NFPA Technical Committee on Emergency Management and Business Continuity

August 9-11, 2011
NFPA Headquarters
1 Batterymarch Park, Quincy, MA

Meeting Agenda

1. Starting time: 8:30 a.m., August 9, 2011.
2. Welcome (Don Schmidt, Chair)
3. Self-introduction of members and guests
4. Approval of Minutes of March 21-23, 2011 Meeting in Orlando, FL
5. Approval of agenda
6. NFPA staff liaison report (Orlando Hernandez)
   - Committee membership update
   - Distribution of sign-in sheets
   - Review of NFPA 1600 cycle dates
7. U.S. TAG to ISO TC 223 Update (Dean Larson, Orlando Hernandez)
8. Organizational reports/News related to NFPA 1600
9. Task group reports
10. Review of NFPA 1600 draft
11. Public proposals
12. Committee proposals
13. Preparation of draft of NFPA 1600, 2013 edition for public comment
14. New business
15. Adjourn

Minutes

Technical Committee on
Emergency Management and Business Continuity
Pre-ROP Meeting
March 21-23, 2011, Orlando, FL

Meeting was called to order at 8:00 AM by Chair, Don Schmidt. Diane Mack agreed to serve as meeting secretary.

Attendance

Name	Office	Organization
Don Schmidt	Chair	Preparedness LLC
Orlando P. Hernandez	Staff Liaison	NFPA
Charles Adams	Principal	Medina County Emergency Management
Pete Brewster	Principal	US Dept. of Veterans Affairs
Steven Charvat	Principal	International Assoc. of Emergency Managers
Gregory Cybulski	Principal	Aon Fire Protection Engineering
Roderick Fraser	Principal	Boston Fire Department
David Gluckman	Principal	Willis
Kenneth Katz	Principal	Travelers Insurance Company
Gunnar Kuepper	Principal	Emergency and Disaster Management
Dean Larson	Principal	Purdue University Calumet
Ray Lazarus	Principal	Emergency Management Ontario
Ashley Moore	Principal	US Dept. of Homeland Security
Michael Morganti	Principal	Disaster Recovery Institute International
Melvyn Musson	Principal	Edward Jones Company
Ashley Newsome	Principal	Emergency Response Educators
Scott Nicoll	Principal	Chubb Group of Insurance Companies
David Sarabacha	Principal	Deloitte & Touche LLP
Virginia Stouffer	Principal	IDC Partners
Michael DuBose	Alternate	Willis Holding Group
Diane Mack	Alternate	Indiana University
Kelley Okolita	Alternate	Disaster Recovery Institute International
Jo Robertson	Alternate	Deloitte & Touche LLP
Brian Strong	Alternate	Association of Contingency Planners
Lloyd Bokman	Guest	CEDAR Global

Robert Vondrasek	Guest	NFPA

Members self-introduced themselves.

Minutes from last meeting – Approved. Motion by Mike Morganti; 2nd by Dean Larson.

Staff Liaison Report by Orlando Hernandez. See PowerPoint.

ISO TC 223: Dean Larson

Upcoming meetings in Berlin (May-June 2011) and China (November 2011)

ISO TC 223 Presentation by Lloyd Bokman. See PowerPoint.

Organizational Reports:

APC: Ginnie Stouffer

ACP has broadcast emails to their membership soliciting input on the 2013 edition of NFPA 1600.

ANSI: Bob Vondrasek

2 workshops this year:

- Small business 5/24/11 in DC area;
- Building resilience standards

DRI: Mike Morganti

- Added board members from Japan and China
- 3 conferences this year
- DRI's "Professional Practices for Business Continuity Practitioners" is under review in accordance with their 3 year review cycle. NFPA 1600 TC member Mike Janko is leading the effort; Don Schmidt is participating.

EMAP: Steve Charvat

- FEMA funded pilot program for assessment of Higher Education emergency management programs– 11 applications; 4 approved
- Not doing private sector pilot
- EMAP is working with the Urban Area Security Initiative (UASI) partnership

IAEM: Steve Charvat

- Experiencing growing pains due to global expansion, such as voting, membership, etc.

NEMA: No report.

ASTM: Don Schmidt

- WK 8908 (School Emergency Preparedness): Chair has resigned; new chair has not been appointed
- E2640-10 (Resource Management): No report.
- Ashley Moore reports that ASTM EOC standard is being developed.

NFPA 99: No report.

NFPA 1620: Reissued last year.

NFPA: Bob Vondrasek

- NFPA/DRII auditor training program undergoing ANSI CAP certification; expected end of Q2.
- Two-day NFPA 1600 professional development course will be taught at NFPA's annual conference in June
- Maintaining liaison with CSA (Z1600)
- First responder equipment interoperability committee
- DHS has adopted 2010 NFPA 1600
- DHS/FEMA looking for pilot for small business preparedness

Outstanding Logs: Don Schmidt

- CP1, Log 6, Log 1, Log 2, Log 3 (and 5), Log 4
- Created Log 3 Task Group to address inconsistent and confusing requirement for "plans," section 5.1, and requirements for "strategic" and "crisis management"(describe what should be included for strategic and crisis management plans). Members Dean Larson, Diane Mack, Greg Cybulski, Don Schmidt
- Created "ICS" Task Group to review the possible use of terminology "Incident Command System" in place of the generic "IMS." Task group to look at Annex A content and identify revisions. Members Jo Robertson, Dave Gluckman, Rod Fraser, Brian Strong, Steve Charvat, Diane Mack, Lee Newsome, and Matt Kowalski of Emergency Management Ontario.

Other Focus Areas: Don Schmidt. See PowerPoint.

- Task Group on "Definitions" created. Members: Kelley Okolita, Graeme Jannaway, Ginnie Stouffer, Mike Dubose, Ken Katz, and Pat Moore. Task group asked to existing terminology and identify other terms that should be defined within the standard including: "critical," "essential," "time sensitive," and "technology". The task group should also help to identify the correct terminology for "special needs." The task group should determine if use of the word "employee" is appropriate within the

standard as it relates to public sector entities that use the standard. Task group should review definition for word "capability."

- Task Group on "Recovery" created. Scott Nicoll, Kelley Okolita, Don Schmidt, Ray Lazarus, Ken Katz, and Greg Cybulski.
- Maturity Model. Much discussion on the possible development of a "maturity model" language… no vote but committee clearly did not favor such a project at this time based on significant existing workload and the likely size of such a project. Annex C revisions may address this concern at this time.

Task Group Reports:

Family Preparedness: Rod Fraser

- Presentation
- Add 6.6.3, the directive to provide family preparedness education and training for employees.
- Add of the definition of "family preparedness" and the rest the descriptive language into a NEW Annex.
- Committee decided that requiring family training was not appropriate; but rather train employees and they are responsible for their families.
- Clarify "special needs" and "employees" proper language.
- Include the web links in Annex B.2 as well as the new annex.
- Include 6.6.3. reference in Annex A, which references the new annex.

Information Technology: Dave Sarabacha

- Presentation
- Assign to definitions Task Group: critical/essential personnel
- Change "Business Impact Analysis" to "Impact Analysis."
- Define "Technology." [work with Task Group on Definitions]
- Take critical elements of what needs to be in body of standard in terms of the needs for technology, and the process that doesn't need to be in standard will go in a separate IT annex.
- Add "Technology" to 5.4.3. as a separate bullet and possibly 6.7.
- Change all instances of "business entity" to "entity."
- Include minimum required text for body of standard integrating existing BIA, 5.5 and 5.4.3.
- 5.8: Stress coordination between impact analysis and technology's ability to restore.
- Review 6.7 business continuity and recovery to stress review of recovery strategies to ensure technology availability within the recovery time objective.
- Committee did not accept adding "disaster recovery" to section 1.1.

- Need to add business continuity/Information Technology disaster recovery planning text to 7.1 (testing and exercises). [Representatives from DRII and ACP and other BCP professionals, please contribute.]

Management Systems Standard: Dean Larson

- Presentation; very little discussion.
- Draft new annex will be presented prior to or before next meeting.
- Orlando will research other standards that might have a clause that states if the annex is chosen in lieu of the standard, then the annex becomes mandatory.

Partnerships: Lloyd Bokman

- Same presentation as the Rhode Island meeting.
- Add 6.4.8. to the standard as drafted, including the four bullets.
- Orlando will research the phrase "shall allow for." Need to explain this term and where the definition or explanation should be placed (definitions or Annex A).

Annex A: Lloyd Bokman

- Presentation on progress of Annex A.
- May have to begin again, given newly-discovered NFPA restriction.
- Clean up Annex A.
- Draft a new Annex that is a "how-to guide." Don Schmidt to review the draft. After edited, NFPA will be requested to review to determine if use of text from the handbook meets with NFPA's approval.

Competencies: Pete Brewster

- Presentations by Pete Brewster and Lee Newsome
- Motion to "present proposal to NFPA for creation of new project for professional qualifications" made by Dean Larson; Ashley Moore 2nd. Discussion. Motion withdrawn by Dean Larson.
- Motion by Gunnar Kuepper: "as a committee, vote to recommend to standards council to begin project for qualifications related to NFPA 1600." 2nd by Ashley Moore. Vote: 7 in favor; 8 against. Motion not carried.
- Competencies task group to provide framework information for ROP meeting (see Pete's PPT for details).
- Ray Lazarus and Pete Brewster to objective and performance evaluation (reference to slide 7 of PPT)

Measurement: Mike DuBose

- Presentations by Mike DuBose (changes to 4, 7, 8) and Diane Mack (Annex C) [See PPT for proposed changes.]
- Little debate and some suggested edits to proposed changes to 4, 7, 8.
- Created new task group to develop a new Small Entity Guide annex.

- Send Annex C out to all committee members for comment.

Task Groups as of now, and meeting schedule for this afternoon:

- Competencies
- Family Preparedness – not meeting
- IT – not meeting
- Management System Standard
- Measurement
- Diane solo on Annex C
- Partnerships – not meeting
- Annex A
- Definitions
- Plans (Log #3)
- Recovery
- ICS
- "Small Entity" [Members: Mike Dubose, Mike Martinet, Diane Mack, Scott Nicoll, Jo Robertson, Steve Charvat, Bob Wilkerson] Members directed to review content from Metropolitan Washington Council of Government, Institute for Business and Home Safety (IBHS), and American Red Cross "Ready Rating."
- List of Hazards [Members: Don Schmidt, Mike Dubose, Dean Larson, Ken Katz] Task group members asked to provide their lists of hazards to Don Schmidt.

Breakout sessions were held from 1:00 - 4:45 PM. Break for the evening, 5:00 PM.

Wednesday, 8:00 AM: Presentation by Casey Grant, National Fire Protection Association Research Foundation.

Breakouts (8:30 – 10:00):

- Definitions
- Plans
- Small Entity

Task Group Reports

Annex A

ICS

Plans (Log 3)

- Review requirements for "plans" as requested by Log 3. Also reviewing the sequencing of requirements in Chapters 4 and 5 to align with Plan, Do, Check, Act. OK to proceed along the proposed line. Review planning process and sequence of requirements relative to "plan, do, check, act." Develop new outline for Chapter 5 to address process and outcomes. Provide clear definition of the outcomes. Risk assessment and impact analysis must be before outcomes. Move resource needs assessment (6.1.1 and 6.1.2 and selected text from chapter 6) to chapter 5.

