

Disaster & Failure Studies Program Updates

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NIST's Disaster and Failure Studies Program

Statutory Thrust

- Evaluate hazard events against deployment criteria
- Manage identification, vetting, and onboarding of NCSTAC members
- Develop agenda, manage logistics, and set frequency for NCSTAC meetings
- Create annual NCST reports to Congress
- Coordinate statutory activities across programs related to disasters
- Conduct field studies under various authorities

Procedures Thrust

- DFS Standard Operating Procedures
- HOT Team membership, training, and credentials
- Field and safety protocols
- Human subjects protocols
- Manage equipment for disaster metrology and personnel protection
- Data preservation, security, and management
- Field tools (NDA's, permissions, survey instruments)
- MOUs with other agencies, academics, and others
- NIST Disaster Working Group

Research Thrust

- Research program focused on disaster metrology, including structural performance and social sciences
- Coordinate research activities with NIST EL Groups, Disaster Statutory Programs, NIST EL Divisions, and other NIST Labs
- Coordination with the Center of Excellence for Risk-Based Community Resilience Planning on field studies
- NSF/NIST Disaster Resilience Research Grants Program
- Outreach and dissemination

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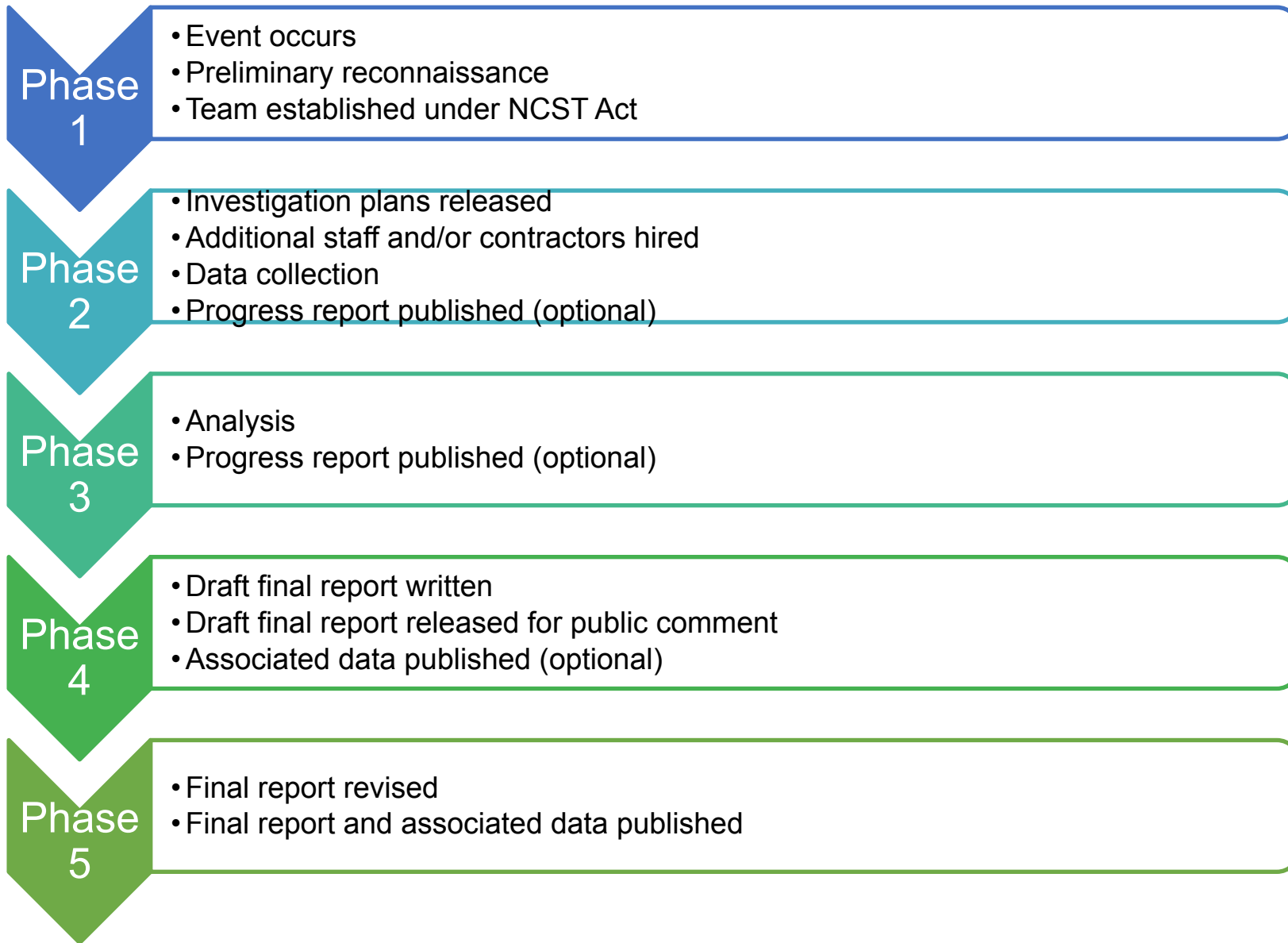
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Events Scoring

