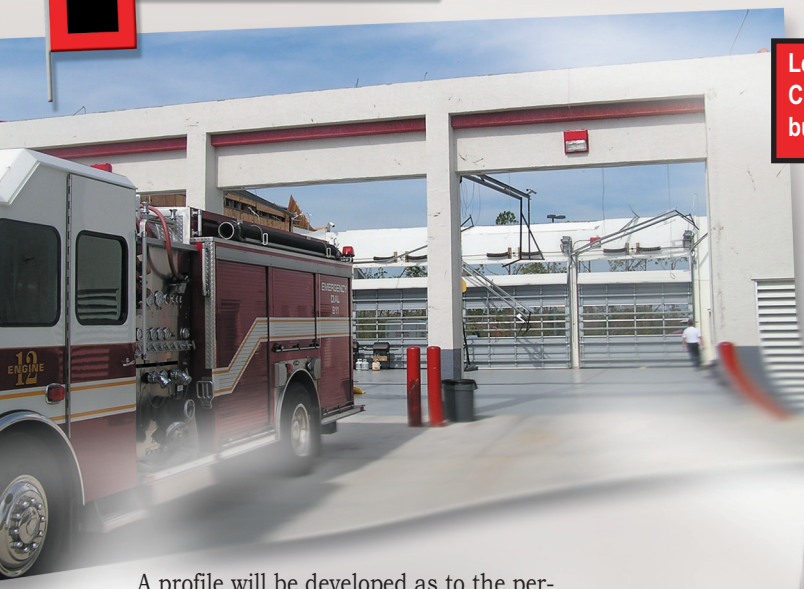
Art Sark, RRC, FRCI, represented RCI on the low-slope single-ply team with captain André Desjarlais (ORNL), Peter Garrigus (SPRI), and Ross Robertson (Firestone), For three days, the men surveyed mechanically attached, fully adhered, and ballasted systems near the center of the storm's path in Punta Gorda and Arcadia. Mixed performance results were observed., according to Sark.

All from the same location—Below left: BUR and SPF blown off phenolic foam insulation. Directly below: BUR with SPF surface blow off. Below right: Hollow core concrete deck blow off.

Photos courtesy of Robb Smith, RRC, FRCI

RICOWI INVESTIGATES

Hurricane Charley



Left: Wood truss and deck with metal roof blow off at the Charlotte County Fire Station 12 in Punta Gorda. Below: Extensive deck loss on built-up roof on Sanibel Island.

A profile will be developed as to the performance of various roofing systems in severe wind events. André Desjarlais of ORNL's Buildings Technology Center said, "ORNL has been working with private industry for some time to accelerate the acceptance of more energy-efficient and durable roofing systems. One of the major elements to be produced from this investigation will be educational tools illustrating how to design and construct more durable and energy-efficient roofs, and the serious consequences of falling short."

RICOWI will hold its fall meeting in Norman, OK, on November 16. On November 15, RICOWI members will hold a working session to finalize the draft report. A public presentation on the findings is scheduled for the spring meeting April 1, 2005 in Miami Beach, FL, in conjunction with the RCI convention.

Above: Sanibel Island BUR blow off. Left: This single-ply, only 500 yards from the photo above, survived.

RICOWI is comprised of all of the major roofing associations and includes members of academia, educational, and testing facilities and others involved in the science of roofing. RICOWI's website **(www.ricowi.com)** provides details on both RICOWI's Wind Investigation Program and its Hail Investigation Program. For further information, contact Patty Wood-Shields at paws01@charter.net.