Competencies

- Will put together definition options and circulate them

Closing Discussion

Next meeting date: In accordance with NFPA's schedule for Fall 2012 documents, the technical committee will meet for 3 days between May 23 – August 26. Chair Don Schmidt asked members to report dates that they would not be able to meet from the last week in July through the third week in August.

Adjourned at noon on 3/23/11. Morganti moved; Buck Adams seconded. Motion carried.

1600- Log #CP1 Final Action:
(Entire Document)

Submitter: Technical Committee on Emergency Management and Business Continuity,
Recommendation: Review entire document to: 1) Update any extracted material by preparing separate proposals to do so, and 2) review and update references to other organizations documents, by preparing proposal(s) as required.
Substantiation: To conform to the NFPA Regulations Governing Committee Projects.

1600- Log #6 Final Action:
(Entire Document)

Submitter: James Stoddard, IBM
Recommendation: 1) I did not see anything in the standard stating the frequency/cycle for updating and testing the plans/procedures. Chapter 7.4 attempts to address this but if you leave that open ended, you may never have a reasonably up-to-date plan. My recommendation is to set that frequency/cycle to an annual basis.
2) I did not see anything in the standard that states where to store the plans/procedures. My recommendation is to ensure a copy of the plans are stored in a remote location. This will help ensure the plan owner/recovery team has access to the document(s) should the original(s) be destroyed in a disaster event.
Substantiation: 1) Have a reasonably up-to-date plan.
2) Help ensure the plan owner/recovery team has access to the document(s) should the original(s) be destroyed in a disaster event.

1600- Log #19 Final Action:
(1.x (New))

Submitter: Kenneth Katz, Travelers Insurance Company
Recommendation: Add new text to read as follows;
1.x* Annex (letter to be determined – MSS Annex) is intended to be adopted by the entity at its discretion, replacing Chapters 1 – 8. Although this annex is written in mandatory language, it is not intended to be enforced or applied unless specifically adopted by the entity, thereby replacing Chapters 1 – 8 and becoming the full requirements of the standard.
*MSS Annex 1.x Information in this annex is intended to be adopted by the entity at its discretion. Although this annex is written in mandatory language, it is not intended to be enforced or applied unless specifically adopted by the entity.
Substantiation: Proposis needed to support the use of the voluntary MSS Annex.ed wording

1600- Log #21 Final Action:
(1.3)

Submitter: Dean R. Larson, Purdue University Calumet
Recommendation: Delete text to read as follows:
1.3* Application.
This document shall apply to public, not-for-profit, non-governmental organizations (NGO), and private entities ~~on a local, regional, national, international, and global basis~~
Substantiation: The intent of the application is clear without the modifying phrase.

1600- Log #20 Final Action:
(Chapter 3 APELL (Awareness and Preparedness for Emergencies at the Local Level))

Submitter: Dean R. Larson, Purdue University Calumet
Recommendation: Add new text to read as follows:

APELL (Awareness and Preparedness for Emergencies at the Local Level) consists of a series of programs developed in 1988 under the leadership of the United Nations Environmental Programme (UNEP) with the cooperation of multiple organizations, including the U.S. EPA, in response to the tragic accident in Bhopal, India. APELL is a multi-stakeholder dialogue tool that establishes adequate coordination and communication in situations where the public might be affected by accidents and disasters.

APELL process implementation consists of ten steps:

Step ONE - Identify the emergency response participants and establish their roles, resources and their concerns,

Step TWO - Evaluate the hazards and risks that may result in emergency situations in the community,

Step THREE - Have participants review their own emergency response plans for adequacy relative to a co-ordinated response

Step FOUR - Identify the required response tasks not covered by existing plans

Step FIVE - Match the Step 4 tasks to the resources available from the identified participants

Step SIX - Make changes necessary to improve existing plans and integrate existing plans into an overall community plan and gain agreement

Step SEVEN - Commit an integrated community plan to writing and get approvals from the local government

Step EIGHT - Educate participating groups about the integrated plan and ensure that all responders are trained

Step NINE - Establish procedures for periodic testing, review and updating of the plan

Step TEN - Educate the general community on the integrated emergency response plan

The APELL process informs the community about the risks they are exposed to and educates the community on how to react to accidents/disasters. The program promotes the coordination between representatives from the industry, the local level institutions and the public. The APELL process included the preparation of an integrated community preparedness plan, including preparing the community for early warnings of emergencies.

The APELL program for technological hazards was implemented over ten years ago in Bahía Blanca, Argentina a city located in the south east of the province of Buenos Aires, Argentina, by the Atlantic Ocean. It has a population of over 300,000 inhabitants. The city has an important sea port with a depth of 40 feet (12 m), kept constant upstream almost all along the length of the bay, where the Naposta Stream drains. *Bahía Blanca* means "White Bay". The name is due to the typical color of the salt covering the soils surrounding the shores.

The need for the APELL program in Bahia Blanca is reinforced when reviewing the number and amounts of hazardous chemicals produced each year. The industrial complex is made up of three types of industry: Petroleum Industry with an installed capacity of 4 million tons a year producing ethanol, petrol, naphtha, GLP, fuel oil, gas oil, gasoline, asphalt, kerosene; Petrochemical Industry installed capacity of 3.4 million tons a year with ethylene, VCM, PVC, polyethylene, urea, pure ammonia as products; and, Chemical Industry installed capacity of 350 thousand tons a year producing chlorine, caustic soda.

Led by Ing. Nestor Sposito, of Dow Chemical in Bahia Blanca and a member of the NFPA Capitulo Argentina, the APELL program for technological hazards as been successfully used to implement NFPA 1600 *Standard on Disaster/Emergency Management and Business Continuity Programs*, a standard developed to define a program for the integration of Emergency Management and Business Continuity, applicable to the private, public, and not-for-profit sectors. The community support for the project has been excellent led the mayor of Bahia Blanca establishing the goal for his city to be the first in the world to implement NFPA 1600. Due to the success of combining APELL with NFPA 1600 in Argentina, a recent conference held with representatives of chemicals companies in Zhanjiagang, China included presentations on the Bahia Blanca project and on NFPA 1600.

IRAM, the national standards body of Argentina, issued IRAM/NFPA 1600 as their national standard, the result of nearly three years of cooperative effort between NFPA volunteers in both Argentina and the United States including working with the APELL process in Bahia Blanca.

Other APELL programs have been produced for mining, port areas, multi-hazards, transportation, and tourism and are available at http://www.unep.fr/scp/sp/.

Substantiation: In response to the Bhopal incident, under the leadership of the United Nations Environmental Programme [correct spelling] (UNEP), a group representing various, including the U.S. Environmental Protection Agency, the APELL (Awareness and Preparedness for Emergencies at the Local Level) for Technological hazards. Additional APELL programs for mining, port areas, multi-hazards, transportation, and tourism have been developed.

In 2010, NFPA signed a MOU with UNEP to share various NFPA programs including NFPA 1600. APELL programs are a current "tool" for implementation of NFPA 1600 and should be covered in annex material for the 2013 Edition.
This is not original material; its reference/source is as follows:
ISO/TC 22393 Committee Draft (CD) Societal security – Guidelines for exercises and testing.

1600- Log #16 Final Action:
(Chapter 3 Competence)

Submitter: Dean R. Larson, Purdue University Calumet
Recommendation: Add new definition to read as follows:
Competence. Demonstrated ability to apply knowledge and skills to achieve intended results.
Substantiation: With the renewed emphasis on competencies, it is prudent to clearly define the base term "competence." Merriam-Webster Dictionary definition is not appropriate. Other definitions for competence, competencies and core competencies lack the required demonstrated ability of knowledge and skills. A person may have the knowledge and skills based on education/training but not be able to properly demonstrate the ability to properly use. The proposed definition is in the past tense meaning that the person or organization has been evaluated against criteria that insure proper and timely application.
Other definitions:
Competence. Cluster of related abilities, commitments, knowledge, and skills that enable a person (or an organization) to act effectively in a job or situation. In comparison to 'competency' (plural competencies) which refers to a cluster of abilities relating to excellence in a specific activity, competence indicates sufficiency (state of being 'good enough') of knowledge and skills that enable one to act in a wide variety of situations. Because each level of responsibility has its own requirements, competence can occur in any period of a person's life or at any stage of his or her career. http://www.businessdictionary.com/definition/competence.html
Competencies are the measurable or observable knowledge, skills, abilities, and behaviors (KSABs) critical to successful job performance. Choosing the right competencies allows employers to:
- *Plan how they will organize and develop their workforce.*
- *Determine which job classes best fit their business needs.*
- *Recruit and select the best employees.*
- *Manage and train employees effectively.*
- *Develop staff to fill future vacancies. Washington State Department of Personnel*

Core competency - A core competency is fundamental knowledge, ability, or expertise in a specific subject area or skill set. http://searchcio-midmarket.techtarget.com/definition/core-competency
The proposed text comes from ISO/TC 22393 Committee Draft (CD) Societal security – Guidelines for exercises and testing.
This is not original material; its reference/source is as follows:
ISO/TC 22393 Committee Draft (CD) Societal security – Guidelines for exercises and testing.

1600- Log #26 Final Action:
(3.3.x Testing (New))

Submitter: Dean R. Larson, Purdue University Calumet
Recommendation: Add new text to read as follows:
3.3.x* Testing. Procedure for evaluation; a means of determining the presence, quality, or veracity of something
Substantiation: Chapter 7 is entitled "Testing and Exercises." A clarifying definition is needed to support the standard.
This is not original material; its reference/source is as follows:
ISO/TC 22398 Societal security.

1600- Log #24 Final Action:
(3.3.9 Exercise)

Submitter: Dean R. Larson, Purdue University Calumet
Recommendation: Revise text to read as follows:
~~3.3.9* Exercise. Activity in which the entity's plan(s) is rehearsed in part or in whole to ensure that the plan(s) contains the appropriate information and produces the desired result when put into effect.~~
3.3.9* Exercise. A process to assess, train for, practice, and improve performance in an organization
Substantiation: The recommended revised definition enhances the definition with additional characteristics.
This is not original material; its reference/source is as follows:
ISO/TC 22398 Societal security - Standard for exercises and testing.

1600- Log #8 Final Action:
(4.4(7) (New))

Submitter: Kenneth Katz, Travelers Insurance Company
Recommendation: Revise text to read as follows:
4.4 Program Administration – add new paragraph
Chapter 4.4 (7)
The entity shall develop and implement a process for managing change.
Substantiation: Managing change is essential to maintaining an effective program.

1600- Log #1 Final Action:
(4.5.5 (New))

Note: This proposal appeared as Comment 1600-70 (Log #40) which was held from the Fall 2009 ROC on Proposal 1600-2.
Submitter: Michael W. Janko,
Recommendation: Add 4.5.5 to read as follows:
The entity shall develop a maturity model for self assessment of goals and objectives in establishing short and long term performance. The maturity model should be scalable and be recognized as a metric in quantifying the program's ability to cascade throughout the organization.
Substantiation: The term "maturity model" is being utilized by private sector organizations and others who have interest in establishing a meaningful program that shows long term program commitment. This would include a self assessment across all business lines, tactical teams and support functions.

