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IN FOCUS

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Surfside Building Collapse: The Role of the National Construction Safety Team Act and the National Institute of Standards and Technology

Following the September 11, 2001 (9/11) terrorist attacks, there was a recognition among policymakers that no federal agency had principal responsibility for investigating building failures. To address this gap, Congress enacted the National Construction Safety Team (NCST) Act (P.L. 107-231) in October 2002 authorizing the National Institute of Standards and Technology (NIST), a non-regulatory agency of the Department of Commerce, to establish teams to investigate building failures. NCST Act authorities are similar to those of the National Transportation Safety Board (NTSB), the federal agency that investigates transportation accidents.

At about 1:15 a.m. EDT, on June 24, 2021, part of a 12-story residential building collapsed in Surfside, FL, killing at least 12 people and leaving 149 unaccounted for as of the date of this In Focus.

NIST has deployed a team of six, including the team leader, to collect first-hand information about the event. The immediate objectives for this team are to ensure that critical evidence that may be useful for a technical investigation is preserved and to gather relevant data to determine the appropriate next steps. Based on the findings of this team, the NIST Director may order the establishment of a full NCST Act technical investigation.

This In Focus describes NIST's authorities under the NCST; the process for deciding to conduct an NSCT investigation; examples of past NIST construction and in-service failure investigations; and NIST's role in the development of building codes, standards, and practices.

NIST Authorities Under the NCST

The NCST seeks "to improve the safety and structural integrity of buildings in the United States" by providing "for the establishment of investigative teams to assess building performance and emergency response and evacuation procedures in the wake of any building failure that has resulted in substantial loss of life or that posed the potential for substantial loss of life."

The NCST Act authorizes NIST to dispatch teams of experts, where appropriate and practical, within 48 hours after major building disasters. Each team must have at least one NIST employee. Teams may include private sector and university experts, representatives of professional organizations, and appropriate federal, state, and local officials. Under the act, NSCT teams are to:

- establish the likely technical cause or causes of building failures;
- evaluate the technical aspects of evacuation and emergency response procedures;
- recommend, as necessary, specific improvements to building standards, codes, and practices;
- recommend any research and other appropriate actions needed to improve the structural safety of buildings, and to improve evacuation and emergency response procedures; and
- within 90 days of completing an investigation, issue a public report of findings and recommendations.

The NCST Act authorizes NIST and its investigative teams to access the site of a building disaster; subpoena evidence; access key pieces of evidence, such as records and documents; and move and preserve evidence. Under the act, NIST may not interfere with active search, rescue, or recovery operations at the failure site. In addition, NIST investigative authorities are secondary to any criminal or terrorist investigation.

NIST does not consider findings of fault, responsibility, or negligence. No part of any report resulting from an NCST investigation may be admitted as evidence or used in any suit or action for damages arising out of any matter mentioned in such report.

Under the act, NIST is to brief the public regularly on the status of investigative proceedings and findings.

The act also authorizes the Director of NIST to establish a standing National Construction Safety Team Advisory Committee of up to 10 persons with broad technical expertise and experience to provide advice. Each year, the advisory committee is to transmit a report to Congress that includes an evaluation of NCST Act activities, recommendations to improve the operation and effectiveness of investigation teams, and an assessment of the implementation of team and advisory committee recommendations.

Decision to Conduct an NCST Investigation

According to NIST, before deciding whether to conduct a full NSTC technical investigation, NIST sends experts to the site of the building failure to collect initial information about the event. The NIST Director may order a full NCST Act technical investigation after ensuring that the event is within the jurisdiction of the National Construction Safety Team Act, and that the building material and construction type exist broadly in a region or across the country. Previous NSTC Act investigations have taken two years or more to complete.

NIST NCST Investigations

NIST has completed three NCST Act investigations:

- World Trade Center (WTC) collapses (final report on the collapse of the Twin Towers issued in 2005, final report on collapse of WTC 7 building issued in 2008);
- Station Nightclub Fire in West Warwick, RI (final report issued in 2005);
- Joplin, MO, Tornado in May 2011, the single deadliest and costliest tornado in U.S. history (final report issued in 2014).

NIST is currently conducting an NCST Act investigation of the effects of Hurricane Maria on Puerto Rico in September 2017. NIST issued a progress report in January 2021.

NIST Investigations Prior to the NCST

Prior to enactment of the NCST Act, NIST conducted a number of investigations of construction and in-service failures. These include Skyline Plaza Apartment Building Collapse, Virginia, 1973; Willow Island Cooling Tower Failure, West Virginia, 1978; Harbour Cay Condominium Collapse, Florida, 1981; Hyatt Regency Hotel Walkway Collapse, Missouri, 1981; Riley Road Interchange Ramp Failure, Indiana, 1982; Sunshine Skyway Bridge Construction, Florida, 1984; and L'Ambiance Plaza Building Collapse, Connecticut, 1987.

In 1985, Congress provided specific authority to NIST to investigate structural failures in P.L. 99-73. As codified at 15 U.S.C. §281a, the law provides that NIST, "on its own initiative but only after consultation with local authorities, may initiate and conduct investigations to determine the causes of structural failures in structures which are used or occupied by the general public. No part of any report resulting from such investigation, or from an investigation under the NCST Act, shall be admitted as evidence or used in any suit or action for damages arising out of any matter mentioned in such report."

NIST and Building Codes, Standards, and Practices

NIST is not a regulatory agency; it does not determine which building and fire safety codes, standards, and practices get adopted by state and local governments. In particular, the NCST Act specifically states that it does not confer any authority on NIST to require the adoption of building codes, standards, or practices.

NIST does support the development of building codes and standards in a variety of ways, however. For example, NIST scientists and engineers conduct research that supports the development of codes and standards, including measures of building resilience and structural robustness related to disasters, such as hurricanes, earthquakes, tornadoes, and blast and impact events; hazard characterization and structural design; materials research; understanding fire behavior and structural response to fire; and construction and in-service failures.

In particular, the NIST Engineering Laboratory's Materials and Structural Systems Division develops and promotes the use of science-based tools—including measurements, data, models, protocols, and reference standards—to improve the global competitiveness of U.S. industry through innovations in building materials and construction technology, and to improve the safety, security, and sustainability of the nation's buildings and physical infrastructure.

The laboratory's work aims to address a gap between basic research and building codes, standards, and practices through measurement science research to:

- predict structural performance up to failure under extreme loading conditions;
- assess and evaluate in-situ structural capacity using novel, smart sensing metrology, and the ability of existing structures to withstand extreme loads;
- design new buildings and retrofit existing buildings using cost-effective, performance-based methods; and
- derive lessons learned from disasters and failures involving structures.

The insights gained from this research are intended to contribute to the scientific and technical bases for the development and improvement of standards and building codes. NIST says it works actively with other organizations to ensure that lessons learned from investigations are put to use in this way.

Relevant Statutes

15 U.S.C. §§7301 et seq.—National Construction Safety Teams

15 U.S.C. §281a—Structural failures

Other Resources

NIST Building Codes and Standards

NIST Construction and In-Service Failure

NIST Materials and Structural Systems Division

NIST National Fire Research Laboratory

NCST Advisory Committee

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