

## Unit 6

# Evaluating Your Community's Safety

### INTRODUCTION

Knowledge of earthquakes, earthquake forces, and improved building techniques has expanded rapidly over the past 20 years. In this course we have learned many techniques that can be used by communities to help protect themselves from the loss of life and damage due to seismic forces. The latest editions of the national model building codes incorporate all of this information and knowledge, and are substantially equivalent to the NEHRP *Provisions*. We know that a community can reduce its seismic risks if it adopts and enforces model building codes that include seismic provisions. Is your community doing all that it can to reduce its seismic risk?

Unit 6 answers the following questions:

- Do your community's local building codes comply with Executive Order 12699?
- How should your community go about adopting a model code?

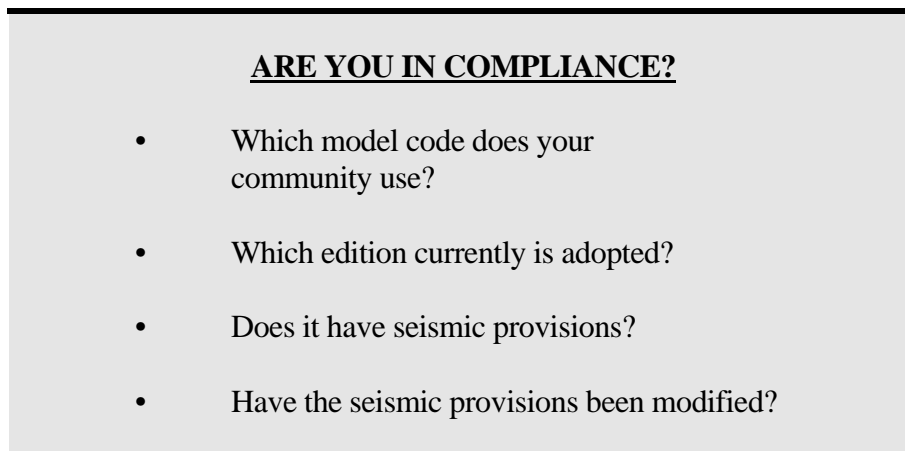
### **DO YOUR COMMUNITY'S LOCAL BUILDING CODES COMPLY WITH EXECUTIVE ORDER 12699?**

Federal agencies offering home loan guarantees, loans, and grants to States and counties for public buildings and construction of federally owned buildings are instructed by Executive Order 12699 to use local standards (or building codes) where appropriate codes are available. Besides increasing the safety of people and property, complying with Executive Order 12699 will allow your community to obtain Federal money for new construction. If your community uses the seismic provisions in the latest edition of a national model building code, you probably are already in compliance with the Executive Order.

Adopted in its entirety, a national model building code will include seismic provisions that cover all the requirements specified by the Order.

One of the keys to compliance is the use of a national model building code along with its seismic provisions. Adopting and enforcing a model building code makes it very easy for your community to show that it is in compliance with Executive Order 12699. Everyone who receives

Federal grants, or federally assisted or guaranteed financing for new building construction, must be in compliance with the Executive Order. To find out if your community is in compliance with Executive Order 12699, you will need to know the answers to the questions listed in Figure 6-1 below.



**Figure 6-1**

### **Which Building Code Is Your Community Using?**

As we have noted already, if your community is presently using a current version of a national model code that includes all the current seismic provisions, your community's building standards meet the requirements of Executive Order 12699.

But if your community's building code is:

- Not based on one of the national model codes, or
- Not current, or
- Adopted without seismic provisions . . .

members of your community may encounter delays or extra costs when applying for Federal grants or assistance. Each agency will set up its own criteria, standards, and procedures for determining if a building code satisfies its program requirements. Or they could require the applicant (your community) to certify that the code is equivalent. Whatever the case, this can be a long and tiresome process. If a Federal agency is looking for a site for new construction, this additional step in the process might cause the agency to look for a new community that already has a model building code in place. Loan and grant-giving agencies simply may not process applications until compliance can be verified. Can your community afford to wait for these loans?

### **What Should You Do If Your Community Doesn't Have Adequate Seismic Provisions?**

If your community does not have adequate seismic provisions, then to continue receiving Federal monies for new construction you will need to put in place:

- One of the national model building codes, with seismic provisions substantially equivalent to the NEHRP *Provisions*, or
- A building code with seismic provisions substantially equivalent to the NEHRP *Provisions*.

Preparing a building code to meet the Executive Order's requirements can be a long and technically difficult task involving a lot of people and money. Chances are that your community would not have the money, time, or expertise needed to develop an original building code.

Therefore, the easiest route for your community to take is to adopt a national model code with all seismic provisions.