1600- Log #39 Final Action:
(4.6.x (New))

Submitter: Michael A. Anthony, University of Michigan
Recommendation: Add text to read as follows:

4.6.+ Qualifications and Accreditation.

4.6.++ The entity, or the expert agency retained by the entity to prepare the product described in this document, shall demonstrate proficiency in Monte Carlo modeling and simulation of disaster and recovery scenarios.

4.6.+++ The criterion for demonstrating proficiency in Monte-Carlo modeling and simulation shall be determined by the Authority Having Jurisdiction

Substantiation: When its objectives are fully realized, this document will create a cadre of expert agencies to meet market demand for Disaster/Emergency Management and Business Continuity Programs. We need to have a discussion about -- and an enforceable requirement for -- the qualifications of the expert agencies producing this deliverable.

Monte Carlo methods are especially useful for modeling phenomena with significant uncertainty in inputs, such as the calculation of risk in business, the likelihood of hazards or combinations of hazards. When Monte Carlo simulations have been applied in space exploration and oil exploration, their predictions of failures, cost overruns and schedule overruns are routinely better than human intuition or alternative "soft" methods.

Since Section 4.7 of this document states,

…"There shall be a responsive financial management and administrative framework that complies with the entity's program requirements and is uniquely linked to response, continuity, and recovery operations."…

qualitative considerations described in this document should be informed by quantitative modeling. Monte Carlo methods in finance are often used to evaluate investments in projects such as the suite of mitigation measures described in this document. Such methods can be used to model project schedules, where simulations aggregate estimates for worst-case, best-case, and most likely durations for each task to determine outcomes for the overall project. Mastery of Monte-Carlo methods should be regarded as distinctive a measure of competence as trade union membership or professional engineering licensure.

1600- Log #42 Final Action:
(4.6.x (New))

Submitter: Robert Schuerger, HP Critical Facilities Services
Recommendation: Add text to read as follows:

4.6.+ The performance objective shall include the use of a gradient scale in the determining how critical the individual infrastructure elements are to both responding/recovering from the event and also in mitigating further escalation of the damages:

Category I – Systems that have been designated to remain operational or be immediately restorable to service after the event for emergency services to function or to prevent significant escalation of the damages.

Category II – Systems that have been designated to significantly contribute to the delivery of emergency services or are essential for disaster recovery or to prevent significant escalation of the damages. Category II systems are typically restorable to operation within 4 hours.

Category III – Systems that have significant impact on the protection of life and property, but are not immediately essential for providing emergency services or to prevent significant escalation of the damages. Category III systems are typically restorable to operation within 24 hours.

Category IV – Critical systems that have significant impact on the protection of life and property, but are not immediately essential, as there are multiple systems or facilities providing the same function. Category IV systems are typically restorable to operation within 24 hours for the time utility power, water and sewage disposal are available to the facility.

Substantiation: Major disasters, such as floods from hurricanes and earth quakes significantly disrupt normal transportation and communication lines. Relief efforts are stopped before they can get started if there is no way for them to find out where the relief is needed and how to get to the area.

Major disasters also significantly disrupt normal services, such as electrical power, natural gas, water and sewage service. How quickly relief is required before the situation becomes life threatening to the general population varies significantly due to the circumstances. In all cases the loss of water and sewage will significantly impact the general public in a matter of a few days. Health related issues due to water contamination can escalate much quicker.

For example, take the health risks due to loss of sewage pumping station. For the most part, sewage systems or pump stations are generally in the lowest surrounding area. Typically pumping stations don't have a holding pond available. The sewer enters a wet well located at the pumping station and how much storage the wet well and incoming sewer have determines how long the pumping station can be out of service before it begins to back up into basements or overflow out of manholes. At high flows for larger pumping stations, this is generally not a huge amount of time (in some cases this may be between 15 minutes to half an hour). Backups and overflows are both health and environmental issues.

Wastewater that backs up in basements can cause significant damage to homes and is generally a significant health concern for the residents. Cleanup includes throwing away anything that cannot be safely cleaned up and disinfected. Cleanup requires proper personal protection and care in dealing with raw sewage. If the backup were to a business, the amount of damage or problems that can occur would obviously depend upon the extent of the backup (how much and how long), what kind of equipment, storage, or other use the business makes of its lower level(s), how the backup may affect the health and well being of employees and customers, and how it affects the general operation of the business itself.

Wastewater that is released into the environment can cause environmental damage, e.g., fish kills and algae blooms, and can be a significant health hazard, e.g., high levels of pathogens in swimming areas or incidental contact with raw sewage near areas of the spill.

Therefore hardening the key pieces of the infrastructure (such as 911 Call Centers) that are required for recovery from the event or to mitigate significant escalation of the damages should be specifically addressed as part of the Prevention strategy. The essential infrastructure elements should be given a priority ranking, so the most critical elements receive the most resources.

This is the joint work of Robert Schuerger, Michael Simon and Robert Arno.

1600- Log #44 Final Action:
(4.6.x (New))

Submitter: Robert G. Arno, EYP Mission Critical Facilities, Inc.
Recommendation: Add text to read as follows:

4.6.+ Risk Assessment/Vulnerability

4.6.++ The performance objectives shall utilize statistical methods to determine the vulnerability of systems or subsystems during potential natural disaster periods utilizing existing information to determine the probability of occurrences.

4.6.+++ Suggested methodologies utilizing existing information determining the probability of occurrences

Substantiation: What is the likely hood that a facilities infrastructure will be operational during critical vulnerability periods such as peak hurricane season? Applying Reliability statistical methodologies to determine the failure distribution of critical components will provide for a manageable decision process identifying the components is a system needing the most attention. This is especially useful in determining the risk of failure during natural disaster events. Utilizing known documents such as the IEEE STD 493 (Gold Book) and the US Army Corps of Engineers, Power Reliability Enhancement Program Database a statistical approach to vulnerability can be determined.

The need for comprehensive information supporting the decision process is critical to achieving accurate assessments. The two identified sources of information are the most comprehensive in the world representing years of data collection and statistical assessment supporting facility infrastructure. The existence of these data sources allows the use of comprehensive statistical analysis techniques provide for more accurate determination of levels of vulnerability of an infrastructure.

1600- Log #9 Final Action:
(4.6.2)

Submitter: Jo Robertson, Falls Church, VA
Recommendation: Revise text to read as follows:

4.6.2 The performance objectives shall ~~depend on~~ consider the results of the hazard identification, risk assessment, and business impact analysis.

Substantiation: The current wording is too prescriptive and the suggested wording is meant to bring this more in line with the intention of the standard.

Just because the organization's assessment indicates a meteor would be a high consequence hazard, doesn't mean the organization should put a lot of money into mitigating against the possibility of that happening. Certainly high consequence impacts should be considered, but management should have some leeway in determining the best direction to go based on judgement, cost-benefit analysis, and other unnamed factors. Hazard identification, risk assessment, BIA, etc. should be used as tools not as laws that must be abided by.

1600- Log #10 Final Action:
(4.7.3)

Submitter: Jo Robertson, Falls Church, VA
Recommendation: Revise text to read as follows:
4.7.3 There shall be crisis management procedures to provide coordinated ~~situation-specific~~ authorization levels and appropriate control measures.

Substantiation: The current wording is too prescriptive and the suggested wording is meant to bring this more in line with the intention of the standard.
For example, the current wording seems to indicate that Finance must be authorized to spend only within a certain range if the organization is hit by a hurricane and within a different range if the disaster is an earthquake. But what if the situation is a large fire rather than a small fire? What if flooding necessitates the expenditure of money but flooding hasn't been itemized as among the disasters which Finance is authorized to expend money on?
What if a better means of stipulating authorization levels is to identify that _____, _____, and _____ are pre-authorized to spend up to $_____ on disaster response and if anticipated costs are likely to be higher the process for authorizing additional expenditures is _____. (?)
Bottom line, the organization should be allowed to determine the authorization levels that best fit, rather than be strapped to situation-specific authorization levels.

1600- Log #2 Final Action:
(5.2.5 and 5.2.6)

Note: This proposal appeared as Comment 1600-100 (Log #69) which was held from the Fall 2009 ROC on Proposal 1600-2.
Submitter: Janusz Wasiolek, Rockville, MD
Recommendation: Revise text to read as follows:
5.2.5* The entity shall conduct a business impact analysis (BIA) or community impact analysis.
5.2.5.1 The BIA or community impact analysis shall be based on significant hazards (risk based) and the interruption or disruption of individual functions and applications (functional based).
5.2.5.2 The BIA or community impact analysis shall evaluate the impact of functional failure to the entity as a whole.
5.2.6 The BIA or community impact analysis developed in 5.2.5 shall be used in the development of continuity plans.

Substantiation: The section as its written seems to apply primarily to businesses. Since the goals of government during a disaster are different than that of a business (i.e. protect the community served vs. maximize profit and/or protect employees), a true business impact analysis may not be appropriate for government entities. Therefore, a community impact analysis which evaluates how the community served by the government may be impacted by an incident would be more appropriate considering the greater external goals and objectives of government.

1600- Log #43 Final Action:
(5.2.6.x (New))

Submitter: Michael A. Anthony, University of Michigan / Rep. APPA.ORG - Leadership in Education
Recommendation: Add text to read as follows:

5.2 Common Plan Requirements.

5.2.1* Plans shall identify the functional roles and responsibilities of internal and external agencies, organizations, departments, and positions.

5.2.2 Plans shall identify lines of authority.

5.2.3 Plans shall identify lines of succession for the entity.

5.2.4 Plans shall identify interfaces to external organizations.

5.2.5 Plans shall identify the process for delegation of authority.

5.2.6 Plans shall identify logistics support and resource requirements.

5.2.6+ Plans shall identify critical operations power systems

5.2.7* Plans shall address the health and safety of personnel.

5.2.8* Plans shall be individual, integrated into a single plan document, or a combination of the two.

5.2.9* The entity shall make sections of the plans available to those assigned specific tasks and responsibilities therein and to key stakeholders as required.

Substantiation: A requirement of this nature will strengthen NFPA 1600 and Article 708 of the National Electrical Code and will provide a crosswalk for the specifics that this document needs.

For the convenience of the committee, some of the introductory material of Article 708 is reproduced below:

I. General708.1 Scope. The provisions of this article apply to the installation, operation, monitoring, control, and maintenance of the portions of the premises wiring system intended to supply, distribute, and control electricity to designated critical operations areas (DCOA) in the event of disruption to elements of the normal system.

Critical operations power systems are those systems so classed by municipal, state, federal, or other codes by any governmental agency having jurisdiction or by facility engineering documentation establishing the necessity for such a system. These systems include but are not limited to power systems, HVAC, fire alarm, security, communications, and signaling for designated critical operations areas.

Informational Note No. 1: Critical operations power systems are generally installed in vital infrastructure facilities that, if destroyed or incapacitated, would disrupt national security, the economy, public health or safety; and where enhanced electrical infrastructure for continuity of operation has been deemed necessary by governmental authority.

Informational Note No. 2: For further information on disaster and emergency management see *NFPA 1600*-2010, *Standard on Disaster/Emergency Management and Business Continuity Programs*.

Informational Note No. 3: For further information regarding performance of emergency and standby power systems, see NFPA 110-2010, *Standard for Emergency and Standby Power Systems*.

Informational Note No. 4: For further information regarding performance and maintenance of emergency systems in health care facilities, see NFPA 99-2005, *Standard for Health Care Facilities*.