*NIST deployed a team Disasters Scored November 2021 – May 2022			
Date	Event	Event Consequence Score (max=5.0)	Evacuation & Response Score (max=5.0)
11/28/2022	Barrana, Peru Earthquake	2.1	1.0
12/10/2022-12/11/2022	Midwest Tornado Outbreak	4.4	4.0
12/31/2021	Marshall Fire (WUI), Boulder, Colorado	3.0	2.0
12/23/2021	Cleveland Parking Garage Collapse	3.0	1.0
01/07/2022	Philadelphia Row House Fire	3.0	3.0
01/10/2022	Bronx High-Rise Apartment Fire	3.5	3.0
01/24/2022	Baltimore Row House Fire	3.5	3.0
01/24/2022	Anse-a-Veau, Haiti Earthquake	2.0	1.0
03/07/2022	Silver Springs, Maryland Apartment Explosion and Fire	2.7	1.0
03/21/2022-03/23/2022	Southeast Tornado Outbreak	3.3	1.0

NCST Investigation Workflow and Requirements



Briefings of NCSTAC (open to public and press) occur throughout

NCST Investigation Timeline Example: WTC Part 1

Phase 1

- September 11, 2001: WTC 1, 2, and 7 collapse
- May 2022: Initial Model for Fires in the WTC Towers released

Phase 2

- August 2022: Investigation plans released
- December 2002: Progress report published
- April 2003: NCSTAC established and first briefing
- May 2003: Progress report published
- August 2003: Briefing to NCSTAC

Phase 3

- December 2003: Briefing to NCSTAC (open to public and press)
- December 2003: Public update provided
- June 2004: Briefing to NCSTAC (open to public and press)
- June 2004: Progress report published

NCST Investigation Timeline Example: WTC Part 2

Phase 4

- October 2004: Briefing to NCSTAC
- April 2005: Draft of final report for WTC 1 and 2 released for public comment
- September 2005: Briefing to NCSTAC
- December 2006: Briefing to NCSTAC
- December 2007: Briefing to NCSTAC (open to public and press)
- August 2008: Draft of final report for WTC 7 released for public comment

Phase 5

- September 2005: Final report for WTC 1 and 2 published
- November 2008: Final report for WTC 7 published
- 2008-present: Implementation of WTC recommendations

NCST Investigation Timeline Example: Joplin Tornado

Phase 1

- May 22, 2011: Joplin tornado occurs
- May 24-28, 2011: Preliminary reconnaissance
- June 29, 2011: Team established under NCST Act
- October 2011: Briefing to NCSTAC

Phase 2

- May 2012: Investigation plan released

Phase 3

- November 2012: Progress report published
- December 2012: Briefing to NCSTAC (open to public and press)

NCST Investigation Timeline Example: Joplin Tornado

Phase 4

- November 2013: Draft of final report released for public comment
- December 2013: Briefing to NCSTAC (open to public and press)

