

National Construction Safety Team Advisory Committee (NCSTAC)

Meeting Summary

National Institute of Standards and Technology (NIST)

Gaithersburg, Maryland

(Public Meeting conducted via web conference)

November 8, 2021

Advisory Committee Members:

Reginald DesRoches, Chair	Rice University
Ross Corotis, Vice Chair	University of Colorado, Boulder
William Holmes	Rutherford + Chekene
Jose Izquierdo-Encarnación	PORTICUS
Gary Klein	Wiss, Janney, Elstner Associates (recused from Champlain Towers Discussion)
Kimberley Shoaf	Utah School of Medicine
Jeannette Sutton	University at Albany, State University of New York

NIST Leadership

James Olthoff	Acting Director, NIST
Joannie Chin	Acting Director, Engineering Laboratory
Jason Averill	Chief, Materials & Structural Systems Division (MSSD)
Judith Mitrani-Reiser	Associate Chief, MSSD and Champlain Towers South NCST Lead Investigator

NIST Staff (listed in alphabetical order)

Regina Avila	Digital Services Librarian
Glenn Bell	Structural Engineer and Champlain Towers South NCST Associate Lead Investigator
Tanya Brown-Giammanco	Director, Disaster and Failure Studies
Benjamin Davis	Designated Federal Officer, NCSTAC
Maria Dillard	Social Scientist and Hurricane Maria NCST Associate Lead Investigator
Tina Faecke	Management and Program Analyst
Peter Gale	Administrative Office Assistant
David Goodwin	Research Chemist, Infrastructure Materials Group
Kenneth Harrison	Operations Research Analyst, Community Resilience Group
Emina Herovic	Social Scientist, Materials and Structural Systems Division
Kathryn "Jo" Johnson	Research Social Scientist, Earthquake Engineering Group
Vincent Lee	Mechanical Engineer, Dimensional Metrology Group
Marc Levitan	Research Engineer, Structures Group
Joseph Main	Research Engineer, Structures Group and Hurricane Maria NCST Lead Investigator
Sissy Nikolaou	Group Leader, Earthquake Engineering Group
Long Phan	Group Leader, Structures Group
Fahim Sadek	Research Structural Engineer, Structures Group

Kamel Saidi
Scott Weaver
Jonathan Weigand
DongHun Yeo

Acting Group Leader, Sensing & Perception Systems Group
Director, National Windstorm Impact Reduction Program
Research Structural Engineer, Structures Group
Research Engineer, Structures Group

Other Attendees

David Rodan
Sara Yerkes

Self
International Code Council

I. Welcome and Opening Remarks

Mr. Benjamin Davis, serving as the Designated Federal Officer (DFO), called the meeting to order and took roll call for the Committee members. He introduced the NIST Acting Director, Dr. James Olthoff, who thanked the Committee for their engagement and serious participation and stated that the NCSTAC and its reports are very important to NIST. Dr. Olthoff noted that the Committee would receive an update on Hurricane Maria's impacts on Puerto Rico and the Champlain Towers South partial collapse in Surfside, Florida. He also reminded the Committee of the impact their recommendations make as a result of NCST's investigations for saving the lives of US citizens exposed to varying hazards, thanked the Committee members for their contributions, and encouraged them to continue to provide advice.

II. Meeting Goals and Agenda

Dr. Reginald DesRoches reviewed the meeting's goals:

- Receive updates on the Disaster and Failure Studies (DFS) Program
- Review the status of the NCST Investigation of Hurricane Maria
- Review the status of the NCST Investigation of the partial collapse of Champlain Towers South in Surfside, Florida
- Discuss and finalize the Committee's draft annual report to Congress

III. Disaster and Failure Studies Program Updates

Dr. Tanya Brown-Giammanco delivered an update on scoring of events and enhancing the readiness of teams, focusing on three key thrust areas: statutory, procedures, and research. Her presentation can be found here:

https://www.nist.gov/system/files/documents/2021/11/05/01_BROWN-GIAMMANCO_NCSTAC_Oct2021_DFSReadiness_Final.pdf

Discussion:

Regarding the automated event scoring, the Committee asked what type of building stock data will be used. NIST responded that building size, number of stories, and type of building would be useful data. The Committee asked about the mortality model for that data. NIST reminded the Committee the mortality modeling was based on the social vulnerability index discussed during the June NCSTAC meeting; no changes were made. NIST recognizes the Committee's concern regarding the vulnerability of an area as a storm approaches, and solicited additional input.

