National Earthquake Technical Assistance Program (NETAP)

Toolkit for Earthquake Program Managers

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FEMA

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Background and Authorities

In accordance with the *Earthquake Hazards Reduction Act of 1977 (Public Law 95–124)* and the *National Earthquake Hazards Reduction Program (NEHRP) Reauthorization Act of 2004 (Public Law 108–360)*, it is FEMA's responsibility to support the implementation of a comprehensive earthquake education and public awareness program, including development of materials and their wide dissemination to all appropriate audiences and support public access to locality-specific information that may assist the public in reducing earthquake risk.

FEMA developed the **National Earthquake Technical Assistance Program (NETAP)** as a mechanism for delivering ***direct assistance*** to the public to increase their knowledge and ability to analyze their risk, make a plan, and take actions aimed at reducing their earthquake risk and supporting overall community resilience.

NETAP is **not** a grant or cooperative agreement program, but a *contract* managed by FEMA to rapidly deploy specific assistance to organizations and communities.

Eligible Applicants

NETAP is designed to help State, local, and tribal governments, non-profit, and private sector organizations obtain the knowledge, tools, and technical assistance needed for them to effectively implement local earthquake risk reduction initiatives.

Type of Assistance

- **Training**—Courses and associated materials, available for classroom presentation, webinar, or independent study, related to a variety of seismic risk-reduction activities and stakeholders. See *NETAP Training Courses & Associated Materials* on page 6 and *NETAP Course Flyers* beginning on page 11.

- **Technical assistance**—Technical advice and shared expertise that help local communities design, develop, and implement earthquake risk reduction projects.

- **Tools development**—Assistance in developing job aids and other tools that facilitate efficient and effective implementation of earthquake risk reduction efforts.

- **Special project support**—Support for local earthquake projects or other original, unique, or replicable earthquake risk reduction initiatives may be funded under the program. Support is dependent on funding availability and outcomes of the proposed project. The special project shall not only provide local benefits, but also potentially contribute or support national level NEHRP efforts (i.e., guidance development, standards, etc.).

Process for Obtaining Assistance

Training materials sought for independent study can be obtained free of charge through the online FEMA Library (http://www.fema.gov/plan/prevent/earthquake/publications.shtm), unless otherwise indicated in the course listings. Obtaining other NETAP assistance involves the following steps:

1. **Identify Need & Request Assistance**
   Eligible applicants shall provide requests in writing describing the type of assistance needed, purpose or objectives, scope (e.g., timing, location, estimated cost), and the primary points of contact. Requests should be prepared in consultation with the State Earthquake Program Manager or other State official with responsibility for earthquake risk reduction.

2. **Communicate Request**
   The State Earthquake Program Manager forwards the request to the appropriate FEMA Regional Earthquake Program Manager who in return works closely with the FEMA Headquarters NETAP Program Manager. Because NETAP is a national contract, immediate coordination with HQ is necessary to ensure timely planning and approval of the request.

3. **Review & Coordination**
   FEMA NETAP Program Manager in collaboration with the Regional Earthquake Program Manager reviews the request. A coordination conference call may be required between all parties to discuss and negotiate the details.

4. **Approval**
   Based on this review and coordination process, final decision is made by the FEMA NETAP Program Manager based on program funding and priorities, target outcomes of the request, and other relevant factors such as local earthquake risk, capacity of the requesting organization to execute the proposal in partnership with FEMA, how well the assistance aligns with local hazard mitigation plans, etc.

5. **Delivery**
   If approved, the NETAP Program Manager deploys approved contract resources in collaboration with the FEMA Regional and State Earthquake Program Managers *(and the requesting organization if it is not the State).*

   When the assistance provided consists of training courses presented to local groups, FEMA typically pays for the salary and travel expenses of an approved instructor as well as for any educational materials used by the students and instructor. The State or local government requesting the training, in cooperation with any partnering organizations, is responsible for local logistical requirements (e.g., classroom space, audiovisual equipment, refreshments, recruitment and registration of students).

   When providing tools-development, special-project, or technical assistance, FEMA

normally delivers or funds the delivery of some portion of the expertise or support required. The respective contributions of FEMA, State or local governments, and other involved organizations are established through ad hoc negotiations.

6. **Performance Reporting**
   Immediately after the successful implementation of the NETAP assistance, the State Earthquake Program Managers *(or requesting organization)* submits a written report on progress or final accomplishments. If it was a training, the contract instructor will collect evaluation forms from student participants and/or State or hosting organization.