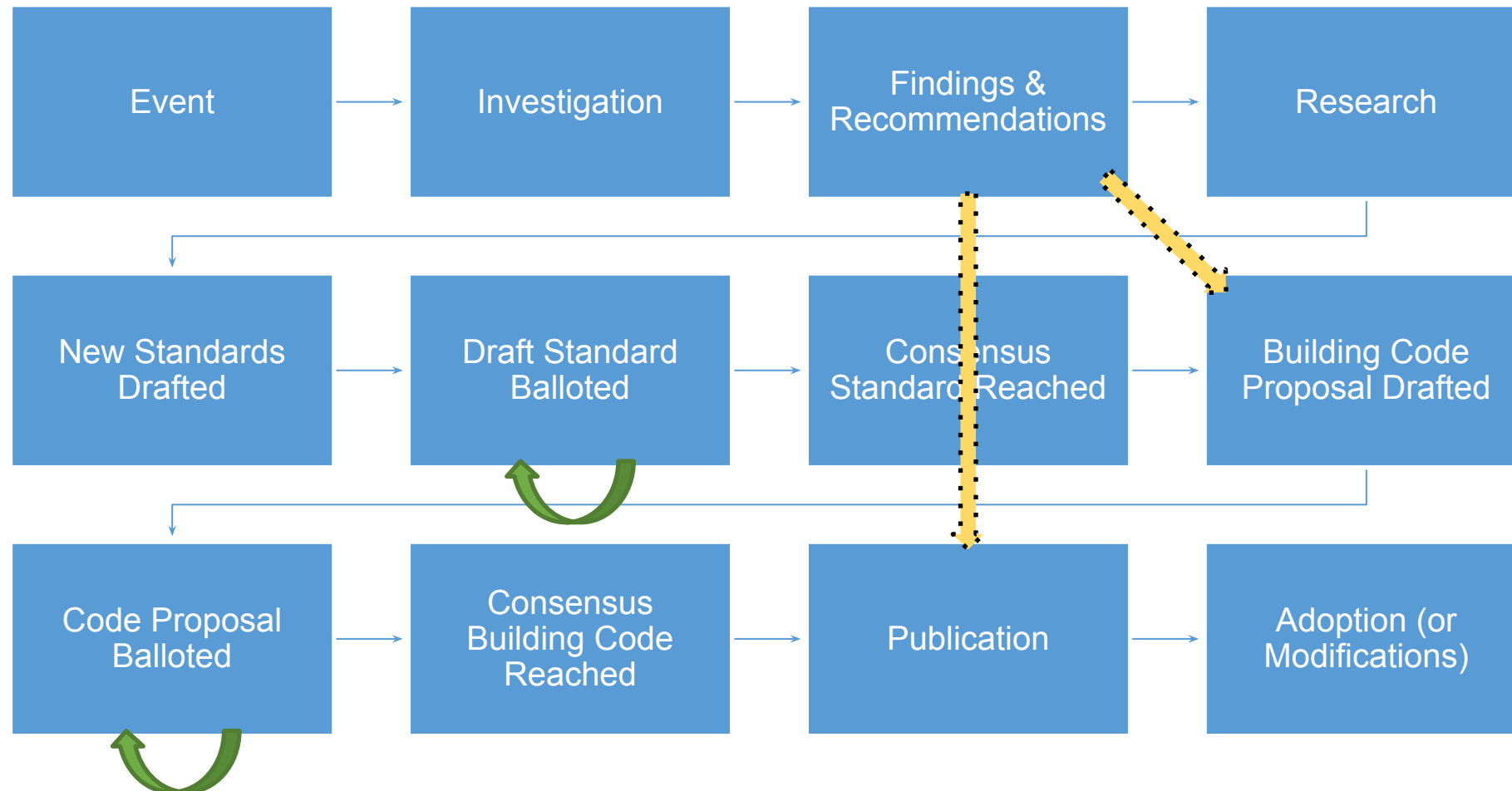
Phase 5

- March 2014: Final report published
- 2014-present: Implementation of Joplin tornado recommendations

NCST Investigation Timeline Expectations

- Timelines for investigations is highly variable
 - Funding and personnel availability
 - Contracting timelines
 - Complexity of investigations
 - Prioritization from Division, Lab, NIST, and Congress
- Commitment to see implementation of recommendations fully through completion

Implementation Example: Building Code Process



Impacts: Changes to Codes and Standards

DuPont Plaza Hotel Fire (1986)	Passage of Hotel-Motel Sprinkler Act
L'Ambiance Plaza (1987)	Improvements to OSHA safety and inspection requirements for lift-slab construction
Hurricane Andrew (1992)	Upgraded wind provisions adopted in HUD's Manufactured Home Construction and Safety Standards
Northridge Earthquake (1994)	American Institute of Steel Construction adopted design guidelines for seismic rehabilitation of existing welded steel frame buildings
Jarrell, TX Tornado (1997)	NOAA's National Weather Service adopted the Enhanced Fujita (EF) Scale for estimating tornado intensity
World Trade Center (2001)	<ul style="list-style-type: none"> • 40 ICC code changes to International Building Code and International Fire Code • 10 NFPA code changes to Life Safety Code • 2 NFPA code changes to Uniform Fire Code
Station Nightclub Fire (2003)	NFPA Life Safety Code updates to sprinklers, festival seating, crowd management, egress inspection record-keeping
Joplin, MO Tornado (2011)	<ul style="list-style-type: none"> • Tornado hazard map, tornado load design methodology and provisions included in ASCE 7 • Scope of ICC 500 expanded to include shelters in existing public buildings