National model codes already have been determined to meet the Executive Order's requirements. In fact, public debate over technical details already has been conducted at a national level. Adopting a model code also means there is no need for drafting an ordinance or conducting a legal review. Furthermore, the model code groups have worked very hard to prepare materials and support services for communities wishing to adopt their model code. These organizations can lead your community through the steps required to adopt their code and comply with Executive Order 12699.

The flow chart in Figure 6-2 on the following page shows a summary of the questions and action steps your community will need to take to ensure compliance with Executive Order 12699.

## **HOW SHOULD YOUR COMMUNITY GO ABOUT ADOPTING A MODEL CODE?**

The national model code organizations make it very easy for a community to adopt their codes. Each organization can give a community a sample ordinance that they can adopt or revise to fit local building conditions. They also can provide community officials with assistance during the adoption process.

Though a model building code can be modified to fit local conditions, any modifications must be done very carefully to ensure that a revision in one section does not interfere with another section's requirements. To meet Executive Order 12699's requirements, the seismic component of the model code must be substantially equivalent to the most recent, or immediately preceding, version of the NEHRP *Provisions*.

It also is essential to establish a process for *updating* your community's code on a regular basis. That way, when the model code organization issues a provision, there is a clear cut process for updating your building code. Some communities include a provision in the ordinance that automatically updates the building code to the newest version when it is released.

The NEHRP *Provisions* and the national model building codes are periodically updated to ensure that the lessons learned from earthquakes are incorporated so that seismic risk reduction techniques can improve over time.

If your community already has adopted a model building code that is not up-to-date, you may need only to update your code by adopting the most recent version and the seismic provisions.

### **What Is Your Community's Adoption Process?**

Each community will vary in its specific adoption procedures. However, most communities follow a similar process. Once an ordinance calling for adoption of a building code is introduced, it usually is assigned to a committee that conducts a public hearing. Supporters of the ordinance must present clear and concise arguments showing why the ordinance is necessary. If the committee recommends the ordinance be passed, the ordinance is brought before the governing body for debate. Once adopted, an ordinance becomes effective after publication of an official notice. Finally, it is assigned to a department for implementation and enforcement.

You can see from this brief description of the adoption process how important public support can be to the success of the adoption efforts. Many people must be convinced that adopting a new building code will benefit the community. In Unit 2 you made a list of community leaders that need to know about Executive Order 12699. These same leaders must be strong supporters of adopting a model code and be able to convince others of its necessity.

Figure 6-3 contains some common arguments you may encounter and responses you can use to support adoption of seismic provisions.

### **Building Code Enforcement**

Building code adoption is a community's essential first step toward seismic safety and compliance with Executive Order 12699. However, enforcement of building codes is also essential if the community is to benefit from their adoption. The enforcement process varies from