The Committee asked if the HAZUS dataset is appropriate for the information NIST needs. Wind is part of HAZUS and NIST is exploring the possibility of tapping into that data stream for the building damage information. The Committee noted the only module in HAZUS that has casualties included is earthquakes; therefore, it would not be helpful for any of the other hazards from a mortality standpoint. The Committee noted the [SimCenter](#), a Natural Hazards Engineering Research Infrastructure (NHERI) facility at UC Berkeley, provides next-generation computational modeling and simulation software tools, including the building stock and the vulnerability of the building stock.

IV. Hurricane Maria NCST Investigation Updates

Prior to the presentation, the DFO asked if any members of the Committee had a conflict of interest, and if so, to recuse themselves. No Committee members recused themselves. Dr. Joseph Main reviewed the Hurricane Maria NCST Investigation's goals and progress. His presentation can be found here:

https://www.nist.gov/system/files/documents/noindex/2021/11/05/02_MAIN_NCSTAC_Nov2021_HurricaneMariaUpdate_final.pdf

Discussion:

The Committee reported there are still millions of dollars in Puerto Rico not being used due to the disconnection between federal regulations of different agencies and state and local governments. Training for state and local governments on how to manage funds received following a disaster was suggested by the Committee. NIST reported that NCST is mainly focused on immediate impacts in terms of damage to buildings and recovery. At least two of the NCST recovery projects, one focused on small and medium-size businesses and the other focused on schools and hospitals, will try to document the timeline and the challenges for applications and receipt of other disaster assistance funding. In addition, there is a lack of systematically collected data showing the timeline and impacts for the lag of funds received for recovery. Once we are able to document the timeline and associated challenges, NIST will be in a better position to support recommendations on how to improve recovery.

The Committee asked for a prediction of when NIST can provide an update on the wind field data collection. NIST noted March 2023 is the last date for collecting wind measurement data; however, NIST plans to analyze other data as it arrives and will provide updates to the Committee.

The Committee asked about challenges NIST foresees in extrapolating the findings of specific events (wind, flood, and rainfall) toward broader lessons for improvements in codes and preparation for responding to future events. NIST is mindful of the broader concern in planning their work and is careful to facilitate broader recommendations rather than recommendations for a specific building. In addition, the Committee questioned how broad these lessons should be and stressed the importance of the effect of topography. NIST noted the recommendations received will be posted for public comment and broader perspectives.

The Committee inquired about whether NIST had access to rich datasets for understanding interdependencies (water, power, transportation) adequately. NIST reported that there is an entire project focused on the infrastructure aspects including interdependencies related to critical delays. Phase 1 evaluations are completed but didn't contain interdependency information; however, Phase 2 of the facility (hospital) interviews includes questions regarding interdependencies.

V. NCST Investigation on Partial Collapse of Champlain Towers South

Prior to the presentation, the DFO asked if any members of the Committee had a conflict of interest, and if so, to recuse themselves. Committee member Gary Klein recused himself. The lead investigator, Dr. Judith Mitrani-Reiser, provided an overview of NIST's two-month deployment to Surfside, Florida. Her presentation can be found here:

https://www.nist.gov/system/files/documents/noindex/2021/11/05/03_MITRANI-REISER_NCSTAC_Meeting_2021Nov08_Mitrani-Reiser_final.pdf

The associate lead investigator, Mr. Glenn Bell, provided an overview of NIST's activities post-deployment to Surfside. His presentation can be found here:

https://www.nist.gov/system/files/documents/noindex/2021/11/05/04_BELL_NCSTAC_Meeting_2021_2021Nov8_Bell_final.pptx.pdf

Discussion:

Regarding Category four and five hurricanes, the Committee asked if NIST is investigating the water pressure from the sea and the wind and how that affects the building foundation on the shore. NIST reported that both the history and geotechnical projects are looking at the entire history of loading on the structure, including wind loads, in addition to anything else that had a lasting impact on the structure as well as the site and geological conditions.