NETAP Training Courses and Associated Materials

FEMA 154, Rapid Visual Screening of Buildings for Potential Seismic Hazards

Trainees learn how to identify potentially hazardous buildings before earthquakes occur. The course covers methods and processes that enable personnel to "rapidly" identify, inventory, and rank local buildings according to their expected safety and usability during and after earthquakes. Local officials can use these data to plan and prioritize further engineering and vulnerability analysis, emergency-response needs, and mitigation projects. (Course length: 1 day)

- ***FEMA 154 Handbook:*** http://www.fema.gov/library/viewRecord.do?id=3556
- ***FEMA 154 CD:*** http://www.fema.gov/library/viewRecord.do?id=3556
- ***FEMA 154 Editable Flyer:*** http://www.fema.gov/plan/prevent/earthquake/training_netap.shtm

FEMA 154, Rapid Visual Screening of Buildings for Potential Seismic Hazards and ATC-20, Postearthquake Safety Evaluation of Buildings

The FEMA 154 course, described above, may be combined with ATC-20 training, in which students learn how to evaluate the safety of buildings following earthquakes. ATC-20 trainees learn to perform seismic inspections and safety evaluations of buildings and post appropriate safety-status placards. These evaluations and placards can be used in planning and executing evacuation, re-entry, and rebuilding strategies. (Course length: 1 - 2 days)

- ***FEMA 154 Materials:*** See above
- ***ATC-20-1 Field Manual: Postearthquake Safety Evaluation of Buildings (Second Edition)*** may be ordered from***:*** *https://www.atcouncil.org/Postearthquake-Damage-and-Safety-Evaluation-of-Buildings/Field-Manual-Postearthquake-Safety-Evaluation-of-Buildings-Second-Edition/flypage.tpl.html?keyword=atc-20-1*
- ***FEMA 154 & ATC-20 Editable Flyer:*** http://www.fema.gov/plan/prevent/earthquake/training_netap.shtm

FEMA 154, Rapid Visual Screening of Buildings for Potential Seismic Hazards and Rapid Observation of Vulnerability and Estimation of Risk (ROVER)

The FEMA 154 course, described above, may be combined with ROVER training and demonstration assistance. ROVER is open-source software that automates the paper-based screening procedures taught in the FEMA 154 course. Building-specific data are entered into ROVER in the field via smartphones and GPS devices, and are aggregated in a PC-based data server. ROVER includes many productivity-enhancing features, such as automated geolocation, integrated digital photography and sketching capabilities, and automated retrieval of site-specific soil and hazard data from U.S. Geological Survey maps. (Course length: 1 day)

- ***FEMA 154 Materials:*** See above
- ***ROVER:*** *http://www.fema.gov/plan/prevent/earthquake/rover.shtm*
- ***FEMA 154 & ROVER Editable Flyer:*** http://www.fema.gov/plan/prevent/earthquake/training_netap.shtm

ATC-20, Postearthquake Safety Evaluation of Buildings and Rapid Observation of Vulnerability and Estimation of Risk (ROVER)

Requesters may be approved to receive ATC-20 training, without an accompanying FEMA 154 course, if the ATC-20 training is combined with ROVER training and use. ATC-20 and ROVER training and materials are described under courses listed above. (Course length: 1 day)

- ***ATC-20-1 Field Manual: Postearthquake Safety Evaluation of Buildings (Second Edition)*** may be ordered from*: https://www.atcouncil.org/Postearthquake-Damage-and-Safety-Evaluation-of-Buildings/Field-Manual-Postearthquake-Safety-Evaluation-of-Buildings-Second-Edition/flypage.tpl.html?keyword=atc-20-1*
- ***ROVER:*** *http://www.fema.gov/plan/prevent/earthquake/rover.shtm*
- ***ATC-20 & ROVER Editable Flyer:*** http://www.fema.gov/plan/prevent/earthquake/training_netap.shtm

FEMA E-74, Reducing the Risks of Nonstructural Earthquake Damage

This training describes the sources of nonstructural earthquake damage and effective methods of reducing such damage. Nonstructural failures have accounted for the majority of damage in several recent U.S. earthquakes. It is critical to raise awareness of potential nonstructural hazards, the costly consequences of nonstructural failures, and the opportunities that exist to limit future losses. Nonstructural components of buildings include all elements that are not part of the structural system; that is, the architectural, mechanical, electrical, and plumbing systems, as well as furniture, fixtures, equipment, and other contents. (Course length: ½ - 1 day)

