

Unit 2

Executive Order 12699

INTRODUCTION

In the last unit, we looked at some of the earthquakes that have occurred in our nation's history. In this unit, we will take a detailed look at the history and intent of Executive Order 12699.

Unit 2 answers the following questions:

- What is the history of Seismic Safety Legislation?
- What is the purpose of Executive Order 12699?
- What does Executive Order 12699 require?
- How are Federal agencies affected by Executive Order 12699?
- If you are not a part of the Federal community, how does Executive Order 12699 affect you?

WHAT IS THE HISTORY OF SEISMIC SAFETY LEGISLATION?

This section will discuss some of the historical events that led to Executive Order 12699.

Legislative History

Very few earth scientists were monitoring earthquake activity before the 1960s. During that decade, the Nuclear Regulatory Commission's seismology projects increased the number of earth scientists and earthquake engineers operating in the United States. By the time of the 1964 Alaskan earthquake, a substantial number of trained specialists were available to take measurements and record this event. The Alaskan earthquake has been called one of the most violent earthquakes of all time. It registered XI (11) on the Modified Mercalli Intensity Scale (maximum 12) and, although Alaska is a largely rural state, the quake caused 114 deaths and more than \$311 million in property damage.

After the Alaskan earthquake, President Lyndon Johnson asked the National Academy of Sciences to conduct a comprehensive study of earthquakes and their effects on the natural and built environments. This project mobilized many researchers from various disciplines. Because of this study, the Alaskan earthquake is one of the best-documented in United States history. Research into the quake led to a series of efforts to develop risk reduction measures and identify future research needs. Also after the earthquake, scientists conducted notable work on earthquake prediction, but, even today, earthquake prediction is an inexact science.

Although the Alaskan earthquake spurred significant research, no national legislation was passed to protect the built environment. In February 1971, however, Congress took action. A moderate earthquake measuring VIII-XI on the Modified Mercalli Intensity Scale struck near San Fernando, California, and caused more than \$500 million in property damage in the Los Angeles area. The significant damage in a large metropolitan area caused by this earthquake spurred a series of congressional hearings, the introduction of bills to expand the nation's support of earthquake research, and extensive post-earthquake studies. Many began to realize that even *infrequent* moderate seismic events could have devastating effects on an area's schools, hospitals, businesses, homes, and economy.

Many of the bills introduced in response to the 1971 earthquake focused on prediction, but, as they were continually defeated, the scope of the bills was expanded to include education, development of emergency services and seismically resistant construction methods, and creation of reconstruction plans. Effective legislation was impeded by the belief that earthquakes troubled only California and other Western States. Opponents of the legislation believed that only those States affected by earthquakes should conduct earthquake research and pass legislation.

For several years, States passed their own legislation. In 1975 and 1976, however, several critical events occurred that sped up passage of the first earthquake bill to apply to all States. These events were:

- Release of new research indicating that all 50 States have *some* potential for seismic activity,
- Occurrence of several devastating earthquakes around the world, and
- Successful prediction of an earthquake in China.

Earthquake Hazards Reduction Act of 1977

These events and the support of the administration and legislative leaders eventually led to the passage of the Earthquake Hazards Reduction Act of 1977. The act mandated the establishment and maintenance of the National Earthquake Hazards Reduction Program (NEHRP) to effectively reduce the risks to life and property from future earthquakes.

The objectives of NEHRP are:

1. To develop technologically and economically feasible design and construction methods and procedures to make new and existing structures in areas of seismic risk earthquake resistant, giving priority to the development of methods and procedures for power generating plants, dams, hospitals, schools, public utilities, public safety structures, high occupancy buildings, and other structures that are especially needed in time of disaster;
2. To implement, to the greatest extent practicable, in all areas of very high to moderate seismic risk, a system using personnel, technology, and procedures to predict earthquakes and identify, evaluate, and accurately characterize seismic hazards;
3. To develop, publish, and promote, in conjunction with State and local officials and professional organizations, model building codes and to develop means to assess seismic risk and encourage the use of risk information in making land-use policy decisions and building construction activity;
4. To develop improved understanding of and capability with respect to earthquake-related issues, including methods of damage control and prevention, dissemination of earthquake alerts, organization of emergency services, and planning for reconstruction and redevelopment after an earthquake;
5. To educate the public, State and local officials, and members of private industry about earthquakes, to identify locations and structures that are especially susceptible to earthquake damage, to develop methods for reducing the adverse consequences of an earthquake, and related matters;
6. To develop research on:
 - Ways to increase the use of existing scientific and engineering knowledge to mitigate earthquake hazards; and

- Ways to assure the availability of earthquake insurance or some functional substitute.

