

# Building Technology Research Unit State Farm Insurance Companies

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## 2004 Annual Report

### A. Overview and Background

State Farm organized the Building Technology Research (BTR) Unit in 1995 to investigate residential construction issues related to loss experiences. This unit resides in the Technology Division of State Farm's Strategic Resources Department, along with another complimentary area addressing automotive technology issues.

Insured losses may arise out of natural disasters, such as hurricanes, earthquakes, hailstorms, and wildfires, as well as more household-specific events such as fire, water damage, and theft.

### B. Ongoing and Completed Research

#### **Impact Resistant Roofing / Hail Catastrophe Study**

The BTR unit recently completed a study of claims from the severe April 2003 hailstorm. Hailstone sizes ranged from ½ inch to 4 ½ inches in diameter. This study provides critical information for quantifying the actual field performance of impact resistant roofing products. These results will be compared to the laboratory testing State Farm has been conducting at their research facility.

#### **Water Loss Mitigation Testing**

Engineers from the unit completed the review of a variety of whole house water loss mitigation devices. The unit also evaluated a number of different flexible plumbing water supply lines (numerous materials and manufacturers).

#### **Fire Loss Mitigation Testing**

The BTR Unit evaluated a cooking appliance that regulated the temperature of the burners. This product is designed to reduce the potential for cooking fires and would be useful where there is a concern for occupant safety.

#### **Roofing Material Testing**

A number of different types of roofing products from a variety of manufactures were tested. Roofing materials were installed on permanent exposure racks for a long-term durability (weathering) study. The racks are located at the BTR research facility in Illinois and at a separate site in Texas. An ice dam formation experiment was also designed and the test assembly constructed.

### **Electrical Testing**

Engineers completed the testing of a series of point-of-use and whole house surge protection devices. Staff also investigated electrical panels and breakers for their potential as fire ignition sources.

### **Hurricane Damage Assessment**

Several staff members participated in a variety of field activities following the 2004 hurricane season. Activities included assistance to the State Farm Catastrophe Claims Team (structural consulting), monitoring of the performance of the Good Neighbor House test facility in Deerfield Beach Florida, and participation in the IBHS/ RICOWI roof performance assessment team deployment (Hurricane Charley and Hurricane Ivan). Ongoing hurricane assessment work continues.

## **C. Outreach, Service, and Liaison Activities**

The unit is active in supporting the American Red Cross (ARC) Safe Neighbor Network Initiative. This group promotes loss mitigation and neighborhood safety at a grass roots level. The pilot phase has included over 14,000 households in 35 neighborhoods (13 ARC chapters) across the country.

Information on “Disaster Resistance for the Business Place” was presented to business owners in the Woodford County / Peoria area affected after the 2004 Roanoke, Illinois tornado. About 50 local business leaders were present. BTR shared the Inland Wind Resistant Construction Video, noted a number of websites providing additional information, and distributed information from various IBHS documents.

Unit members continue to participate in various standards and code development committees such as ASTM, AF&PA Wood Design Standard Committee, and the ICC Hurricane Resistant Construction Standard.

Unit members continue to participate in various aspects of the green building / sustainability movement and in monitoring LEED efforts.

Work continued on the American Society for Testing and Materials (ASTM) impact test protocol committee. An effort was undertaken regarding an FM ice ball test standard with Factory Mutual (FM) and the National Tile Roofing Manufacturers.

Other involvement includes Underwriters Laboratories’ (UL) Standards Technical Panel on Safety of Electric Clothes Dryers, and Safety of Gas Clothes Dryers. BTR staff participated in an UL technical panel on arc fault circuit interrupters as well as the Research Foundation’s Residential Wiring Aging Research Committee which is studying the aging of electrical systems.

A unit member was invited to serve in the Research Advisory Committee for the University of Western Ontario’s Three Little Pigs Test Facility project. Full size houses will undergo destructive testing at the test facility allowing new insights in how wood frame buildings perform when subjected to various hurricane and tornado force winds.

A BTR unit member was an invited speaker at the annual conference of the Insulated Concrete Form Association (ICFA). The group was a mix of builders, manufacturers, and associated product suppliers. The presentation communicated that while they may have a good product (ICF walls); from an insurance perspective it could be better (wind problems with roofs and attachments).

Two unit members presented a paper entitled “An Insurance Perspective on Wood-Frame Construction” at the Wood-Frame Housing Durability and Disasters Issues conference.

## D. Good Neighbor House Update

Early in 1999 State Farm Insurance opened the Good Neighbor House in Deerfield Beach, Florida. The residential-style demonstration home incorporates more than 140 features designed to provide better protection for people and to reduce property loss in the event of a hurricane, water damage, fire, or other peril. It was designed to resist a Category 4 hurricane and weathered the 2004 hurricane season without incident.

In 2002, a remote video monitoring system was installed at the Good Neighbor House. In the event of a future storm, video footage will be available to demonstrate how the GNH survived the storm. This capability complements the wind speed instrumentation at the site. This allows for correlation of the structure’s performance to actual wind speed.

A virtual reality tour of the home is available at [www.statefarm.com](http://www.statefarm.com). Since the building uses off-the-shelf technology and common building practices, the web site lists the featured products and materials as well as contact information for the manufacturers of the products. In 2004, the ownership of the house transferred to the City of Deerfield Beach with State Farm retaining research rights. The City has continued public access, helping to build awareness of construction and remodeling methods that can reduce personal injuries and property damage.

## Contact

Rose Geier Grant, AIA  
Program Director  
State Farm Insurance Companies  
Strategic Resources Department  
Building Technology Research Unit  
1 State Farm Plaza, D-3  
Bloomington, IL 61710  
Phone (309) 766-7044  
FAX (309) 766-3662  
[rose.grant.gsxj@statefarm.com](mailto:rose.grant.gsxj@statefarm.com)