- **E-74 Online:** http://www.fema.gov/plan/prevent/earthquake/fema74/index.shtm
- **E-74 Editable Flyer Template:** http://www.fema.gov/plan/prevent/earthquake/training_netap.shtm

FEMA P-593, Seismic Rehabilitation Training for One- and Two-Family Wood-Frame Dwellings

This training promotes seismic rehabilitation of one- and two-family homes to reduce earthquake damage and increase postearthquake habitability. Trainees are introduced to the effects of earthquakes on wood-frame dwellings, common seismic vulnerabilities in these structures, rehabilitation approaches, and available rehabilitation guidelines. (Course length: ½ - 1 day)

- **FEMA P-593CD:** http://www.fema.gov/library/viewRecord.do?id=4554
- **FEMA P-593 Editable Flyer Template:** http://www.fema.gov/plan/prevent/earthquake/training_netap.shtm

FEMA 395, Earthquake Safety and Mitigation for Schools

This is a webinar for school officials, teachers, facility managers, and other stakeholders interested in reducing earthquake risks in local schools. Numerous school buildings located in multiple States and U.S. territories are vulnerable to earthquake damage that threatens safety and continued operations. Attendees learn how to assess and analyze seismic risks; how to develop actionable plans for reducing and managing these risks; how to secure nonstructural elements of school facilities; and how to use “incremental seismic rehabilitation” as an affordable approach for protecting existing buildings and ensuring occupant safety. (Course length: 1 - 2 hours)

- **FEMA 395 Materials:** http://www.fema.gov/plan/prevent/rms/rmsp395.shtm
- **FEMA 395 Webinar:** http://www.fema.gov/goodbye/goodbye.jsp?url=https://fema.connectsolutions.com/p13135639/
- **FEMA 395 Editable Flyer Template:** http://www.fema.gov/plan/prevent/earthquake/training_netap.shtm

FEMA P-767, Earthquake Mitigation for Hospitals

Students are introduced to earthquake hazards in health care settings and learn about methods that can be used to analyze and reduce risks of damage in hospitals and other medical buildings. Such facilities have unique nonstructural components, including equipment and infrastructure systems that can become sources of injury or damage even during smaller earthquakes. By implementing sound, cost-effective mitigation measures, health care facilities can reduce or eliminate seismic risks and ensure that, in the event of an earthquake, they can remain in operation to serve their communities. (Course length: 1 day)

- **FEMA P-767:** http://www.fema.gov/library/viewRecord.do?id=4770
- **FEMA P-767 Editable Flyer Template:** http://www.fema.gov/plan/prevent/earthquake/training_netap.shtm

Other FEMA Earthquake-Related Training

For other earthquake-related training that may be funded under NETAP, visit page 23 of *FEMA P-736 Catalog of FEMA Earthquake Resources* at http://www.fema.gov/library/viewRecord.do?id=3538

NETAP Training Course Schedule

The NETAP training course schedule is available here:
https://www.fema.gov/plan/prevent/earthquake/netap_calendar.shtm

For more accurate schedule of pending and confirmed NETAP assistance, please contact the NETAP Program Manager.

Contact Information

NETAP Program Managers:

Claudette Fetterman
Senior Program Specialist
Email: Claudette.fetterman@dhs.gov
Office: 202-646-4344

Mike Mahoney (COTR)
Geophysicist
Email: mike.mahoney@dhs.gov
Office: 202-646-2794

Thomas McLane
Director of Business Development
Applied Technology Council (ATC)
Email: tmclane@atcouncil.org
Phone: 703-351-5052

Regional Earthquake Program Managers:
https://www.fema.gov/plan/prevent/earthquake/hq_regions.shtm#2

State Earthquake Program Managers:
https://www.fema.gov/plan/prevent/earthquake/State_contacts.shtm

Copies of NETAP Course Flyers

For electronic and editable versions, go to
http://www.fema.gov/plan/prevent/earthquake/training_netap.shtm

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[INSERT LOCAL OR OTHER PARTNER ORGANIZATIONAL LOGOS SPONSORING THIS TRAINING]

FEMA 154, Rapid Visual Screening of Buildings for Potential Seismic Hazards

COURSE DESCRIPTION:

Trainees learn how to identify potentially hazardous buildings before earthquakes occur. The course covers methods and processes that enable personnel to "rapidly" identify, inventory, and rank local buildings according to their expected safety and usability during and after earthquakes. Local officials can use these data to plan and prioritize further engineering and vulnerability analysis, emergency-response needs, and mitigation projects.