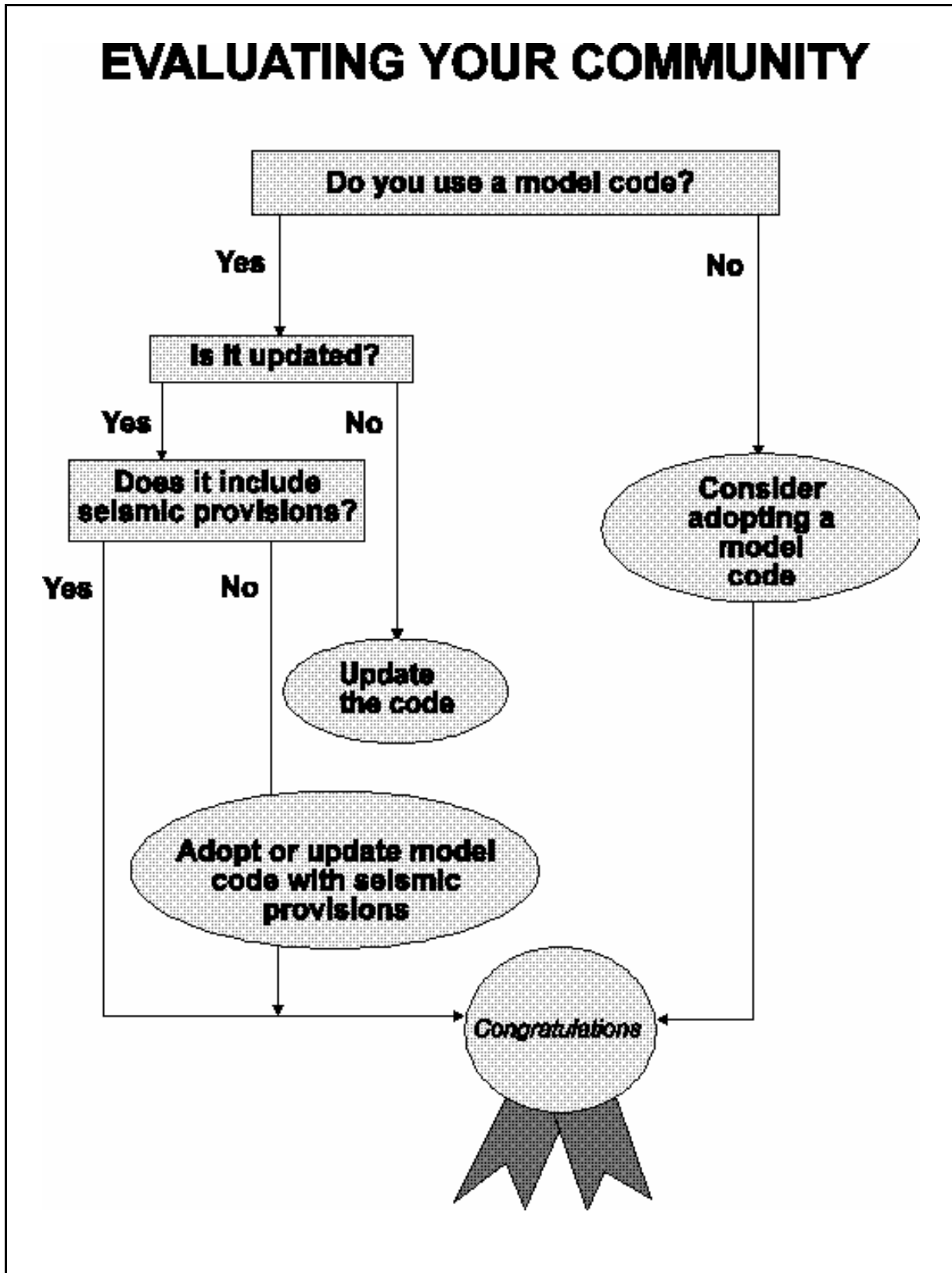


Figure 6-2

State to State. Either the State government or local government is the enforcement authority, but the process is generally the same. There are usually two steps: (a) plan review and (b) construction inspection.

Plan review involves requiring the builder to submit building plans to the local or State building department for review and approval. The building department can approve, require revisions, or reject the plans based on the plan's conformance with the building code. The building department does not issue a permit to begin construction until the plans conform to the building code.

The building department also periodically inspects the construction in progress. The inspections coincide with prescribed stages in the construction. If the inspector discovers a code violation, a stop work order is issued and construction is halted. The order remains in effect until the violation is corrected and a reinspection verifies the correction. Upon successful completion of the final inspection for habitability, an occupancy certificate is issued to the builder.

The construction permit, the stop work order, and the occupancy certificate are the principal enforcement tools of the building department. Code violations occur for a variety of reasons, such as lack of knowledge about applying the codes or poor construction practices. The three model code groups can provide information and training in applying building codes.

## **UNIT 6 - SUMMARY**

This unit explored ways your community can ensure its compliance with Executive Order 12699. In this unit we examined the following questions:

- Do your community's local building codes comply with Executive Order 12699?
  - Which building code is your community using?
  - What should you do if your community doesn't have adequate seismic provisions?
- How should your community go about adopting a model code?

- What is your community's adoption process?



### ARGUMENTS AND RESPONSES

**Argument:** "Seismic codes will burden our business."

**Response:** Codes won't hurt business – most States and almost 95 percent of all cities and towns in the United States already use building codes. There is no evidence that businesses have suffered in these States and cities, and there is little reason to believe that others will.

**Argument:** "What will seismic provisions really do for us, anyway?"

**Response:** A seismic code will save lives. Buildings designed and constructed in accordance with up-to-date seismic provisions are less likely to collapse and kill or injure people during an earthquake. Building codes work. Compare the result of the earthquake in Armenia in 1988 with the earthquake in California in 1989.

**Argument:** "We shouldn't spend any extra money if we are not going to profit from it."

**Response:** There are economic benefits to adopting a seismic code. Adopting the most recent version of a national model building code will make it easier for local governments to qualify for Federal loans and grants, for citizens to qualify for federally insured new home loans, and for small business loans for new construction. Executive Order 12699 requires that new building construction even partially financed with Federal grants or federally insured loans must meet existing seismic safety standards. It is easiest to comply with the Executive Order if local building codes already are equivalent to existing seismic standards, as defined by NEHRP *Recommended Provisions for Seismic Safety in New Buildings*. Project developers could incur additional consulting and design costs, as well as project delays, if local codes are insufficient to meet the NEHRP *Provisions*. Individual Federal agencies administering grant and loan programs set the guidelines for compliance with the Executive Order. The Executive Order encourages Federal agencies to use local building codes if they are substantially equivalent to the current NEHRP *Provisions*.

Figure 6-3

**Argument:** "It is too hard to develop seismic codes; we don't know how."

**Response:** It's easy. Communities can use the NEHRP *Provisions* and national model building codes to frame their own building codes. Besides, it is much easier to adopt seismic provisions and prepare a community than to endure a long recovery period.