Early activities under NEHRP addressed more effective building construction techniques. In the 1980s, NEHRP began producing a report titled *Recommended Provisions for the Development of Seismic Regulations for New Buildings* (commonly referred to as the *NEHRP Provisions*), which synthesized all the lessons learned from past seismic events and the most recent research and developed a national approach to seismic design. Previously, there had been a large body of information available for high-risk areas, but not much for moderate- or moderately high-risk areas. The *NEHRP Provisions* gave rational guidance for areas of moderate seismic risk.*

In 1980, the Interagency Committee on Seismic Safety in Construction (ICSSC) was formed as an interagency group for discussion of construction and seismic safety issues. Soon after the ICSSC was formed, its members began to focus on encouraging Federal agencies to adopt the provisions set forth by NEHRP. Toward this end, the ICSSC drafted Executive Order 12699.

History of Executive Order 12699

Executive Order 12699 was drafted to cover all Federal agencies and Federal programs and to include consideration of existing buildings and lifelines, as well as new construction. To gain approval from the Office of Management and Budget (OMB), the ICSSC had to show that the costs of the Executive Order would not be burdensome. The ICSSC showed that there would be only a 1-to-2-percent increase in Federal costs if seismic provisions for *new* building construction were mandated. Estimating the financial impact on the Federal Government for application of the provisions to existing buildings and lifelines, however, was much more difficult. Because no estimate could be made, the mandate for seismic requirements was revised to cover only new building construction. President George Bush signed the Executive Order on January 5, 1990.

*This document continues to be updated triennially, and the latest version is the 2003 edition (FEMA 450). The *NEHRP Provisions* serve as the basis for the seismic requirements of the nation's model building codes (such as the International Building Code [IBC]) and construction standards (such as ASCE 7).

WHAT IS THE PURPOSE OF EXECUTIVE ORDER 12699?

The full text of Executive Order 12699 is included in Appendix B. The following discussion highlights some of its key points:

The President issues an executive order to impose regulations on the Federal community. An executive order may also influence the adoption of certain requirements by State and local governments and private-sector organizations. Even if an executive order directly affects only the Federal community, State and local governments and the private sector should be familiar with it because they often are involved in fulfilling executive orders. Because Executive Order 12699 affects federally financed construction and federally insured loans, it is of concern to the commercial and residential construction industry.

The purpose of Executive Order 12699 is presented in two sections that separately address federally owned and federally leased, assisted, and regulated buildings. Section 1 addresses federally *owned* buildings—buildings purchased by the Federal Government. It says:

The purposes of these requirements are to reduce risks to the lives of occupants of buildings owned by the Federal Government and to persons who would be affected by the failures of Federal buildings in earthquakes, to improve the capability of essential Federal buildings to function during or after an earthquake, and to reduce earthquake losses of public buildings, all in a cost-effective manner.

Executive Order 12699, Section 1

Section 2 addresses the purpose of the order for federally *leased, assisted, and regulated* buildings:

The purposes of these requirements are to reduce risks to the lives of occupants of buildings leased for Federal uses or purchased or constructed with Federal assistance, to reduce risks to the lives of persons who would be affected by earthquake failures of Federally assisted or regulated buildings, and to protect public investments, all in a cost-effective manner.

Executive Order 12699, Section 2

WHAT DOES EXECUTIVE ORDER 12699 REQUIRE?

The very nature of an executive order makes it clear that the Federal community must prepare procedures and regulations necessary for compliance with the Order. It may not be as clear how much the order affects others. It is not our intention here to review the steps that are being taken by each Federal agency to comply with Executive Order 12699, but rather to focus on how this Order might affect those outside of the Federal community. Generally, this involves State and local governments and private organizations that may be involved with buildings *assisted, leased, or regulated* by the Federal Government.