TARGET AUDIENCE: Building owners, facility managers, building officials, engineers, homeowners, emergency managers, and other interested citizens and volunteers.

GENERAL INFORMATION:

Time:	x:xx am – x:xx pm
Date:	Month, Day, Year
Location:	Facility Name, Room #, Street Address, City, State, Zip
Instructor:	Name, Title, Organization
Materials:	Course materials and/or CDs will be disseminated onsite.

REGISTRATION: To register, email your name, title, organization, address, and phone number to xxxxx@xxxx.com. For questions or additional information, contact xxx-xxx-xxxx.

AGENDA:

- Introduction
- Planning and Managing Rapid Visual Screening
- Completing the Data Collection Form
- Using the RVS Procedure Results
- Example Application of Rapid Visual Screening

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FEMA 154, Rapid Visual Screening of Buildings for Potential Seismic Hazards & Rapid Observation of Vulnerability and Estimation of Risk (ROVER)

COURSE DESCRIPTION: FEMA 154, *Rapid Visual Screening of Buildings for Potential Seismic Hazards*, provides training on how to identify potentially hazardous buildings before earthquakes occur. The course covers methods and processes that enable personnel to rapidly identify, inventory, and rank local buildings according to their expected safety and usability during and after earthquakes. Local officials can use these data to plan and prioritize further engineering and vulnerability analysis, emergency-response needs, and mitigation projects.

Rapid Observation of Vulnerability and Estimation of Risk (ROVER) is software that automates the paper-based screening procedures taught in FEMA 154 and ATC-20. Building-specific data are entered into ROVER in the field via smartphones and GPS devices, and are aggregated in a PC-based data server. ROVER features include automated geolocation, integrated digital photography and sketching capabilities, and automated retrieval of site-specific soil and hazard data from USGS maps.

TARGET AUDIENCE: Building officials, engineers, architects, building owners, emergency managers, risk analysts, and other interested citizens and volunteers.

GENERAL INFORMATION:

Time:	x:xx am – x:xx pm
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Materials:	Course materials and/or CDs will be disseminated onsite.

REGISTRATION: To register, email your name, title, organization, address, and phone number to xxxxx@xxxx.com. For questions or additional information, contact xxx-xxx-xxxx.

AGENDA:

- Introduction
- Planning and Managing Rapid Visual Screening
- Completing the Data Collection Form
- Using the RVS Procedure Results
- Example Application of Rapid Visual Screening
- ROVER Training

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FEMA 154, Rapid Visual Screening of Buildings for Potential Seismic Hazards & ATC-20, Postearthquake Safety Evaluation of Buildings

COURSE DESCRIPTION: FEMA 154, *Rapid Visual Screening of Buildings for Potential Seismic Hazards*, provides training on how to identify potentially hazardous buildings before earthquakes occur. The course covers methods and processes that enable personnel to rapidly identify, inventory, and rank local buildings according to their expected safety and usability during and after earthquakes. Local officials can use these data to plan and prioritize further engineering and vulnerability analysis, emergency-response needs, and mitigation projects.

ATC-20, *Postearthquake Safety Evaluation of Buildings*, provides training on rapid and detailed evaluation procedures for evaluating earthquake-damaged buildings and posting them as INSPECTED (apparently safe, green placard), LIMITED ENTRY (yellow placard), or UNSAFE (red placard). It provides examples which allow attendees to evaluate building damage conditions, assess the overall risk from the damage, and recommend which of the three placards should be posted on the building.

TARGET AUDIENCE: Building officials, engineers, architects, building owners, emergency managers, and other interested citizens and volunteers.

GENERAL INFORMATION:

Time:	x:xx am – x:xx pm
Date:	Month, Day, Year
Location:	Facility Name, Room #, Street Address, City, State, Zip
Instructor:	Name, Title, Organization
Materials:	Course materials and/or CDs will be disseminated onsite.

REGISTRATION: To register, email your name, title, organization, address, and phone number to xxxxx@xxxx.com. For questions or additional information, contact xxx-xxx-xxxx.