**Argument:** "We don't have earthquakes; we have floods (or tornadoes, etc.). Why prepare for earthquakes?"

**Response:** The risk from earthquakes is more widespread and immediate than many people think—more than 40 of the 50 States have a moderate or higher earthquake hazard. The Northeast suffered significant earthquakes in the 17th century; the central United States suffered the worst known series of earthquakes in U.S. history in 1811 and 1812; Charleston, South Carolina suffered a devastating earthquake in 1886 that killed 60 people. Geologically speaking, these are recent events, which will very probably occur again. In the cases of Northeast and Charleston, scientists cannot determine the precise cause of the quakes. Both of these areas, like most of the rest of the United States, continue to experience small earthquakes that confirm these areas to be seismically active. Also, buildings constructed to resist damage from earthquakes will suffer less damage from most other natural hazards.

**Argument:** "Why should we build for earthquakes and incur the expenses if one is not likely to occur?"

**Response:** All communities need a seismic code regardless of the level of hazard. The NEHRP *Provisions* acknowledge that different communities have different levels of hazard. Building codes are designed to accommodate the probable ground shaking in any given geographic area of the United States. For example, applying the same model building code, a residence built in California would have greater structural seismic reinforcement requirements than a similar residence built in Florida.

**Argument:** (An elected official): "I don't think an earthquake will happen while I am in office. Let someone else worry about developing building codes with seismic provisions."

**Response:** A damaging earthquake can occur anytime, and there is plenty of evidence to support this. Nearly 75 percent of the nation has a history of earthquakes. The Federal Government has set a standard requirement with Executive Order 12699 for an effective Federal safety program. A recommended standard for seismic safety also has been developed by NEHRP. It is up to States and local governments to implement the standard through the adoption of the model building codes. Letting "someone else" worry about earthquakes and delaying the adoption of model building codes perpetuates the construction of unsafe buildings. Allowing buildings to be constructed without seismic provisions while you are in office means that they are more likely to collapse and cause deaths and injuries during a future earthquake. Adopting a model building code, with its seismic provisions, will begin a legacy of building safety that will be a credit to your public service.

Figure 6-3 *continued*

## Unit 6

# Evaluating Your Community's Safety

## Unit Review

Directions: For each question, circle the letter of the correct response and check your answers with the Answer Guide at the end of the unit.

1. What is the clearest indication that your community can meet the requirements of the Executive Order 12699?
  - a. An earthquake occurred in recent years causing no injuries and little damage.
  - b. Scientists say that your community is at low risk for earthquakes.
  - c. The community has adopted a recent version of one of the model building codes, including its seismic provisions.
  - d. The community has had building codes in effect for many years, so most buildings have been built to be safe.
  
2. Besides adopting a model code, what is another way a community might comply with the Executive Order?
  - a. They can have their community evaluated for seismic safety.
  - b. They may update the model code they are using to a more recent version that includes seismic provisions.
  - c. They can forbid any new construction in the community.
  - d. There are no other options.
  
3. If you do not have a building code with seismic provisions, which of the following questions should you consider?
  - a. Can we update our existing building code to include seismic provisions?
  - b. Can we adopt a recent model building code including its seismic provisions?
  - c. Should we develop our own building code and seismic provisions?

- d. all of the above.
4. To mount a campaign aimed at getting your community to adopt a new building code with seismic provisions, start by talking with:
- a. professional and labor organizations that may be affected.
  - b. local government officials who would be involved in decisionmaking.
  - c. individual business owners in the building community.
  - d. all of the above.
5. What are some common questions or concerns people might have about adopting a model code with seismic provisions?
- a. The increased costs associated with seismic codes will burden our business.
  - b. Providing for earthquake preparedness will increase building costs substantially.
  - c. We don't have earthquakes; we have floods. Why prepare for earthquakes?
  - d. Why should we build for earthquakes and incur the expense if one is not likely to occur?
  - e. all of the above.

## Unit 6

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## Unit Review - Answer Guide

1. What is the clearest indication that your community can meet the requirements of Executive Order 12699?
  - c. The community has adopted a recent version of one of the model building codes, including its seismic provisions.  
Reference: p. 6-2
2. Besides adopting a model code, what is another way a community might comply with the Executive Order?
  - b. They may update the model code they are using to a more recent version that includes seismic provisions.  
Reference: p. 6-6
3. If you do not have a building code with seismic provisions, which of the following questions should you consider?
  - d. all of the above.  
Reference: pp. 6-3 and 6-4
4. To mount a campaign aimed at getting your community to adopt a new building code with seismic provisions, start by talking with:
  - d. all of the above.  
Reference: p. 6-5, Unit 2

5. What are some common questions or concerns people might have about adopting a model code with seismic provisions?

e. all of the above.

Reference: pp. 6-8 and 6-9