

Appendix O: National Construction Safety Team (NCST) Act Decision Criteria

ORANGE entries subject to change as more information becomes available

Date and Event Description: May 22, 2011 Joplin, MO				Draft 5/23/2011 9:30 am		Letvin	
Preliminary Reconnaissance Criteria ¹		Low (1)	Med (3)	High (5)			
1. Substantial Loss of Life or Disabling Injury							
A.	Single or adjacent structures	0	1 to 2	>2			
B.	Community (city, county, metropolitan area)	0 to 3	4 to 9	>10			
C.	Region (state to multi-state)	0 to 5	6 to 19	>20			
2. Significant Potential for Loss of Life: Exposed Population							
A.	Single structure (occupancy)	<100	100 to 499	≥500			
B.	Community (city, county, metropolitan area)	<1 000	1 000 to 9 999	≥10 000			
C.	Region (state to multi-state)	<100 000	100 000 to 999 999	≥1 000 000			
3. Actual Hazard							
A.	Earthquake	≤ MMI IV	MMI V to VII	≥MMI VIII			
B.	Hurricane at Landfall	≤Cat 3	Cat 4	Cat 5			
C.	Tornado	≤EF3	EF4	EF5			
D.	Coastal Inundation	< 3 ft	3 to 9 ft	≥ 10 ft			
E.	Fire Spread in a Structure	Fire spread not beyond area of origin	Fire spread throughout a structure	Fire spread beyond structure of origin			
F.	Wildland Urban Interface (WUI)	High Forest Service Fire Danger Rating	Very High Forest Service Fire Danger Rating	Extreme Forest Service Fire Danger Rating			
G.	Blast	< 99 lbs. TNT-equivalent	100 – 999 lbs. TNT-equivalent	> 1000 TNT-equivalent			
H.	Impact	< 1 x 10 ⁶ ft lb/sec	1 x 10 ⁶ to 1 x 10 ⁷ ft lb/sec	> 1 x 10 ⁷ ft lb/sec			
4. Consequences (damage and functionality)							
A.	Failure during Construction ²	Local structural failure	Partial structural collapse	Total structural collapse			
B.	Engineered Building Structures	Minimal nonstructural damage	Significant nonstructural damage Minimal structural damage	Significant structural damage or collapse			
C.	Transportation & Utility Structures	Minimal nonstructural damage	Minimal structural damage Partial loss of function	Significant structural damage or collapse Complete loss of function			
D.	Non-Engineered Building Structures	Minimal nonstructural damage	Minimal structural damage	Significant structural damage or collapse			

¹ NIST will monitor event information and continue to screen the event against preliminary reconnaissance criteria as data become available.

² Excludes construction equipment failures.

5. Need for NIST Involvement			
A. NIST Authority	Addressed by other authorities – federal, state, local – and their mission responsibility and agency expertise	Collaboration with other agencies where NIST provides complementary expertise	NIST has primary authority and/or expertise
Score: <u>30</u> / <u>7</u> = <u>4.3</u> Sum	<u>0</u> x 1	<u>3</u> x 3	<u>4</u> x 5

Additional Factors

Preliminary Reconnaissance Criteria ³	Low	Med	High
6. Stakeholder Concern⁴			
A. Federal disaster declaration ⁵	N/A	Declaration; Minimal structural damage	Declaration; Significant structural damage
B. Request by other Authorities (local, state, federal)	None	NIST provides complementary expertise	NIST has primary expertise
C. Public Interest.	Local news	State or regional news	National news
D. Unique event with potential broad implications for similar or other types of structures	Minimal impact	Moderate impact	Significant impact
Score: <u>13</u> / <u>3</u> = <u>4.3</u> Sum	<u>1</u> x 1	<u>1</u> x 3	<u>2</u> x 5

Total Score: <u>43</u>/<u>10</u> = <u>4.3</u> Total Sum	<u>1</u> x 1	<u>5</u> x 3	<u>5</u> x 5
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7. Evacuation and Emergency Response ⁶			
A. Evacuation	Normal evacuation	Moderate evacuation challenges	Significant evacuation challenges
B. Emergency Response	Normal operations	Moderate operational challenges	Significant operational challenges
Score: <u> </u>/<u> </u> = <u> </u> Sum	<u> </u> x 1	<u> </u> x 3	<u> </u> x 5

8. International Events*			
A. Codes, standards and enforcement	No building codes, standards, or enforcement	Building codes and standards, but no enforcement	Building codes and standards, with enforcement

³ Criterion 6 is only evaluated if the averaged score from Criteria 1 to 5 is between 3.0 and 4.0.