AGENDA:

FEMA 154

- Introduction
- Planning and Managing Rapid Visual Screening
- Completing the Data Collection Form
- Using the RVS Procedure Results
- Example Application of Rapid Visual Screening

ATC-20

- Introduction to ATC-20 Methodology
- Posting System
- Evaluation Procedures
- Structural Basics
- Wood Frame Structures
- Masonry Structures
- Concrete Structures
- Steel Frame Structures
- Nonstructural Elements
- Geotechnical Hazards
- Other Hazards - Wind and Flood
- Hazardous Materials
- Field Safety

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ATC-20, Postearthquake Safety Evaluation of Buildings & Rapid Observation of Vulnerability and Estimation of Risk (ROVER)

COURSE DESCRIPTION: ATC-20 teaches how to perform seismic inspections and safety evaluations of buildings and post appropriate safety-status placards. These evaluations and placards can be used in planning and executing evacuation, re-entry, and rebuilding strategies.

Rapid Observation of Vulnerability and Estimation of Risk (ROVER) is software that automates the paper based screening procedures taught in FEMA 154 and ATC-20. Building-specific data are entered into ROVER in the field via smartphones and GPS devices, and are aggregated in a PC-based data server. ROVER includes many productivity-enhancing features, such as automated geolocation, integrated digital photography and sketching capabilities, and automated retrieval of site-specific soil and hazard data from the U.S. Geological Survey Maps.

TARGET AUDIENCE: Building officials, engineers, architects, building owners, emergency managers, risk analysts, and other interested citizens and volunteers.

GENERAL INFORMATION:

Time:	x:xx am – x:xx pm
Date:	Month, Day, Year
Location:	Facility Name, Room #, Street Address, City, State, Zip
Instructor:	Name, Title, Organization
Materials:	Course materials and/or CDs will be disseminated onsite.

REGISTRATION: To register, email your name, title, organization, address, and phone number to xxxxx@xxxx.com. For questions or additional information, contact xxx-xxx-xxxx.

AGENDA:

ATC-20

- Introduction to ATC-20 Methodology
- Posting System
- Evaluation Procedures
- Structural Basics
- Wood Frame Structures
- Masonry Structures
- Concrete Structures
- Steel Frame Structures
- Nonstructural Elements
- Geotechnical Hazards
- Other Hazards - Wind and Flood
- Hazardous Materials
- Field Safety

ROVER

- Introduction
- Planning and Managing Rapid Visual Screening
- Completing the Data Collection Form
- Using the RVS Procedure Results
- Example Application of Rapid Visual Screening
- ROVER Training

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FEMA E-74, Reducing the Risks of Non-Structural Earthquake Damage

COURSE DESCRIPTION:

This training describes the sources of nonstructural earthquake damage and effective methods of reducing such damage. Nonstructural failures have accounted for the majority of damage in several recent U.S. earthquakes. It is critical to raise awareness of potential nonstructural hazards, the costly consequences of nonstructural failures, and the opportunities that exist to limit future losses. Nonstructural components of buildings include all elements that are not part of the structural system; that is, the architectural, mechanical, electrical, and plumbing systems, as well as furniture, fixtures, equipment, and other contents.

TARGET AUDIENCE: Building owners, facility managers, building officials, engineers, homeowners, and emergency managers.

GENERAL INFORMATION:

Time:	x:xx am – x:xx pm
Date:	Month, Day, Year
Location:	Facility Name, Room #, Street Address, City, State, Zip
Instructor:	Name, Title, Organization
Materials:	Course materials and/or CDs will be disseminated onsite.

REGISTRATION:

To register, email your name, title, organization, address, and phone numberto xxxxx@xxxx.com. For questions or additional information, contact xxx-xxx-xxxx.

AGENDA:

- Introduction
- PBehavior of Nonstructural Components
- Survey and Assessment Procedures for Existing Buildings
- Nonstructural Risk Reduction for Existing Buildings
- Nonstructural Risk Reduction for New Buildings
- Seismic Protection of Nonstructural Components

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[INSERT LOCAL OR OTHER PARTNER ORGANIZATIONAL LOGOS SPONSORING THIS TRAINING]

FEMA P-593, Seismic Rehabilitation Training for One- and Two-Family Wood-Frame Dwellings

COURSE DESCRIPTION: *Seismic Rehabilitation Training for One- and Two-Family Wood-Frame Dwellings*, FEMA P-593, promotes seismic rehabilitation of one- and two-family dwellings, in order to reduce earthquake damage losses and increase dwelling habitability following moderate to major earthquakes. This is done by introducing the trainee to the effects of earthquakes on wood-frame dwellings, identifying common vulnerabilities, and identifying rehabilitation approaches and available guidelines.