Informational Note No. 5: For specification of locations where emergency lighting is considered essential to life safety, see NFPA *101*-2009, *Life Safety Code*.

Informational Note No. 6: For further information on regarding physical security, see NFPA 730-2008, *Guide for Premises Security*.

Informational Note No. 7: Threats to facilities that may require transfer of operation to the critical systems include both naturally occurring hazards and human-caused events. See also A.5.3.2 of *NFPA 1600*-2010.

Informational Note No. 8: See Informative Annex F, Availability and Reliability for Critical Operations Power Systems; and Development and Implementation of Functional Performance Tests (FPTs) for Critical Operations Power Systems.

Informational Note No. 9: See Informative Annex G, Supervisory Control and Data Acquisition (SCADA).

1600- Log #40 Final Action:
(5.2.7.x (New))

Submitter: Michael A. Anthony, University of Michigan
Recommendation: Add text to read as follows:
5.2.1* Plans shall identify the functional roles and responsibilities of internal and external agencies, organizations, departments, and positions
5.2.2 Plans shall identify lines of authority.
5.2.3 Plans shall identify lines of succession for the entity.
5.2.4 Plans shall identify interfaces to external organizations.
5.2.5 Plans shall identify the process for delegation of authority.
5.2.6 Plans shall identify logistics support and resource requirements.
5.2.7* Plans shall address the health and safety of personnel.
5.2.7+* Plans shall provide for the survivability of a 30-day electrical power outage.
5.2.8* Plans shall be individual, integrated into a single plan document, or a combination of the two.
5.2.9* The entity shall make sections of the plans available to those assigned specific tasks and responsibilities therein and to key stakeholders as required.
Substantiation: The mandatory sections of this document need more specifics to get it to the next leg of acceptance and adoption.
This proposal is intended to assert an all-discipline benchmark for a community served by a typical emergency management district when utility power is not available at the transmission level for any reason. This condition permits limited use of the distribution system -- the "last mile" for example -- to be used for feeding (and backfeeding) loads on a basis limited by duration and quantity of power. Just as civil engineers benchmark their infrastructure design around 10-, 25-, and 100-year floods, emergency management professionals and power engineers should have a conversation about the range of options for survivability of a 30 day power outage.
Electrical infrastructure is the "infrastructure of infrastructures" in the US economy. It is important to think about the unthinkable. A program for the survivability of a 30-day power outage may not necessarily mean an extremely large expenditure in infrastructure if the 30-day benchmark starts with blocks of survivability concepts from the bottom up. Some of the features of a 30-day plan might include the following:
A. Residential -
1. Assisting homeowners in the purchase and safe operation of small residential generators and fuel storage.
2. Education and assistance in the safe use of DC-AC inverters that use automobiles as a prime mover for providing limited power to individual homes.
3. Providing finance programs or engineering approaches in which small generators may be safely shared by two or more homeowners.
4. Encourage the purchase of small communication equipment with alternative energy charging systems.
5. Use of recreational vehicles as standby domiciles.
6. Generally optimizing the prospect that our personal or commercial transportation system can safely morph into a backup power system.
B. Commercial -
7. Encourage gasoline filling stations, pharmacies and grocery stores to have on-site generation facilities -- possibly shared among them across differing ownership regimes -- for the purpose of providing limited business continuity and community survivability.
8. Encourage apartment complexes to re-configure utility service equipment with appropriate manual transfer switchgear so that large groups of residents can have limited power from privately owned rolling generation and fuel supplies.
9. Measure total fuel reserves in the emergency management district (including all filling stations) and reconfigure the fuel supply chain and/or purchasing aggregations -- especially with respect to health care and municipal service facility priorities.
10. Creation of shared, community battery charging stations for residential use.
11. Adding more municipally owned mobile generators that can be used to inject power into public facilities, for public use, for 4-8 hours
12. Encourage power-take-off equipment in trucks and heavy vehicles that can be moved to stationary generation equipment.
C. Industrial -
13. Small hydro, hydro-storage, or biomass plants in the range of 100-500 kW may be identified as a component in a

municipal critical operations power system and thereby deploy balance sheet offsets that get them to the financial break-even point.
14. Expansion of municipal biomass, hydro-storage, and wind power storage systems to release fuel for standby power for residential use.
15. Public service commission support for utility inter-ties identified as having a significant homeland security component.
16. Public service commission granting utilities compensation for identifying circuit locations where mobile sources of power may be injected onto the last mile of the distribution grid in 1-2 megawatt chunks.
17. The creation of, or support for small district energy systems with a critical operations power system component.
This is only a brief list of possibilities. It may be found that simple administrative measures such as knowing where power injection points may be, or how much fuel is available in the emergency management district at any given time may result in significant gains in meeting the 30-day benchmark. In any case, the concept presented here should add new dimensions to homeland security discussions and charge the next edition of NFPA 1600 with more specifics.

1600- Log #31 Final Action:
(5.4.5 (New))

Submitter: Robert Schuerger, HP Critical Facilities Services
Recommendation: Add new text to read as follows:
5.4.5 The risk assessment shall include an analysis of the essential infrastructure elements required to respond/recover from the event or prevent significant escalation of the damages and the impact on the response/recovery/damages if the operational time is not met.
Substantiation: Major disasters, such as floods from hurricanes and earth quakes significantly disrupt normal transportation and communication lines. Relief efforts are stopped before they can get started if there is no way for them to find out where the relief is needed and how to get to the area.
Major disasters also significantly disrupt normal services, such as electrical power, natural gas, water and sewage service. How quickly relief is required before the situation becomes life threatening to the general population varies significantly due to the circumstances. In all cases the loss of water and sewage will significantly impact the general public in a matter of a few days. Health related issues due to water contamination can escalate much quicker.
For example, take the health risks due to loss of sewage pumping station. For the most part, sewage systems or pump stations are generally in the lowest surrounding area. Typically pumping stations don't have a holding pond available. The sewer enters a wet well located at the pumping station and how much storage the wet well and incoming sewer have determines how long the pumping station can be out of service before it begins to back up into basements or overflow out of manholes. At high flows for larger pumping stations, this is generally not a huge amount of time (in some cases this may be between 15 minutes to half an hour). Backups and overflows are both health and environmental issues.
Wastewater that backs up in basements can cause significant damage to homes and is generally a significant health concern for the residents. Cleanup includes throwing away anything that cannot be safely cleaned up and disinfected. Cleanup requires proper personal protection and care in dealing with raw sewage. If the backup were to a business, the amount of damage or problems that can occur would obviously depend upon the extent of the backup (how much and how long), what kind of equipment, storage, or other use the business makes of its lower level(s), how the backup may affect the health and well being of employees and customers, and how it affects the general operation of the business itself.
Wastewater that is released into the environment can cause environmental damage, e.g., fish kills and algae blooms, and can be a significant health hazard, e.g., high levels of pathogens in swimming areas or incidental contact with raw sewage near areas of the spill.
This is the joint work of Robert Schuerger, Michael Simon and Robert Arno.

1600- Log #32 Final Action:
(5.4.6 (New) and 5.5.3)

Submitter: Robert Schuerger, HP Critical Facilities Services
Recommendation: Add text to read as follows:

5.4.6 The risk assessment shall include an analysis of the risk and severity escalation over time, showing key milestones for response/recovery to be accomplished by and the risk/severity escalation that would occur if the response/recovery time is not met.

5.5.3* The BIA shall identify those functions, processes, and applications that are critical to the entity and the point in time when the impact(s) of the interruption or disruption becomes unacceptable to the entity. The BIA shall also evaluate to what extent the severity escalates over time until the critical functions, processes, and applications are restored to operation.

Substantiation: Major disasters, such as floods from hurricanes and earth quakes significantly disrupt normal transportation and communication lines. Relief efforts are stopped before they can get started if there is no way for them to find out where the relief is needed and how to get to the area.

Major disasters also significantly disrupt normal services, such as electrical power, natural gas, water and sewage service. How quickly relief is required before the situation becomes life threatening to the general population varies significantly due to the circumstances. In all cases the loss of water and sewage will significantly impact the general public in a matter of a few days. Health related issues due to water contamination can escalate much quicker.

For example, take the health risks due to loss of sewage pumping station. For the most part, sewage systems or pump stations are generally in the lowest surrounding area. Typically pumping stations don't have a holding pond available. The sewer enters a wet well located at the pumping station and how much storage the wet well and incoming sewer have determines how long the pumping station can be out of service before it begins to back up into basements or overflow out of manholes. At high flows for larger pumping stations, this is generally not a huge amount of time (in some cases this may be between 15 minutes to half an hour). Backups and overflows are both health and environmental issues.

Wastewater that backs up in basements can cause significant damage to homes and is generally a significant health concern for the residents. Cleanup includes throwing away anything that cannot be safely cleaned up and disinfected. Cleanup requires proper personal protection and care in dealing with raw sewage. If the backup were to a business, the amount of damage or problems that can occur would obviously depend upon the extent of the backup (how much and how long), what kind of equipment, storage, or other use the business makes of its lower level(s), how the backup may affect the health and well being of employees and customers, and how it affects the general operation of the business itself.

Wastewater that is released into the environment can cause environmental damage, e.g., fish kills and algae blooms, and can be a significant health hazard, e.g., high levels of pathogens in swimming areas or incidental contact with raw sewage near areas of the spill.

This is the joint work of Robert Schuerger, Michael Simon and Robert Arno.

1600- Log #36 Final Action:
(5.4.7 (New))

Submitter: Robert Schuerger, HP Critical Facilities Services
Recommendation: Add new text to read as follows:

5.4.7 The Risk Assessment shall include an analysis of how critical the individual systems or infrastructure elements are in comparison to each other with recommendations as to which of the following categories each system or element should be assigned to.

Category I – Systems that have been designated to remain operational or be immediately restorable to service after the event for emergency services to function or to prevent significant escalation of the damages.

Category II – Systems that have been designated to significantly contribute to the delivery of emergency services or are essential for disaster recovery or to prevent significant escalation of the damages. Category II systems are typically restorable to operation within 4 hours.

Category III – Systems that have significant impact on the protection of life and property, but are not immediately essential for providing emergency services or to prevent significant escalation of the damages. Category III systems are typically restorable to operation within 24 hours.

Category IV – Critical systems that have significant impact on the protection of life and property, but are not immediately essential, as there are multiple systems or facilities providing the same function. Category IV systems are typically restorable to operation within 24 hours for the time utility power, water and sewage disposal are available to the facility.

Substantiation: Major disasters, such as floods from hurricanes and earth quakes significantly disrupt normal transportation and communication lines. Relief efforts are stopped before they can get started if there is no way for them to find out where the relief is needed and how to get to the area.

Major disasters also significantly disrupt normal services, such as electrical power, natural gas, water and sewage service. How quickly relief is required before the situation becomes life threatening to the general population varies significantly due to the circumstances. In all cases the loss of water and sewage will significantly impact the general public in a matter of a few days. Health related issues due to water contamination can escalate much quicker.

For example, take the health risks due to loss of sewage pumping station. For the most part, sewage systems or pump stations are generally in the lowest surrounding area. Typically pumping stations don't have a holding pond available. The sewer enters a wet well located at the pumping station and how much storage the wet well and incoming sewer have determines how long the pumping station can be out of service before it begins to back up into basements or overflow out of manholes. At high flows for larger pumping stations, this is generally not a huge amount of time (in some cases this may be between 15 minutes to half an hour). Backups and overflows are both health and environmental issues.