⁴ A directive by Congress or the Administration will result in Technical Investigation depending on application of the relevant decision criteria and procedures.

⁵ This factor is only evaluated for events triggering use of the National Response Framework or the Stafford Act.

⁶ To be evaluated separately to determine if evacuation and/or emergency response members are needed on the team.

B. Construction practices similar to the U.S.	Minimally similar	Moderately similar	Significantly similar
Total Score: (From 1-6) \times = Sum	$(0.7)^n$	$(0.9)^n$	$(1.0)^n$

- **n is 0,1, or 2, depending on the number of selected items under each ranking category (i.e., Low, Med, or High) for Criteria 8. The factor applied to the Total Score is the product of all three factors.**

Preliminary Reconnaissance Decision Criteria

Date and Event Description			
Preliminary Reconnaissance Criteria ⁷	Low (1)	Med (3)	High (5)
1. Substantial Loss of Life or Disabling Injury			
A. Single or adjacent structures	0	1 to 2	>2
B. Community (city, county, metropolitan area)	0 to 3	4 to 9	>10
C. Region (state to multi-state)	0 to 5	6 to 19	>20
2. Significant Potential for Loss of Life: Exposed Population			
D. Single structure (occupancy)	<100	100 to 499	≥500
E. Community (city, county, metropolitan area)	<1 000	1 000 to 9 999	≥10 000
F. Region (state to multi-state)	<100 000	100 000 to 999 999	≥1 000 000
3. Actual Hazard			
A. Earthquake	≤ MMI IV	MMI V to VII	≥MMI VIII
B. Hurricane at Landfall	≤Cat 3	Cat 4	Cat 5
C. Tornado	≤EF3	EF4	EF5
D. Coastal Inundation	< 3 ft	3 to 9 ft	≥ 10 ft
E. Fire Spread in a Structure	Fire spread not beyond area of origin	Fire spread throughout a structure	Fire spread beyond structure of origin
F. Wildland Urban Interface (WUI)	High Forest Service Fire Danger Rating	Very High Forest Service Fire Danger Rating	Extreme Forest Service Fire Danger Rating
G. Blast	< 99 lbs. TNT-equivalent	100 - 999 lbs. TNT-equivalent	> 1000 TNT-equivalent
H. Impact	< 1 x 10 ⁶ ft lb/sec	1 x 10 ⁶ to 1 x 10 ⁷ ft lb/sec	> 1 x 10 ⁷ ft lb/sec
4. Consequences (damage and functionality)			
A. Failure during Construction ⁸	Local structural failure	Partial structural collapse	Total structural collapse
E. Engineered Building Structures	Minimal nonstructural damage	Significant nonstructural damage Minimal structural damage	Significant structural damage or collapse
F. Transportation & Utility Structures	Minimal nonstructural damage	Minimal structural damage	Significant structural damage or collapse

⁷ NIST will monitor event information and continue to screen the event against preliminary reconnaissance criteria as data become available.

⁸ Excludes construction equipment failures.

		Partial loss of function	Complete loss of function
G. Non-Engineered Building Structures	Minimal nonstructural damage	Minimal structural damage	Significant structural damage or collapse
5. Need for NIST Involvement			
C. NIST Authority	Addressed by other authorities – federal, state, local – and their mission responsibility and agency expertise	Collaboration with other agencies where NIST provides complementary expertise	NIST has primary authority and/or expertise
Score: ___/___ = ___	Sum	___ x 3	___ x 5

Additional Factors

Preliminary Reconnaissance Criteria⁹	Low	Med	High
6. Stakeholder Concern¹⁰			
A. Federal disaster declaration ¹¹	N/A	Declaration; Minimal structural damage	Declaration; Significant structural damage
B. Request by other Authorities (local, state, federal)	None	NIST provides complementary expertise	NIST has primary expertise
C. Public Interest.	Local news	State or regional news	National news
D. Unique event with potential broad implications for similar or other types of structures	Minimal impact	Moderate impact	Significant impact
Score: ___/___ = ___	Sum	___ x 3	___ x 5