TARGET AUDIENCE: Contractors, building officials, engineers, architects, building owners, emergency managers, and other interested technical volunteers.

GENERAL INFORMATION:

Time:	x:xx am – x:xx pm
Date:	Month, Day, Year
Location:	Facility Name, Room #, Street Address, City, State, Zip
Instructor:	Name, Title, Organization
Materials:	Course materials and/or CDs will be disseminated onsite.

REGISTRATION: To register, email your name, title, organization, address, and phone number to xxxxx@xxxx.com. For questions or additional information, contact xxx-xxx-xxxx.

AGENDA:

- Introduction
- Earthquake Effects
- Seismic Rehabilitation Concepts
- Building Code Requirements
- Prescriptive Rehabilitation Plans
- Condition Survey
- Rehabilitation Construction Basics

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FEMA 395 Incremental Seismic Rehabilitation for Schools

Earthquake Safety and Mitigation for Schools

COURSE DESCRIPTION:

This is a webinar for school officials, teachers, facility managers, and other stakeholders interested in reducing earthquake risks in local schools. Numerous school buildings located in multiple States and U.S. territories are vulnerable to earthquake damage that threatens safety and continued operations. Attendees learn how to assess and analyze seismic risks; how to develop actionable plans for reducing and managing these risks; how to secure nonstructural elements of school facilities; and how to use "incremental seismic rehabilitation" as an affordable approach for protecting existing buildings and ensuring occupant safety.

TARGET AUDIENCE: School administrators, board members, facility managers, engineers, and other interested citizens or school safety stakeholders.

GENERAL INFORMATION:

Time:	x:xx am – x:xx pm
Date:	Month, Day, Year
Location:	Facility Name, Room #, Street Address, City, State Zip
Instructor:	Name, Title, Organization
Materials:	Course materials and/or CDs will be disseminated onsite.

REGISTRATION: To register, email your name, title, organization, address, and phone numberto xxxxx@xxxx.com. For questions or additional information, contact xxx-xxx-xxxx.

AGENDA:

- How to assess and analyze your earthquake risks
- How to develop an actionable plan to reduce and manage earthquake risks
- How to initiate an earthquake risk reduction plan for existing school buildings that were not designed and constructed to meet modern building codes
- How to secure "non-structural" elements of the school facility
- How to apply "incremental seismic rehabilitation" to protect buildings and ensure occupant safety
- Why "incremental seismic rehabilitation" is an affordable alternative for school safety

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FEMA P-767, Earthquake Mitigation for Hospitals

COURSE DESCRIPTION: Students are introduced to earthquake hazards in health care settings and learn about methods that can be used to analyze and reduce risks of damage in hospitals and other medical buildings. Such facilities have unique nonstructural components, including equipment and infrastructure systems that can become sources of injury or damage even during smaller earthquakes. By implementing sound, cost-effective mitigation measures, health care facilities can reduce seismic risks and ensure that, in the event of an earthquake, they can remain in operation to serve their communities.

TARGET AUDIENCE: Hospital facilities managers, engineers,administrators, and other hospital personnel.

GENERAL INFORMATION:

Time:	x:xx am – x:xx pm
Date:	Month, Day, Year
Location:	Facility Name, Room #, Street Address, City, State, Zip
Instructor:	Name, Title, Organization
Materials:	Course materials and/or CDs will be disseminated onsite.

REGISTRATION: To register, email your name, title, organization, address, and phone number to xxxxx@xxxx.com. For questions or additional information, contact xxx-xxx-xxxx.

AGENDA:

- Introduction: What is Seismic Risk for Hospital Facilities
- Regional Earthquake Hazard
- Building Structural Vulnerability to Earthquakes
- Building Nonstructural Vulnerability to Earthquakes
- Earthquake Performance Expectations - Postearthquake
- What can be done to Reduce Seismic Risk, Overview
- Planning and Managing the Process of Earthquake Risk Reduction in Existing Hospitals
- Structural Mitigation
- Nonstructural Mitigation
- Integration Opportunities for Structural and Nonstructural Mitigation
- Possible Mitigation Funding Sources