The Committee requested clarification on whether existing elements in the laboratory will be tested or if specimens will be built to represent those elements. NIST responded that subsamples extracted from specimens will be tested, but the larger scale testing is visioned around mockups created.

The Committee asked if the Congressional funding and timescales are consistent with the early planning objectives and goals. NIST responded they have a lot to accomplish in two years and are currently in the process of assembling individual project teams and developing a timeline that will identify interdependencies. Due to the complexity of the investigation, it is likely the NIST's work will extend beyond two years. NIST added that their timeline and vision of financial resources are consistent with what needs to be achieved. The supplemental funds are greatly appreciated and enable NIST to maintain the momentum and assemble the teams quickly.

The Committee inquired whether there is any intention to look at where fatalities occurred and then map those in regards to evacuation. NIST responded that it is currently not included in the project plans, but the plans are still developing. Fatalities are something NIST is looking at closely and the data have already been collected by others.

The Committee requested additional details on the interview population related to the history of the buildings and codes. NIST reported interviews are being conducted by every project. NIST teams do not currently include a project leader in the social sciences area but that is a key component that will be needed. NIST will share more information regarding the interview methods during the next NCSTAC meeting.

The Committee asked for clarification, in terms of the structural modeling, and on how NIST is managing the correlation between the original plans and what was actually built. NIST reported the evidence collected and contacts they plan to draw upon, including:

- original construction records;
- people with general knowledge of construction techniques;
- specimens of the structure including the location;
- remote sensing documentation of the search and rescue information; and
- characterization of the building materials.

The Committee inquired how NIST will use uncertainty as part of the processes for the collapse. NIST reported uncertainty will be considered on everything. In addition, the NIST Statistical Engineering Division will be engaged as well as contractors to track the uncertainty quantification work across all projects.

VI. Summary Remarks

Dr. Joannie Chin thanked the NCSTAC members for their continued support and dedication. She assured them the NIST team members will continue to work tirelessly conducting each investigation, utilizing the best and brightest internal and external experts. Equally important is ensuring that NIST investigations result in necessary recommendations to codes, standards, and practices in addition to following through to ensure those recommendations are implemented to prevent similar events from occurring in the future. She asked members of the public with relevant information, knowledge, or hypothesis to submit them through the [data portal](#). Dr. Chin thanked the Committee for their engagement and noted that she looks forward to receiving their annual report to Congress.

VII. Public Comment Period

The public comment period included three speakers: a representative (Sara Yerkes) from the International Code Council (ICC) describing their recent activities related to the Champlain Towers South collapse and announcement of an upcoming webinar on Dec 7; a family member (David Rodan) spoke about their frustration with the lack of NIST findings to date and also raised various concerns (e.g., design errors, vibrations from neighboring structure construction, and proximity of adjacent building construction) that he would like NIST to explore in their investigation; and an anonymous speaker submitted their concerns about the lack of trust they have in the condo associations and local building officials and structural concerns they have with their own building (Champlain Towers East).

VIII. NCSTAC Preparation of Annual Report to Congress

The Committee reviewed the early draft report and writing assignments from the June meeting and discussed additional topics to include in their annual report to Congress. Dr. DesRoches led the discussion and asked each member to insert any additional edits directly in the shared Google document by November 19. Dr. DesRoches will circulate a final draft report on December 1 for review and final comments.

IX. Adjournment

Mr. Davis stated that a poll will be distributed to the Committee to schedule a two-day virtual meeting in June 2022. The meeting was adjourned at 3:46 pm ET by Mr. Davis.