Response to NCST Advisory Committee's 2020 Report to Congress

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Background Material on NCST Investigations

- The National Construction Safety Team (NCST) Act authorizes the Director of NIST to:
  - establish NCST Act Teams for deployment after events causing the ***failure of a building or buildings that has resulted in substantial loss of life or that posed significant potential for substantial loss of life***. (15 U.S.C. §7301(a))

- Under the NCST Act established Teams shall:
  (A) establish the likely technical cause or causes of the building failure,
  (B) evaluate the technical aspects of evacuation and emergency response procedures,
  (C) recommend, as necessary, specific improvements to building standards, codes, and practices based on the findings made pursuant to (A) and (B), and
  (D) recommend any research and other appropriate actions needed to improve the structural safety of buildings, and improve evacuation and emergency response procedures, based on the findings of the investigation.
  (15 U.S.C. §7301(b)(2))

Background Material on NCST Investigations

- Under the NCST Act (15 U.S.C. 7301 (b)(1)), the **purpose** of the investigations by Teams is to improve the safety and structural integrity of buildings in the United States.
- Under the NCST Act implementing regulations (15 CFR § 270.100(c)), the number of **fatalities considered to be "substantial"** will depend on:
  - the nature of the event,
  - the event's impact,
  - the event's unusual or unforeseen character,
  - historical norms, and
  - other pertinent factors.
- Under the NCST Act implementing regulations (15 CFR § 270.100(b)), **building failure** may involve one or more of the following:
  - structural system,
  - fire protection (active or passive) system,
  - air-handling system, and
  - building control system.

Background Material on NCST AC

- In accordance with 15 U.S.C. § 7310 (a) and restated in the NCST Advisory Committee Charter, the NCST Advisory Committee (Committee) shall:
  - advise the NIST Director on carrying out the NCST Act, and
  - review the procedures developed under Section 2 (c)(1) of the Act, and
  - review the reports issued as a result of an NCST investigation.

- In accordance with 15 U.S.C. § 7310 (b), on January 1 of each year the Advisory Committee shall transmit to the Committee on Science, Space and Technology of the House of Representatives and to the Committee on Commerce, Science, and Transportation of the Senate a report that includes:
  - an evaluation of Team activities, along with recommendations to improve the operation and effectiveness of Teams, and
  - an assessment of the implementation of the recommendations of Teams and of the advisory committee.

Background Material on NCST AC

- Based on the NCST Advisory Committee Charter (2016), the NCST Advisory Committee shall:
  - meet at least once per year,
  - hold additional meetings, whenever called by the NIST Director or the DFO
  - meet in person annually, and for any additional meetings, meet in person or in the form of telephone conference calls and/or videoconferences.

- Based on the NCST Advisory Committee Charter (2016), NIST may establish subcommittees from among the NCST AC members, as may be necessary:
  - subject to the provisions of FACA (Federal Advisory Committee Act), and its implementing regulations, and applicable Department of Commerce guidance., and
  - whom must report back to the parent committee, and must not provide advice and work products directly to the agency.

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Recommendation	Response
1. Data collection modes Given the circumstances that NIST researchers have encountered while undertaking investigations in Puerto Rico, and the ongoing effects of the pandemic, **we encourage the teams to give consideration to alternative means for systematic data collection that can be implemented in a timely fashion that are not reliant upon face to face, in person research methods.**	We agree. Due to the COVID-19 pandemic, phone, video conference, and web-based modes of data collection have now been implemented or are planned for most Hurricane Maria NCST and NWIRP projects. This has been particularly important for any survey or interview efforts where data collectors would need to interact with large numbers of respondents. NIST has also shifted from an in-person data collection mode for Wave 4 of its longitudinal field study of Lumberton, NC. Web and mail surveys are being used. These changes in mode were determined as necessary for the health and safety of both the data collectors and respondents. The Team is monitoring response rates and data quality in order to assess the viability of these modes for future data collection during non-pandemic times.

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2. Linking wireless communications and emergency communications Given the intent to collect survey research data about public decision making in response to emergency risk communication, **we also encourage the Hurricane Maria NCST team to coordinate their data collection efforts with the National Windstorm Impact Reduction Program (NWIRP) researchers who are focused on the physical performance of wireless communication systems.**	The Hurricane Maria Program includes both the NCST Investigation and the complementary NWIRP research study. The NWIRP research projects are led by NCST members, and the NWIRP data collection efforts are closely coordinated with the NCST projects to provide complementary data that will strengthen the findings of the NCST investigation. In coordinating these projects, the NCST members have 1) developed household survey questions on emergency communications that capture linkages to the performance of wireless communications systems; 2) defined analyses that could provide insight regarding the extent of reliance on channels associated with wireless communications for emergency messaging, as well as the relationship between these channels and decision making about response; and 3) incorporated a battery of utility questions (e.g., duration of outages, backups available) in surveys of schools, hospitals, manufacturing, and retail businesses that provide context for understanding the failure of communication systems.