Wastewater that backs up in basements can cause significant damage to homes and is generally a significant health concern for the residents. Cleanup includes throwing away anything that cannot be safely cleaned up and disinfected. Cleanup requires proper personal protection and care in dealing with raw sewage. If the backup were to a business, the amount of damage or problems that can occur would obviously depend upon the extent of the backup (how much and how long), what kind of equipment, storage, or other use the business makes of its lower level(s), how the backup may affect the health and well being of employees and customers, and how it affects the general operation of the business itself.

Wastewater that is released into the environment can cause environmental damage, e.g., fish kills and algae blooms, and can be a significant health hazard, e.g., high levels of pathogens in swimming areas or incidental contact with raw sewage near areas of the spill.

The requirement for the various types of critical systems needs to align with the importance of the system to the protection of life and property. A set of specific requirements for the various levels of criticality needs to be included in the article to provide direction, adequate design criteria and for consistent application.

The classifying governmental agency having jurisdiction would benefit from consistent guidelines to be use in determining which systems in their jurisdiction should be addressed. A gradient level of criticality provides a method to ensure the most critical systems have the resources allocated to them so that they are available when needed to deliver emergency services and provide for disaster recovery. It also provides the sequence in which to make incremental improvements most effectively.

This is the joint work of Robert Schuerger, Michael Simon and Robert Arno.

1600- Log #3 Final Action:
(5.5.1)

Note: This proposal appeared as Comment 1600-108 (Log #76) which was held from the Fall 2009 ROC on Proposal 1600-2.
Submitter: Ronald Holten, Chevron Corp.
Recommendation: Restructure the standard to more clearly describe the plans an entity is expected to have.

Substantiation: The standard is very loose in its descriptions of the types of plans that are needed, what they should contain, and how they should be physically presented. Section 5.5.1 suggests the need for the following plans:

- Strategic
- Crisis management
- Prevention
- Mitigation
- Emergency operations/Response
- Continuity
- Recovery

Upon researching the entire standard, something is indeed said about each of these plans. But these descriptions are widely spread and they vary in format and level of detail. It would be far better to have one chapter that specifically describes the exceptions for each type of plan.

Also, entities will present these plans in different ways due to different organizational and regulatory histories and other factors. For example, the industry I operate in tends to merge prevention and mitigation into one plan, continuity and recovery in another. Crisis management usually stands alone. Emergency response also stands alone. Strategic planning concepts are built into all of these plans individually rather than being presented in a separate plan. The standard should expand on Section 5.6.8 to clarify that flexibility like this exists.

1600- Log #33 Final Action:
(5.6.5 (New))

Submitter: Robert Schuerger, HP Critical Facilities Services
Recommendation: Add new text to read as follows:

5.6.5 The prevention strategy shall include analysis of the essential infrastructure elements required to respond/recover from the event or prevent significant escalation of the damages and the hardening of these elements to increase the probability they will be operational or quickly restored after the event.

Substantiation: Major disasters, such as floods from hurricanes and earth quakes significantly disrupt normal transportation and communication lines. Relief efforts are stopped before they can get started if there is no way for them to find out where the relief is needed and how to get to the area.

Major disasters also significantly disrupt normal services, such as electrical power, natural gas, water and sewage service. How quickly relief is required before the situation becomes life threatening to the general population varies significantly due to the circumstances. In all cases the loss of water and sewage will significantly impact the general public in a matter of a few days. Health related issues due to water contamination can escalate much quicker.

For example, take the health risks due to loss of sewage pumping station. For the most part, sewage systems or pump stations are generally in the lowest surrounding area. Typically pumping stations don't have a holding pond available. The sewer enters a wet well located at the pumping station and how much storage the wet well and incoming sewer have determines how long the pumping station can be out of service before it begins to back up into basements or overflow out of manholes. At high flows for larger pumping stations, this is generally not a huge amount of time (in some cases this may be between 15 minutes to half an hour). Backups and overflows are both health and environmental issues.

Wastewater that backs up in basements can cause significant damage to homes and is generally a significant health concern for the residents. Cleanup includes throwing away anything that cannot be safely cleaned up and disinfected. Cleanup requires proper personal protection and care in dealing with raw sewage. If the backup were to a business, the amount of damage or problems that can occur would obviously depend upon the extent of the backup (how much and how long), what kind of equipment, storage, or other use the business makes of its lower level(s), how the backup may affect the health and well being of employees and customers, and how it affects the general operation of the business itself.

Wastewater that is released into the environment can cause environmental damage, e.g., fish kills and algae blooms, and can be a significant health hazard, e.g., high levels of pathogens in swimming areas or incidental contact with raw sewage near areas of the spill.

This is the joint work of Robert Schuerger, Michael Simon and Robert Arno.

1600- Log #35 Final Action:
(5.6.6 (New))

Submitter: Robert Schuerger, HP Critical Facilities Services
Recommendation: Add text to read as follows:

5.6.6 The prevention strategy should include the use of the following gradient scale in the determining how critical the individual infrastructure elements are to both responding/recovering from the event and also in mitigating further escalation of the damages:

Category I – Systems that have been designated to remain operational or be immediately restorable to service after the event for emergency services to function or to prevent significant escalation of the damages.

Category II – Systems that have been designated to significantly contribute to the delivery of emergency services or are essential for disaster recovery or to prevent significant escalation of the damages. Category II systems are typically restorable to operation within 4 hours.

Category III – Systems that have significant impact on the protection of life and property, but are not immediately essential for providing emergency services or to prevent significant escalation of the damages. Category III systems are typically restorable to operation within 24 hours.

Category IV – Critical systems that have significant impact on the protection of life and property, but are not immediately essential, as there are multiple systems or facilities providing the same function. Category IV systems are typically restorable to operation within 24 hours for the time utility power, water and sewage disposal are available to the facility.

Substantiation: Major disasters, such as floods from hurricanes and earth quakes significantly disrupt normal transportation and communication lines. Relief efforts are stopped before they can get started if there is no way for them to find out where the relief is needed and how to get to the area.

Major disasters also significantly disrupt normal services, such as electrical power, natural gas, water and sewage service. How quickly relief is required before the situation becomes life threatening to the general population varies significantly due to the circumstances. In all cases the loss of water and sewage will significantly impact the general public in a matter of a few days. Health related issues due to water contamination can escalate much quicker.

For example, take the health risks due to loss of sewage pumping station. For the most part, sewage systems or pump stations are generally in the lowest surrounding area. Typically pumping stations don't have a holding pond available. The sewer enters a wet well located at the pumping station and how much storage the wet well and incoming sewer have determines how long the pumping station can be out of service before it begins to back up into basements or overflow out of manholes. At high flows for larger pumping stations, this is generally not a huge amount of time (in some cases this may be between 15 minutes to half an hour). Backups and overflows are both health and environmental issues.

Wastewater that backs up in basements can cause significant damage to homes and is generally a significant health concern for the residents. Cleanup includes throwing away anything that cannot be safely cleaned up and disinfected. Cleanup requires proper personal protection and care in dealing with raw sewage. If the backup were to a business, the amount of damage or problems that can occur would obviously depend upon the extent of the backup (how much and how long), what kind of equipment, storage, or other use the business makes of its lower level(s), how the backup may affect the health and well being of employees and customers, and how it affects the general operation of the business itself.

Wastewater that is released into the environment can cause environmental damage, e.g., fish kills and algae blooms, and can be a significant health hazard, e.g., high levels of pathogens in swimming areas or incidental contact with raw sewage near areas of the spill.

Therefore hardening the key pieces of the infrastructure (such as 911 Call Centers) that are required for recovery from the event or to mitigate significant escalation of the damages should be specifically addressed as part of the Prevention strategy. The essential infrastructure elements should be given a priority ranking, so the most critical elements receive the most resources.

This is the joint work of Robert Schuerger, Michael Simon and Robert Arno.

1600- Log #11 Final Action:
(6.2.3)

Submitter: Jo Robertson, Falls Church, VA
Recommendation: Revise text to read as follows:
6.2.3* Mutual aid/assistance agreements, if appropriate, shall be documented in the program.
Substantiation: Mutual aid agreements are not necessarily feasible for all organizations, especially in the private sector.

1600- Log #12 Final Action:
(6.3)

Submitter: Jo Robertson, Falls Church, VA
Recommendation: Revise text to read as follows:
6.3* Communications and Warning.
6.3.1* The entity shall determine communications and warning needs, based on required capabilities to execute plans.
6.3.2* Communications and warning systems shall be reliable, redundant, and interoperable.
6.3.3* Emergency communications and warning protocols and procedures shall be developed, tested, and used to alert ~~stakeholders~~ people potentially impacted by an actual or impending ~~incident~~ emergency.
6.3.4 Advisory and warning systems shall be integrated into planning and operational use.
6.3.5* The entity shall develop and maintain the following capabilities:
~~(1) Communications between the levels and functions of the organization and outside entities~~
~~(2) Documentation of communications (3) Communications with emergency responders (4) Central contact facility or communications hub~~
(1) A structure and process for communications to stakeholders throughout the organization as well as outside entities like emergency responders and the media.
(2) A process that ensures all information is coordinated through a central ~~contact facility or~~ communications hub
6.3.6 The entity shall establish, implement, and maintain procedures to disseminate warnings and requests for information.
6.3.7 ~~The entity shall develop procedures to advise the pub- lic, through authorized agencies, of threats to life, property, and the environment.~~
~~6.3.8* The entity shall disseminate warning information to stakeholders potentially impacted.~~
~~6.3.9~~ The entity shall document issued warnings.
[Note: It would make sense to move section 6.3 closer to section 6.8 to position the communications sections closer together. Is this something we can consider please?]
Substantiation: Revised wording is meant to further clarify this section of the standard and remove unnecessarily confusing language.

1600- Log #4 Final Action:
(6.3.5)

Note: This proposal appeared as Comment 1600-126 (Log #6) which was held from the Fall 2009 ROC on Proposal 1600-2.

Submitter: Jo Robertson, Falls Church, VA

Recommendation: Revise text as follows:

6.3.5* The entity shall develop and maintain the following capabilities:

~~(1) Communications between the levels and functions of the organization and outside entities~~

(1) A structure and process for communications to stakeholders throughout the organization as well as outside entities like emergency responders and the media.

(2) A process that ensures all information is coordinated through a central communications hub.

~~(2) Documentation of communications~~

~~(3) Communications with emergency responders~~

~~(4) Central contact facility or communications hub~~

Substantiation: Wording throughout the communications sections should be clearer and more concise with less confusing overlap. Recommendations should be consistent with *Implementing NFPA 1600* guidance.

Original 6.3.5 (2) text has been struck because it repeats 6.3.8 as rewritten.

Original 6.3.5 (3) text has been struck because it repeats the rewrite of 6.3.5 (1).

Original 6.4.5 (4) text has been reworded more clearly with 6.3.5 (2).

1600- Log #5 Final Action:
(6.4)

Note: This proposal appeared as Comment 1600-132 (Log #52) which was held from the Fall 2009 ROC on Proposal 1600-2.