Total Score: ___/___ = ___	Total Sum	___ x 3	___ x 5
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7. Evacuation and Emergency Response¹²			
A. Evacuation	Normal evacuation	Moderate evacuation challenges	Significant evacuation challenges
B. Emergency Response	Normal operations	Moderate operational challenges	Significant operational challenges
Score: ___/___ = ___	Sum	___ x 3	___ x 5

⁹ Criterion 6 is only evaluated if the averaged score from Criteria 1 to 5 is between 3.0 and 4.0.

¹⁰ A directive by Congress or the Administration will result in a Limited or Extensive-Scope Technical Investigation depending on application of the relevant decision criteria and procedures.

¹¹ This factor is only evaluated for events triggering use of the National Response Framework or the Stafford Act.

¹² To be evaluated separately to determine if evacuation and/or emergency response members are needed on the team.

8. International Events*			
A. Codes, standards and enforcement	No building codes, standards, or enforcement	Building codes and standards, but no enforcement	Building codes and standards, with enforcement
B. Construction practices similar to the U.S.	Minimally similar	Moderately similar	Significantly similar
Total Score: (From 1-6) __x__ = __ Sum	$(0.7)^n$	$(0.9)^n$	$(1.0)^n$

- n is 0, 1, or 2, depending on the number of selected items under each ranking category (i.e., Low, Med, or High) for Criteria 8. The factor applied to the Total Score is the product of all three factors.

Limited Scope Technical Investigation Decision Criteria

Limited Scope Technical Investigation Criteria	Low (1)	Med (3)	High (5)
1. Substantial Loss of Life or Disabling Injury			
A. Single or adjacent structures	0	1 to 2	>2
B. Community (city, county, metropolitan area)	0 to 3	4 to 9	>10
C. Region (state to multi-state)	0 to 5	6 to 19	>20
2. Significant Potential for Loss of Life: Exposed Population			
A. Single structure (occupancy)	<100	100 to 499	≥500
B. Community (city, county, metropolitan area)	<1 000	1 000 to 9 999	≥10 000
C. Region (state to multi-state)	<100 000	100 000 to 999 999	≥1 000 000
3. Actual Hazard			
A. Earthquake	≤ MMI IV	MMI V to VII	≥MMI VIII
B. Hurricane at Landfall	≤Cat 3	Cat 4	Cat 5
C. Tornado	≤EF3	EF4	EF5
D. Coastal Inundation	< 3 ft	3 to 9 ft	≥ 10 ft
E. Fire Spread in a Structure	Fire spread not beyond area of origin	Fire spread throughout a structure	Fire spread beyond structure of origin
F. Wildland Urban Interface (WUI)	High Forest Service Fire Danger Rating	Very High Forest Service Fire Danger Rating	Extreme Forest Service Fire Danger Rating
G. Blast	< 99 lbs. TNT-equivalent	100 - 999 lbs. TNT-equivalent	> 1000 TNT-equivalent
H. Impact	< 1×10^6 ft lb/sec	1×10^6 to 1×10^7 ft lb/sec	> 1×10^7 ft lb/sec
4. Consequences (damage and functionality)			
A. Failure during Construction ¹³	Local structural failure	Partial structural collapse	Total structural collapse
B. Engineered Building Structures	Minimal nonstructural damage	Significant nonstructural damage	Significant structural damage or collapse

¹³ Excludes construction equipment failures.