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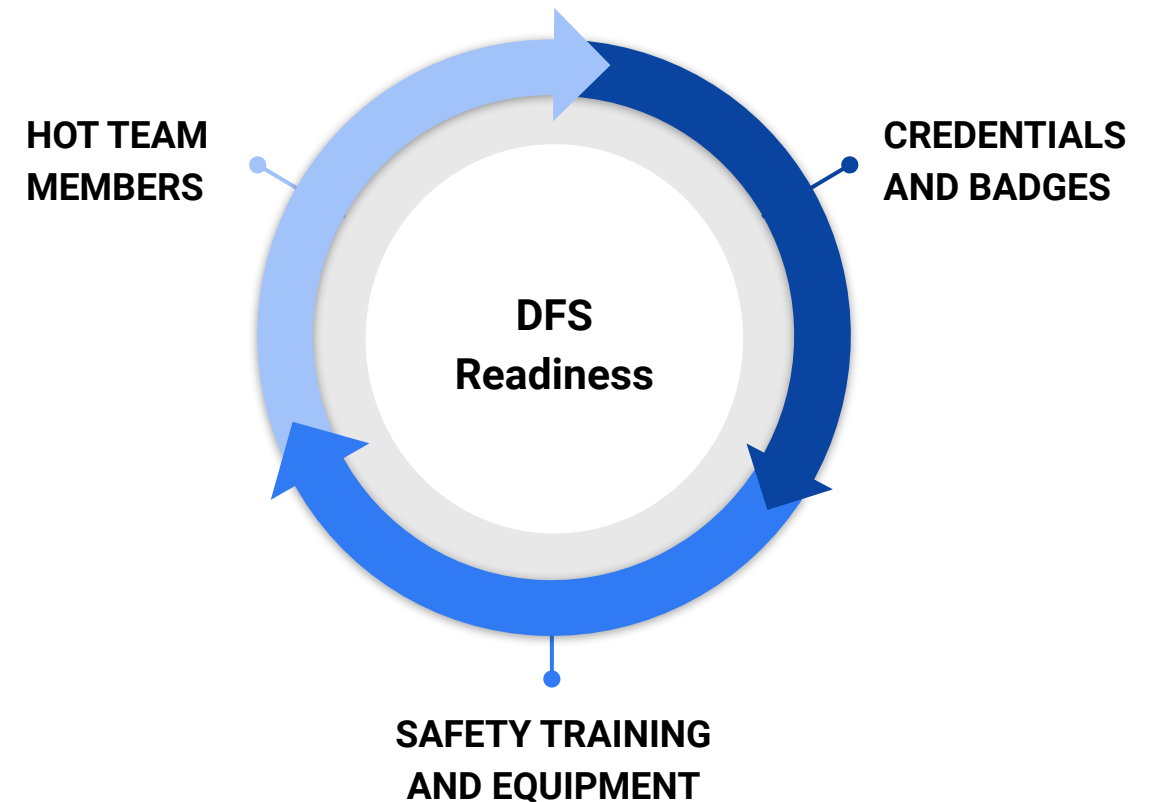
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DFS Procedures: Team Readiness

- Personnel
 - Expanded Hot Team membership from 14 to 22 people
 - Developed new “Emergency Response Official” category of membership for 13 people
- Safety
 - Training program assigned to all members; will be refreshed each winter
 - Hazard Review refreshed



DFS Procedures: Team Readiness

- New IAA with NSF; one additional IAA and MOU in process
- First Meeting of NIST “Disaster Working Group”
 - Briefed on Hurricane Maria and Champlain Towers NCST Investigations, including heads-up on upcoming needs
 - Identified five areas of interest to tackle: safety, acquisitions, administrative, travel, communications
- Upcoming focus areas
 - Organization of equipment storage and kits, check-in/out and inventory procedures
 - Refresh of DFS SOP
 - Discussions of data collection needs/brainstorming for field data tools

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Questions?

 Please 'raise your hand' using the Blue Jeans Participant window and unmute your audio and video