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Recommendation	Response
3. Designing for tornado hazards NCST has made significant strides toward a better understanding of potential tornado wind speeds and have developed tornado hazard maps for the US. The current proposal includes tornado wind speeds that are proportional to building size—based on the probability that a building covering a larger area is more likely to be hit with a tornado, a result of the relatively small width of a tornado. Developing design loads based on the concept involves a complex engineering philosophical issue that may not be universally accepted. **NCST should be prepared for counterproposals using other philosophies.**	We agree. Since the last NCST AC meeting in June 2020, NIST has continued to work with the wind engineering community to develop and finalize the tornado hazard maps and associated tornado loads provisions for incorporation into ASCE 7-22 standard. Through ASCE balloting process, NIST, working within the ASCE-7 Wind Load Subcommittee, has satisfactorily addressed numerous ballots related to the tornado maps and loads provisions, and delivered (1) a final set of 48 maps to ASCE with GIS documentation, and (2) more than 120 pages of standard provisions, commentary, and supporting documentation that constitute the new Tornado Loads Chapter of ASCE 7-22. NIST has also conducted numerous public webinars and briefings to explain the tornado design philosophy, the maps, and process for computing design loads. This outreach was aimed, in part, at addressing counterproposals throughout balloting. At present, the tornado hazard maps and tornado load provisions have passed all ASCE ballots and are approved for inclusion in the ASCE 7-22 draft standard for public comment.

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4. ***Incremental measures for tornado shelters*** …some individuals and/or jurisdictions may want to improve their tornado protection voluntarily and such protective measures should be described incrementally so that voluntary improvements can be incorporated with cost-benefit considerations. **The Advisory Committee encourages NCST to continue to explore alternative strategies, especially the improvement of tornado shelter standards and public tornado sheltering strategies.**	We agree. NIST has been working to advance other strategies for improved public safety in tornadoes, including: • Updates to the ICC 500 Standard for Design and Construction of Storm Shelters (Recommendation 7a). • NIST is developing a proposal to incorporate the ASCE 7-22 tornado load provisions into ICC 500-2023. • NIST plans to conduct a series of workshops to identify opportunities, challenges, and best practices associated with design and operation of public tornado shelters in order to develop and publish guidelines, with FEMA and NOAA (Recommendation 8). • NIST will collaborate with FEMA to develop and publish a NIST/FEMA tornado design guide that will include consideration of commercial buildings and single-family homes (Recommendation 6).

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5. Social media data We note that NIST has engaged in exploring the possibility of obtaining and analyzing social media data for future research endeavors. We understand the complexity of data collection, storage, management, and analysis that accompanies this process, and **we recommend continued perseverance and ongoing efforts in this area.**	NIST realizes the value that social media data provides and continues to make great effort to integrate social media into its data collection process. Since January 2021, we made a new hire in the area of emergency communications to resume the work on the content analysis of social media messages. NIST has an ongoing commitment to enabling NIST researchers to ethically access, collect, analyze, and use social media data in post-disaster contexts. In the final report, NIST will include documentation of methodological considerations and best practices in the use the social media data. NIST continues to engage in learning opportunities to explore how others in the field are using social media data.

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Recommendation	Response
6. Rapid response It is crucial that **NIST capitalize on current efforts by institutionalizing the procedures and capabilities deployed for the Hurricane Maria study in order to ensure efficient and effective NCST responses in the future.** Given the importance of documenting and collecting time-sensitive data with NCST activities, **we recommend that NIST investigate whether other federal agencies, such as the NTSB, have developed protocols for quick response activities.** This could be crucial for potential future disasters such as an earthquake in a heavily populated area.	We agree. Under the Hurricane Maria Investigation, NIST continues to implement new practices to ensure efficient and effective NCST responses that extend beyond the current investigation. In June 2020, we reported to the NCSTAC that NIST was utilizing an OMB Paperwork Reduction Act Generic Clearance to increase efficiency of public information collection approvals. This year, we are pleased to report that we have cleared 4 data collection instruments using this umbrella PRA with average times to approval of less than 1 month. Most agencies estimate 6-9 months. (https://pra.digital.gov/). Additional activities include: • Consent and future data use language • Data curation and management workflows • Data portal development and approval • Documenting best practices and lessons learned in the DFS SOP • Engagement of NTSB and other agency partners

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7. Revisions to the NCST Act …we also want to restate **our recommendation to Congress that the Act be revised.** While investigations of failures of nonbuilding structures have been and could be carried out under the authorities granted to NIST in the Organic Act, in the National Windstorm Impact Reduction Program, and in the National Earthquake Hazard Reduction Program, we recommend that formal consideration be given to amending the NCST act to emphasize the important role NIST should play in such investigations. The specific changes that we recommend are appended to this letter.	While this recommendation is intended for Congress, NIST agrees that issues beyond building failures are important to examine and address. As a result, NIST is working on a variety of activities through other authorities, including: • The FEMA/NIST Functional Recovery Report (released in Jan. 2021) calls for a national recovery framework based on the desired level of function provided by buildings and lifelines following an earthquake. • The Climate Science and Building Codes Workshop (held in Jan. 2021) brought together stakeholders in building codes and standards and climate science to discuss climate science data, models, and tools. • The NIST Community Resilience Planning Guide and NIST Playbook (released Nov. 2020) provide a structured yet flexible way to set community-scale goals, align priorities and resources, and develop plans for recovery by moving the focus beyond buildings and infrastructure to the community functions performed.

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Questions?

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