		Minimal structural damage	
C. Transportation & Utility Structures	Minimal nonstructural damage	Minimal structural damage Partial loss of function	Significant structural damage or collapse Complete loss of function
D. Non-Engineered Building Structures	Minimal nonstructural damage	Minimal structural damage	Significant structural damage or collapse
5. Need for NIST Involvement			
A. NIST Authority	Addressed by other authorities – federal, state, local – and their mission responsibility and agency expertise	Collaboration with other agencies where NIST provides complementary expertise	NIST has primary authority and/or expertise
Score: ___/___ = ___	Sum	___ x 3	___ x 5

Additional Factors

Limited Scope Technical Investigation Criteria ¹⁴	Low	Med	High
6. Stakeholder Concern¹⁵			
A. Scope and response time	Supplemental appropriation required ¹⁶	Resources available within NIST	Resources available within EL
B. Federal disaster declaration ¹⁷	N/A	Declaration; Minimal structural damage	Declaration; Significant structural damage
C. Request by other Authorities (local, state, federal)	None	NIST provides complementary expertise	NIST has primary expertise
D. Public interest	Local news	State or regional news	National news
E. Unique event with potential broad implications for similar or other types of structures	Minimal impact	Moderate impact	Significant impact
Score: ___/___ = ___	Sum	___ x 3	___ x 5

Total Score: ___/___ = ___	Total Sum	___ x 3	___ x 5
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7. Evacuation and Emergency Response¹⁸			
A. Evacuation	Normal evacuation	Moderate evacuation challenges	Significant evacuation challenges

¹⁴ Criterion 6 is only evaluated if the averaged score from Criteria 1 to 5 is between 3.0 and 4.0.

¹⁵ A directive by Congress or the Administration will result in a Limited or Extensive-Scope Technical Investigation depending on application of the relevant decision criteria and procedures.

¹⁶ The needs for a supplemental appropriation may delay ability to respond in a timely way.

¹⁷ This factor is only evaluated for events triggering use of the National Response Framework or the Stafford Act.

¹⁸ To be evaluated separately to determine if evacuation and/or emergency response members are needed on the team.

B. Emergency Response	Normal operations	Moderate operational challenges	Significant operational challenges
Sum	__ x 1	__ x 3	__ x 5

8. Potential Lessons to be Learned (for U.S. or International Events)			
A. Potential for New Knowledge ¹⁹	Why and how failure or consequences occurred known	Insufficient data	Why and how failure or consequences occurred unknown
B. Potential for Impact on Standards, Codes, and Practices	Low potential for new recommendations	Potential for new recommendations	Potential for significant new recommendations
Sum	__ x 1	__ x 3	__ x 5

Extensive Scope Technical Investigation Decision Criteria

Extensive Scope Technical Investigation Criteria	Low	Med	High
1. Need for in-depth technical study			
A. Need for in-depth technical study to determine why and how failure or consequences occurred.	Minimal	Moderate	Extensive
B. Need for in-depth technical study to develop robust recommendations for improvements to standards, codes, and practices.	Minimal	Moderate	Extensive
Sum	__ x 1	__ x 3	__ x 5

Additional Factors

2. Stakeholder Concern ²⁰			
A. Scope and response time	Supplemental appropriation required ²¹	Resources available within NIST	Resources available within EL
B. Federal disaster declaration	N/A	Declaration; Minimal structural damage	Declaration; Significant structural damage
C. Request by other Authorities (local, state, federal)	None	NIST provides complementary expertise	NIST has primary expertise
D. Public interest	Local news	State or regional news	National news
E. Unique event with potential broad implications for similar or other types of structures	Minimal impact	Moderate impact	Significant impact

¹⁹ New knowledge to be gained from disaster and failure event studies include knowledge to improve the understanding of hazards, the performance of buildings and infrastructure during disaster and failure events, the associated emergency response and evacuation procedures, and the technical, economic, and social factors that affect pre-disaster mitigation activities and post-disaster response efforts.

²⁰ A directive by Congress or the Administration will result in a Limited or Extensive-Scope Technical Investigation depending on application of the relevant decision criteria and procedures.

²¹ The needs for a supplemental appropriation may delay ability to respond in a timely way.

Score: $\frac{_}{_} = _$	Sum	$_ \times 1$	$_ \times 3$	$_ \times 5$
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Score: $\frac{_}{_} = _$	Total Sum	$_ \times 1$	$_ \times 3$	$_ \times 5$
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3. Evacuation and Emergency Response²²			
A. Evacuation	Normal evacuation	Moderate evacuation challenges	Significant evacuation challenges
B. Emergency Response	Normal operations	Moderate operational challenges	Significant operational challenges
Sum	$_ \times 1$	$_ \times 3$	$_ \times 5$

²² To be evaluated separately to determine if evacuation and/or emergency response members are needed on the team.