Submitter: Doug Harrison, Georgian Emergency Management & Associates, Inc

Recommendation: Delete entire section. Insert new section as follows:

6.4 Plans and Procedures

6.4.1 The entity shall develop, coordinate, maintain an implement plans and procedures to support the emergency management program. Plans detail policies, basic concepts, organizational structures and roles and responsibilities. Procedures are more detailed and outline specific steps and actions to implement various functions (e.g. public alerting, EOC activation, etc.)

6.4.2 Emergency management program plans for program elements (or components) include a prevention plan, a mitigation plan, emergency response/operations plan, recovery plan and continuity plan. Each of these plans contains appropriate content for the hazards and risks identified in the hazard and risk assessment process. Emergency management program administrative plans included a strategic plan and annual business plan.

6.4.3 Procedures shall be developed to detail specific steps and actions for each plan element (component) as necessary. Emergency response/operations procedures shall detail arrangements between emergency operations centers and the various components of the Incident Management System.

6.4.4 A plan and procedure shall be developed to access the situation and impact for each identified hazard in the event of an emergency incident. The situational analysis shall include content for damage and needs assessments and identify emergency response and recovery activities by priority.

6.4.5 Emergency response/operations procedures shall allow for the concurrent activities of mitigation, response, recovery and continuity during the emergency incident.

Substantiation: Procedures are different from plans and have been explained in the revised text. A variation of this suggestion could be a separate section for plans and procedures. Plans and procedures must also be related to the modern emergency management all hazards comprehensive program.

1600- Log #13 Final Action:
(6.5.3)

Submitter: Jo Robertson, Falls Church, VA
Recommendation: Revise text to read as follows:
6.5.3 The plan shall include the following:
(1) Communication and warning in accordance with Section 6.3
(2) Crisis communication and public information in accordance with Section 6.8
(3) Protective actions for life safety
(4) ~~Direction and control in accordance with Section 6.8~~
~~(5)~~ Resource management in accordance with Sections 6.1 and 6.2
~~(6)~~ (5) Donation management in accordance with 6.1.7
Substantiation: (4) is an unnecessary duplication of (2) and should be removed.

1600- Log #48 Final Action:
(6.7)

Submitter: Paul Dimond, University of California, Berkeley
Recommendation: Add text to read as follows:
6.7 Business Continuity and Recovery.
6.7.1* The continuity plan shall identify stakeholders that need to be notified; critical and time-sensitive applications; alternative work sites; vital records, contact lists, processes, and functions that must be maintained; and personnel, procedures, and resources that are needed while the entity is recovering.
6.7.2 The recovery plan shall provide for restoration of functions, services, resources, facilities, programs, and infrastructure.
6.7.3 Both continuity and recovery plans shall identify the mitigation and preparedness elements needed to support continuity and recovery.
Substantiation: The addition of this sentence is meant to counter a common misconception: that continuity & recovery plans consist primarily of procedures to follow after a disruptive event occurs. In fact, a key insight about continuity & recovery planning is that the most effective and least costly strategies generally require actions in advance. For example,
-- If temporarily working from home is a continuity strategy for some employees, those employees should practice doing so in advance, to ensure that they can access & operate the needed systems from home.
-- If paper records are vital to the business, those records should be stored off the floor (against flooding) or in fire-resistant cabinets (against fire) or replaced with electronic records (against all hazards).
-- If essential skills are possessed uniquely by one employee, another employee should be cross-trained ahead of time to perform that employee's tasks if needed.

Indeed, the organizational resilience that supports effective continuity & recovery is achieved mainly in advance of the disruptive event; plans that specify post-event procedures, while important, may be difficult to implement without pre-event mitigation & preparedness.

1600- Log #14 Final Action:
(6.8)

Submitter: Jo Robertson, Falls Church, VA
Recommendation: Revise text to read as follows:

6.8* Crisis Communications and Public Information.

6.8.1* The entity shall develop a crisis communications plan and procedures to gather and disseminate ~~and respond to requests for pre-incident, incident, and post-incident information to and from~~ emergency or crisis information to the following:

(1) Internal audiences including employees
(2) External audiences including the media and special needs populations

6.8.2* ~~A capability shall be established and maintained to~~ The entity's crisis communications capability shall include the following:

(1)*Central notification point ~~contact facility~~
(2) System for ~~gathering, monitoring, and disseminating~~ gathering and monitoring information
(3) Procedures for developing and delivering coordinated messages
(4) Pre-scripted information bulletins or templates
(5) Protocol to ~~coordinate and~~ clear information for release

6.8.3 The entity shall establish a physical or virtual information center.

Substantiation: Revised wording is meant to further clarify this section of the standard and remove unnecessarily confusing language.

1600- Log #18 Final Action:
(7.5)

Submitter: Dean R. Larson, Purdue University Calument
Recommendation: Revise text to read as follows:

7.5 Exercise Design.

Exercises shall be designed to do the following:

(1) Insure the safety of people, property, and processes involved in the exercise or testing.
(2) Evaluate the program
(3) Identify planning and procedural deficiencies
(4) Test or validate recently changed procedures or plans
(5) Clarify roles and responsibilities
(6) Obtain participant feedback and recommendations for program improvement
(7) Measure improvement compared to performance objectives
(8) Improve coordination between internal and external teams, organizations, and entities
(9) Validate training and education
(10) Increase awareness and understanding of hazards and the potential impacts of hazards on the entity
(11) Identify additional resources and assess the capabilities of existing resources, including personnel and equipment needed for effective response and recovery.

Substantiation: If an injury occurs during an exercise or testing, the event must stop and will have an undesirable outcome; the injury becomes the outcome. At best, part of the team is lost because of the injury. At worst, the team member will have to be replaced. If a team member is replaced, the team is disrupted; the training must be "replaced" with a new team member, and new teamwork relations must be established. The time spent on the exercise might result in the participants learning the wrong objective: "I am going to get hurt if I do it that way." The decision might be reached in error that the tactics and procedures used when the injury occurred are incorrect just because someone was hurt, not because the "wrong" tactic was chosen. Injuring someone during an exercise or testing is not acceptable.
This is not original material; its reference/source is as follows:
ISO/TC 22393 Committee Draft (CD) Societal security – Guidelines for exercises and testing.

1600- Log #28 Final Action:
(7.5)

Submitter: Dean R. Larson, Purdue University Calumet
Recommendation: Revise text to read as follows:
7.5* Design of Exercises and Testing.
Substantiation: Chapter 7 is entitled "Testing and Exercises" but the 2010 Edition does not include a section designing testing.

1600- Log #15 Final Action:
(8.1.3)

Submitter: Jo Robertson, Falls Church, VA
Recommendation: Revise text to read as follows:
8.1.3 The program ~~shall~~ should also be re-evaluated when any of the following occur:
(1) Regulatory changes
(2) Changes in hazards and potential impacts
(3) Resource availability or capability changes
(4) Organizational changes
(5)*Funding changes
(6) Infrastructure, economic, and geopolitical changes
(7) Changes in products or services
(8) Operational changes
Substantiation: Regulatory changes (1) that don't impact the organization shouldn't necessarily trigger a program re-write. Similarly, a well-created program won't change because of a political election in the country where the organization operates.
This statement just seems overly prescriptive. "Should" (rather than "shall") seems more in alignment with the intention of this section.

1600- Log #30 Final Action:
(A..x (New))

Submitter: Dean R. Larson, Purdue University Calumet
Recommendation: New text to read as follows:
Add *Implementing NFPA 1600: National Preparedness Standard* to Annex ___ Informational References
Substantiation: This handbook is identified in the following paragraph but does not appear in Annex E. Informational Resources in NFPA 1600 2010 Edition.
A.1.3 The application of *NFPA 1600* within the private sector is described in detail in a handbook, *Implementing NFPA 1600, National Preparedness Standard,* written by members of the Technical Committee on Emergency Management and Business Continuity, who are responsible for the standard. This handbook is available from the NFPA catalog of publications at www.nfpa.org.

1600- Log #22 Final Action:
(A.1.1)

Submitter: Dean R. Larson, Purdue University Calumet
Recommendation: Add new text to read as follows:
A.1.1 The emergency management and business continuity community comprises many different entities, including the government at distinct levels (e.g., federal, state/provincial, territorial, tribal, indigenous, and local levels); business and industry; not-for-profit, nongovernmental organizations; and individual citizens. Each of these entities has its own focus, unique missions and responsibilities, varied resources and capabilities, and operating principles and procedures.
Substantiation: Adding "not-for-profit" makes this paragraph agree with *1.3* Application*.

1600- Log #23 Final Action:
(A.1.2)

Submitter: Dean R. Larson, Purdue University Calumet
Recommendation: Add new text to read as follows:
A.1.2 This standard promotes a common understanding of the fundamentals of planning and decision making to help entities examine all hazards and produce an integrated, coordinated, and synchronized program for Disaster/Emergency Management and Business Continuity.
Substantiation: Adding the recommended text reinforces the unique nature of NFPA 1600 by reminding the users the program is integrated with Disaster/Emergency Management AND Business Continuity.

1600- Log #27 Final Action:
(A.3.3.x (New))

Submitter: Dean R. Larson, Purdue University Calumet
Recommendation: Add new text to read as follows:
A.3.3.x Testing. The procedures which is used to assess the capability with a "pass or fail" Testing is sometimes called a "trial" and used with assessing supporting plans. Testing should start with simple component testing building toward system testing. As with exercise, the intent of testing is to improve the overall performance of an entity.
Substantiation: The recommended addition to Annex A is intended for clarifying the new definition for Testing.
This is not original material; its reference/source is as follows:
ISO/TC 22398 Societal security - Standard for exercises and testing.

1600- Log #25 Final Action:
(A.3.3.9)

Submitter: Dean R. Larson, Purdue University Calumet
Recommendation: Revise text to read as follows:

~~A.3.3.9 Exercise. Exercise is the principal means of testing a program's ability to implement its response procedures. It allows the entity and other agencies and organizations to practice procedures and interact with other agencies in a controlled setting. Participants identify and make recommendations to improve the overall program. The fundamental purpose is to improve the implementation of procedures. In support of that goal, an exercise should be used to achieve the following:~~

~~(1) Reveal planning weaknesses and strengths in the plan or standard operating procedures/standard operating guidelines (SOP/SOG), or to test and validate recently changed procedures~~

~~(2) Improve the coordination between various response organizations, elected officials, and community support organizations~~

~~(3) Validate the training of the critical elements of response (e.g., incident command, hazard recognition, evacuation, decontamination)~~

~~(4) Increase the entity's general awareness and understanding of the hazards present~~

~~(5) Identify additional resources, equipment, or personnel needed to prepare for and respond to an incident~~

~~Exercises include activities performed for the purpose of training and conditioning team members and personnel in appropriate responses, with the goal of achieving maximum performance.~~

~~An exercise can involve invoking response and operational continuity procedures, but is more likely to involve the simulation of a response or operational continuity incident, or both, announced or unannounced, in which participants role-play in order to identify those issues that might arise, prior to a real invocation.~~

A.3.3.9 Exercise. Exercises and can be used for: validating policies, plans, procedures, training, equipment, and interorganizational agreements; clarifying and training personnel in roles and responsibilities; improving inter-organizational coordination and communications; identifying gaps in resources; improving individual performance; and identifying opportunities for improvement, and controlled opportunity to practice improvisation. A test is a unique and particular type of exercise, which incorporates an expectation of a pass or fail element within the goal or objectives of the exercise being planned.

Substantiation: The revised definition clarifies and simplifies while focusing on the improving the performance of the entity. Portions of the existing A.3.3.9 have been proposed as a new A.7.5 Exercise Design.
This is not original material; its reference/source is as follows:
ISO/TC 22398 Societal security - Standard for exercises and testing.

1600- Log #37 Final Action:
(A.5.4 (New))

Submitter: Robert Schuerger, HP Critical Facilities Services
Recommendation: Add new text to read as follows:

A.5.4 Risk Assessment

There are multiple ways to perform a Risk Assessment:

(1) "What-if": The purpose of the what-if analysis is to identify specific hazards or hazardous situations that could result in undesirable consequences. This technique has limited structure and relies on knowledgeable individuals who are familiar with the operation of the critical systems, the interaction between critical systems and the broad range of potential failures that could occur. The value of this type of Risk Assessment is totally dependent on the quality of the team performing it and how thorough they are in determining all of the significant hazards. This is the most basic method and is included to some extent in all of the following methods.

(2) Checklist: A specific list of items is used to identify risks, specific hazards and hazardous situations by comparing the current or projected situations with accepted standards and risk assessments performed on similar systems. The person initially developing the checklist would typically review applicable standards on the equipment and systems to be analyzed to collect what information is available from analysis on similar equipment or systems. The value of this type of Risk Assessment is dependent on the quality of the checklist as to whether it accurately includes all of the significant hazards and the skill and understanding of the checklist user. Where comprehensive information is available developed by industry experts on the equipment and systems to be analyzed, this type of risk assessment can be very effective.

(3) Failure Modes, Effects and Criticality Analysis (FMECA): Each element in a system is examined individually and collectively to determine the effect when one or more elements fail. This is a bottom-up approach: each of the elements is examined, all of the ways it can fail are listed (failure modes) and the effect of each failure to the element itself and on the overall system is predicted. Then a criticality level is assigned for each failure mode, base on the overall effect on the system. An interdisciplinary team is required and it is time consuming in direct proportion to how thorough and to what level of detail the analysis is taken. This technique is well suited for assessing potential equipment failures and how they impact the overall mission of the system being analyzed. The value of this type of Risk Assessment is dependent on the skill and understanding of the team performing the analysis and how comprehensive the scope is for the analysis.

(4) Fault Tree Analysis (FTA): This is a top-down approach where an undesirable event is identified as the "top event" in the "tree" and the potential causes that could lead to the undesirable event are identified as "branches" below. Boolean Algebra is used to connect the potential causes of failure in the branches to other branches and the top event. If the failure rate and repair data is available for all of the initiating failures in the Fault Tree, quantitative results (unreliability and unavailability) can be calculated for the "top event" and each of the branches. The value of the assessment is dependent on the competence of the team in using the FTA process, on their skill and understanding of the systems they are analyzing, and on the depth to which they take the analysis. In addition to the major benefit of quantitative analysis, FTA also specifically addresses an individual issue and is therefore ideal for incremental improvement over time. An individual systems (such as waste water) or type of facility (911 Call Center) can be comprehensively analyzed.

(5) Reliability Block Diagram (RBD): An RBD is a block diagram in which the major components are connected together in the same manner as they are in an electrical one-line diagram or mechanical piping diagram. Each of the blocks have the failure and repair data for that component included in the block. The junctions connecting the block are set according to the system redundancy (e.g. "one out of two" when there are two components and only one is required to carry the load). Quantitative results (reliability, availability, etc.) for the RBD are obtained by performing the series and parallel combinations of the blocks. RBD is a very effective tool in providing quantitative analysis for system that have flow characteristics (such as electrical power, water and waste water systems). It is more intuitive and less prone to major omissions in the analysis than the previous methods, since the RBD is primarily based on the electrical one-line diagram or mechanical piping diagrams. The value of this type of Risk Assessment is dependent on the availability and accuracy of failure and repair data for the equipment being modeled, the accuracy in which the RBD matches the system being analyzed and the quality of the statistician or software program used to perform the calculations.

Methods 1 thru 3 are strictly qualitative analysis. Methods 4 and 5 can provide qualitative analysis, provided the failure and repair rates for the equipment being modeled are available. The method used for the Risk Assessment should be comparable with the criticality of the system being analyzed. A gradient level of risk assessment, with probabilistic modeling providing the quantitative method used for the most critical systems, greatly increases the probability that they will be designed sufficiently robust so that they are available when needed to deliver emergency services and provide

for disaster recovery.

Substantiation: Major disasters, such as floods from hurricanes and earth quakes significantly disrupt normal transportation and communication lines. Relief efforts are stopped before they can get started if there is no way for them to find out where the relief is needed and how to get to the area.

Major disasters also significantly disrupt normal services, such as electrical power, natural gas, water and sewage service. How quickly relief is required before the situation becomes life threatening to the general population varies significantly due to the circumstances. In all cases the loss of water and sewage will significantly impact the general public in a matter of a few days. Health related issues due to water contamination can escalate much quicker.

The requirement for the various types of critical systems needs to align with the importance of the system to the protection of life and property. A gradient level of risk assessment with probabilistic modeling provides a quantitative method to ensure the most critical systems have designed sufficiently robust so that they are available when needed to deliver emergency services and provide for disaster recovery.

Therefore hardening the key pieces of the infrastructure (such as 911 Call Centers) that are required for recovery from the event or to mitigate significant escalation of the damages should be specifically addressed as part of the Prevention strategy. The essential infrastructure elements should be given a priority ranking, so the most critical elements receive the most resources. It also provides the sequence in which to make incremental improvements most effectively.

This is the joint work of Robert Schuerger, Michael Simon and Robert Arno.

1600- Log #34 Final Action:
(A.5.4.3 and A.5.4.5 (New))

Submitter: Robert Schuerger, HP Critical Facilities Services
Recommendation: Add text to read as follows:

(6) Determine the maximum acceptable down time (MAD) [or maximum acceptable outage time (MAO)] for each process, based on the identified consequences and the critical success factors for the function. The MAD (MAO) represents the maximum period of time the organization can tolerate the loss of capability.

(7) Determine the rate at which the severity of the identified consequences increase by if the MAD is not met.

(8) Confirm the current level of preparedness of the critical processes to manage a disruption. This might include evaluating the level of redundancy within the process (e.g., spare equipment) or the existence of alternate suppliers.

A.5.4.5 There are essential infrastructure elements required to respond/recover from the event, such communication facilities (911 Call Centers) for the police and fire departments. The water supply and waste water removal systems have critical elements, such as key pumping stations that broadly affect the distribution of water or prevent release of sewage.

Substantiation: Major disasters, such as floods from hurricanes and earth quakes significantly disrupt normal transportation and communication lines. Relief efforts are stopped before they can get started if there is no way for them to find out where the relief is needed and how to get to the area.

Major disasters also significantly disrupt normal services, such as electrical power, natural gas, water and sewage service. How quickly relief is required before the situation becomes life threatening to the general population varies significantly due to the circumstances. In all cases the loss of water and sewage will significantly impact the general public in a matter of a few days. Health related issues due to water contamination can escalate much quicker.

For example, take the health risks due to loss of sewage pumping station. For the most part, sewage systems or pump stations are generally in the lowest surrounding area. Typically pumping stations don't have a holding pond available. The sewer enters a wet well located at the pumping station and how much storage the wet well and incoming sewer have determines how long the pumping station can be out of service before it begins to back up into basements or overflow out of manholes. At high flows for larger pumping stations, this is generally not a huge amount of time (in some cases this may be between 15 minutes to half an hour). Backups and overflows are both health and environmental issues.

Wastewater that backs up in basements can cause significant damage to homes and is generally a significant health concern for the residents. Cleanup includes throwing away anything that cannot be safely cleaned up and disinfected. Cleanup requires proper personal protection and care in dealing with raw sewage. If the backup were to a business, the amount of damage or problems that can occur would obviously depend upon the extent of the backup (how much and how long), what kind of equipment, storage, or other use the business makes of its lower level(s), how the backup may affect the health and well being of employees and customers, and how it affects the general operation of the business itself.

Wastewater that is released into the environment can cause environmental damage, e.g., fish kills and algae blooms, and can be a significant health hazard, e.g., high levels of pathogens in swimming areas or incidental contact with raw sewage near areas of the spill.

This is the joint work of Robert Schuerger, Michael Simon and Robert Arno.

1600- Log #38 Final Action:
(A.5.6 (New))

Submitter: Robert Schuerger, HP Critical Facilities Services
Recommendation: Add new text to read as follows:

A 5.6.6 In order to ensure the most critical systems are available when needed, specific criteria are needed as part of the gradient scale. Shown below are guidelines that provide some of the details to be included in the prevention strategy.

Category I – Systems that have been designated to remain operational or be immediately restorable to service after the event for emergency services to function or to prevent significant escalation of the damages. On-site generation capable of supporting the critical systems for 72 hours with only refueling and minor servicing (no loss of power to the critical systems while servicing) is required. Risk assessment should include probabilistic modeling, such as fault tree or reliability block diagram (RBD) for the electrical power to the Category I systems to verify an availability of 0.9999 and a mean time to repair of less than 1.0 hours. The probabilistic modeling shall also include naturally occurring hazards, such as earthquakes, floods, hurricanes and snow/ice storms to the extent that weather data is available. For hazards for which there is no data available, such as human-caused events, the risk assessment should include a systematic method analysis, such as FMECA or fault tree. The analysis should what types of events are most likely to cause the critical systems to be taken out of service with a mitigation strategy to minimize the probability of it occurring.

Category II – Systems that have been designated to significantly contribute to the delivery of emergency services or are essential for disaster recovery or to prevent significant escalation of the damages. Category II systems are typically restorable to operation within 4 hours. Risk assessment should include probabilistic modeling, such as fault tree or reliability block diagram (RBD) for the electrical power to the Category II systems to verify an availability of 0.9995 and a mean time to repair of 4.0 hours or less. The probabilistic modeling shall also include naturally occurring hazards, such as earthquakes, floods, hurricanes and snow/ice storms to the extent that weather data is available. For hazards for which there is no data available, such as human-caused events, the risk assessment should include a systematic method analysis, such as FMECA or fault tree. The analysis should include what types of events are most likely to cause the critical to be taken out of service with a mitigation strategy to minimize the probability of it occurring.

Category III – Systems that have significant impact on the protection of life and property, but are not immediately essential for providing emergency services or to prevent significant escalation of the damages. Category III systems are typically restorable to operation within 24 hours. Risk assessment may include probabilistic modeling, such as fault tree or reliability block diagram (RBD) for the electrical power to the Category III systems to verify an availability of 0.9973 and a mean time to repair of 24.0 hours or less. The agency determining the criticality of the facility may deem qualitative analysis is sufficient for Category III systems. The analysis should include what types of events are most likely to cause the critical system to be taken out of service with a mitigation strategy to minimize the probability of it occurring.

Category IV – Critical systems that have significant impact on the protection of life and property, but are not immediately essential, as there are multiple systems or facilities providing the same function. Category IV systems are typically restorable to operation within 24 hours for the time utility power, water and sewage disposal are available to the facility. A qualitative analysis is sufficient for Category IV systems. The analysis should includes what types of events are most likely to cause the critical system to be taken out of service with a mitigation strategy to minimize the probability of it occurring.

Substantiation: Major disasters, such as floods from hurricanes and earth quakes significantly disrupt normal transportation and communication lines. Relief efforts are stopped before they can get started if there is no way for them to find out where the relief is needed and how to get to the area.

Major disasters also significantly disrupt normal services, such as electrical power, natural gas, water and sewage service. How quickly relief is required before the situation becomes life threatening to the general population varies significantly due to the circumstances. In all cases the loss of water and sewage will significantly impact the general public in a matter of a few days. Health related issues due to water contamination can escalate much quicker.

The requirement for the various types of critical systems needs to align with the importance of the system to the protection of life and property. A gradient level of risk assessment with probabilistic modeling provides a quantitative method to ensure the most critical systems have designed sufficiently robust so that they are available when needed to deliver emergency services and provide for disaster recovery. A set of specific requirements for the various levels of criticality needs to be included in the article to provide direction, adequate design criteria and for consistent application.

The classifying governmental agency having jurisdiction would benefit from consistent guidelines to be use in determining which systems in their jurisdiction should be addressed. A gradient level of criticality provides a method to

ensure the most critical systems have the resources allocated to them so that they are available when needed to deliver emergency services and provide for disaster recovery.

Therefore hardening the key pieces of the infrastructure (such as 911 Call Centers) that are required for recovery from the event or to mitigate significant escalation of the damages should be specifically addressed as part of the Prevention strategy. The essential infrastructure elements should be given a priority ranking, so the most critical elements receive the most resources. It also provides the sequence in which to make incremental improvements most effectively.

This is the joint work of Robert Schuerger, Michael Simon and Robert Arno.

1600- Log #29 Final Action:
(A.7.5 (New))

Submitter: Dean R. Larson, Purdue University Calumet
Recommendation: Add new text to read as follows:

Exercises and testing should be used to achieve the following:

(1) Reveal planning weaknesses and strengths in the plan or standard operating procedures/standard operating guidelines (SOP/SOG), or to test and validate recently changed procedures

(2) Improve the coordination between various response organizations, elected officials, and community support organizations

(3) Validate the training of the critical elements of response (e.g., incident command, hazard recognition, evacuation, decontamination)

(4) Increase the entity's general awareness and understanding of the hazards present

(5) Identify additional resources, equipment, or personnel needed to prepare for and respond to an incident

(6) Include activities performed for the purpose of training and conditioning team members and personnel in appropriate responses, with the goal of achieving maximum performance.

An exercise can involve invoking response and operational continuity procedures, but is more likely to involve the simulation of a response or operational continuity incident, or both, announced or unannounced, in which participants role-play in order to identify those issues that might arise, prior to a real invocation.

Substantiation: A portion of this recommended addition to Annex A exists as *A.3.3.9 Exercise* in the 2010 Edition.

1600- Log #46 Final Action:
(B.2)

Submitter: Michael A. Anthony, University of Michigan / Rep. APPA.ORG - Leadership in Education
Recommendation: Include the ISO TC 223 Committee on Societal Security web page in this list:

http://www.iso.org/iso/iso_technical_committee.html?commid=295786

B.2 Web Sites of Interest. Web sites are included as examples of program development resources available on the Internet. Inclusion in this annex does not constitute an endorsement. The user is cautioned that website addresses change, and a search engine might be needed to locate the correct URL.

Substantiation: There is a fair amount of correlation between the ISO document and the NFPA document and a URL will hasten harmonization where appropriate for both organizations. More detailed information about the ISO business plan for this document is available here:
http://isotc.iso.org/livelink/livelink/fetch/2000/2122/687806/ISO_TC_223__Societal_security_.pdf?nodeid=6145327&vernum=-2

1600- Log #41 Final Action:
(Annex E)

Submitter: Michael A. Anthony, University of Michigan / Rep. APPA.ORG - Leadership in Education - Association of Education Facility Executives
Recommendation: Add the following text to the list in this section:
IEEE 493-2007 - IEEE Recommended Practice for the Design of Reliable Industrial and Commercial Power Systems
Substantiation: The IEEE "Gold Book" (493) is the most comprehensive document on quantitative methods for electrical power system reliability in the world. Since reliable power systems are as important to life safety as homeland security, all NFPA committees should have this book as a reference document in order to become more familiar with the terms of art of reliability engineering. For the first time, this reference document appeared in the 2011 National Electrical Code in Chapter 7:
"…Informational Note: Assignment of degree of reliability of the recognized emergency supply system, or equivalency of other methods, depends on the careful evaluation of the variables at each particular installation. For further information on quantitative methods for assessing power system reliability, see ANSI/IEEE 493-2007, Recommended Practice for the Design of Reliable Industrial and Commercial Power Systems…."
Members of that NEC committee agreed that this resource offered a way to convey opinions about power security into the realm of science. Very often, the AHJ is put in the position of having to assess the reliability and availability of security-related infrastructure. It would be reasonable for the AHJ to ask for reliability calculations, much as he or she might ask for short circuit or ampere demand calculations in a power system design. Unfortunately, the training of many electrical engineers does not include formal, reliability analysis so reference to this document will provide a starting point for establishing equivalencies in the reliability assumptions that form the foundation of business continuity risk assessments.

1600- Log #45 Final Action:
(Annex E)

Submitter: Robert G. Arno, EYP Mission Critical Facilities, Inc.
Recommendation: Add new text to read as follows:
US Army Corps of Engineers Technical Manual (TM) 5-698-1Reliability/Availability of Electrical and Mechanical Systems for C4ISR Facilities
Substantiation: Supporting data for risk assessment is very hard to find. Statistical methods addressing risk assessments are only as good as the accurate details found in databases. This database is the most comprehensive Reliability and Maintainability data source in the world. Listing statistically sound information on over 300 different components comprising the makeup of a facility.
The suggestion is to not only reference the database but to add the database to NFPA 1600 in the reference section. Included in this section would also be the definitions used in creating the database's statistics. This would provide the user a comprehensive source of information at the analyst finger tips.

1600- Log #47 Final Action:
(E.2)

Submitter: Michael A. Anthony, University of Michigan / Rep. APPA.ORG - Leadership in Education - Association of Educational Facility Executives

Recommendation: To the list of Informational References, add the following peer reviewed paper, which was presented at the IEEE Industrial Applications Society Technical Meeting in Newport Beach California, May 1-5, 2011
"Reliability Engineering Applied to Critical Operations Power Systems (COPS)" Michael Anthony, Robert Arno, Mark Beirne Patrick Saad Saba, Robert Schuerger PE

Substantiation: The best emergency management decisions when quantitative approaches inform qualitative assessments -- and vice-versa. This is an example of a quantitative approach to designing and affirming the availability of 911 communications center. The paper, presented by Robert Arno at the conference, is attached herewith

Note: Supporting material is available for review at NFPA Headquarters.

1600- Log #17 Final Action:
(Annex Z (New))

Submitter: Dean R. Larson, Purdue University Calumet
Recommendation: Add new text annex material:

APELL (Awareness and Preparedness for Emergencies at the Local Level) consists of a series of programs developed in 1988 under the leadership of the United Nations Environmental Programme (UNEP) with the cooperation of multiple organizations, including the U.S. EPA, in response to the tragic accident in Bhopal, India. APELL is a multi-stakeholder dialogue tool that establishes adequate coordination and communication in situations where the public might be affected by accidents and disasters.

APELL process implementation consists of ten steps:

- Step ONE - Identify the emergency response participants and establish their roles, resources and their concerns,
- Step TWO - Evaluate the hazards and risks that may result in emergency situations in the community,
- Step THREE - Have participants review their own emergency response plans for adequacy relative to a co-ordinated response
- Step FOUR - Identify the required response tasks not covered by existing plans
- Step FIVE - Match the Step 4 tasks to the resources available from the identified participants
- Step SIX - Make changes necessary to improve existing plans and integrate existing plans into an overall community plan and gain agreement
- Step SEVEN - Commit an integrated community plan to writing and get approvals from the local government
- Step EIGHT - Educate participating groups about the integrated plan and ensure that all responders are trained
- Step NINE - Establish procedures for periodic testing, review and updating of the plan
- Step TEN - Educate the general community on the integrated emergency response plan

The APELL process informs the community about the risks they are exposed to and educates the community on how to react to accidents/disasters. The program promotes the coordination between representatives from the industry, the local level institutions and the public. The APELL process included the preparation of an integrated community preparedness plan, including preparing the community for early warnings of emergencies.

The APELL program for technological hazards was implemented over ten years ago in Bahía Blanca, Argentina a city located in the south east of the province of Buenos Aires, Argentina, by the Atlantic Ocean. It has a population of over 300,000 inhabitants. The city has an important sea port with a depth of 40 feet (12 m), kept constant upstream almost all along the length of the bay, where the Naposta Stream drains. Bahía Blanca means "White Bay". The name is due to the typical color of the salt covering the soils surrounding the shores.

The need for the APELL program in Bahia Blanca is reinforced when reviewing the number and amounts of hazardous chemicals produced each year. The industrial complex is made up of three types of industry: Petroleum Industry with an installed capacity of 4 million tons a year producing ethanol, petrol, naphtha, GLP, fuel oil, gas oil, gasoline, asphalt, kerosene; Petrochemical Industry installed capacity of 3.4 million tons a year with ethylene, VCM, PVC, polyethylene, urea, pure ammonia as products; and, Chemical Industry installed capacity of 350 thousand tons a year producing chlorine, caustic soda.

Led by Ing. Nestor Sposito, of Dow Chemical in Bahia Blanca and a member of the NFPA Capitulo Argentina, the APELL program for technological hazards as been successfully used to implement NFPA 1600 Standard on Disaster/Emergency Management and Business Continuity Programs, a standard developed to define a program for the integration of Emergency Management and Business Continuity, applicable to the private, public, and not-for-profit sectors. The community support for the project has been excellent led the mayor of Bahia Blanca establishing the goal for his city to be the first in the world to implement NFPA 1600. Due to the success of combining APELL with NFPA 1600 in Argentina, a recent conference held with representatives of chemicals companies in Zhanjiagang, China included presentations on the Bahia Blanca project and on NFPA 1600.

IRAM, the national standards body of Argentina, issued IRAM/NFPA 1600 as their national standard, the result of nearly three years of cooperative effort between NFPA volunteers in both Argentina and the United States including working with the APELL process in Bahia Blanca.

Other APELL programs have been produced for mining, port areas, multi-hazards, transportation, and tourism and are available at http://www.unep.fr/scp/sp/.

Substantiation: In response to the Bhopal incident, under the leadership of the United Nations Environmental Programme [correct spelling] (UNEP), a group representing various, including the U.S. Environmental Protection Agency, the APELL (Awareness and Preparedness for Emergencies at the Local Level) for Technological hazards. Additional APELL programs for mining, port areas, multi-hazards, transportation, and tourism have been developed.

In 2010, NFPA signed a MOU with UNEP to share various NFPA programs including NFPA 1600. APELL programs are a current "tool" for implementation of NFPA 1600 and should be covered in annex material for the 2013 Edition.
This is not original material; its reference/source is as follows:
ISO/TC 22393 Committee Draft (CD) Societal security – Guidelines for exercises and testing.