What do we mean by assisted, leased, and regulated?***Assisted***

This refers to direct Federal financing such as grants and loans and federally insured financing such as Federal Housing Administration (FHA) or Department of Veterans Affairs (VA) loans. The Executive Order applies to federally assisted construction of new buildings and additions to existing buildings. Federally assisted new construction will have the biggest effect on the State and local community. Many people in the State and local community must be aware of the seismic provisions specified in the Executive Order to ensure receipt of Federal funds. For example, all new construction projects using VA or FHA loans or Federal grant funds must meet the seismic provisions specified in Executive Order 12699.

Builders aren't the only ones affected by these provisions. Let's say a group of investors decides to build a moderately-priced housing development in their community. They want to attract as many buyers as possible, so they need to ensure that every financing option is available to their potential buyers. If the homes that buyers hope to purchase have not been built according to appropriate seismic provisions, the buyers will not be able to acquire FHA or VA loans. Community centers, schools, libraries, nursing homes, fire stations, and many others often receive funds from various Federal agencies, including the U.S. Department of Housing and Urban Development (HUD), Department of Education, and U.S. Department of Health and Human Services (HHS). State and local officials must make sure that all seismic provisions have been adhered to—from design to completion.

Leased

This term refers to any new building or addition in which the Federal Government leases at least 15 percent of the space available. This means that if a builder in your community plans to construct a building that will be rented in part by a Federal agency, the building must be constructed to reduce the risk of loss of life and to prevent property damage in an earthquake. The requirement covers all leased buildings for which plans were developed after February 1, 1993. The Federal agency leasing the building will require that the owner provide verification of the building's seismic safety.

Regulated

This term refers to any new construction that will be regulated for structural safety by the Federal Government. For example, HUD regulates safety issues concerning manufactured (mobile) homes.

What Does "Cost-Effective" Mean?

Making a building completely seismically safe or designing a building that will not be damaged in an earthquake is technically difficult and economically prohibitive. The ICSSC recognized this fact in drafting Executive Order 12699 and included a "cost-effective" clause. This clause says that a building should be designed to prevent *collapse*, not damage. Designing a building to prevent collapse will reduce the loss of life in an earthquake, but does not necessarily eliminate damage to the building. In a severe earthquake, a seismically safe building built under the "cost-effective" clause may not collapse and kill or injure its inhabitants, but it may be so badly damaged that it must be demolished.

What Other Federal Requirements Need To Be Considered?

Section 3 of Executive Order 12699 addresses other Federal requirements that relate to the issues addressed here. Two of these requirements are discussed below:

First, Section 3 refers to the Robert T. Stafford Disaster Relief and Emergency Assistance Act, which provides programs for Federal disaster response and recovery assistance.

Executive Order 12699 requires that any *permanent structures* rebuilt after a disaster and using Federal funds through the Stafford Act abide by the Executive Order's provisions. This means that, following a Presidential disaster declaration, all reconstructed buildings using Stafford Act funds must meet the seismic safety standards of one of the three model

building codes, which will be discussed later. (However, the Executive Order does not require *temporary* emergency work to abide by its provisions.)

In the Federal Emergency Management Agency (FEMA) Public Assistance Program, the Executive Order also applies to new construction for an alternate project or an improved project, as well as for replacement of a damaged or destroyed facility. New construction funded by FEMA or any Federal grant programs also must be built to meet the seismic safety requirements of Executive Order 12699.

Second, OMB Circular A-119, “Federal Participation in the Development and Use of Voluntary Standards”, requires that Federal agencies adopt nationally recognized standards where they are available. To accommodate Circular A-119, Executive Order 12699 allows Federal agencies to use local standards where adequate building codes exist. Therefore, federally assisted new building construction, in communities whose local codes have adequate seismic provisions, will satisfy Executive Order regulations by adhering to those local codes. Later in this course, we will explore evaluation of local building codes to meet Executive Order 12699 requirements in greater detail.

Executive Order 12699 further states that Federal agencies that already have adopted safety levels higher than those imposed by this Order may maintain current regulations. Furthermore, an agency may adopt more stringent regulations if it chooses.

When Did Executive Order 12699 Go Into Effect?

Section 4 of Executive Order 12699 specifies that agencies have 3 years from the time the Executive Order was issued to comply. Since the Order was signed on January 5, 1990, all agencies were to have had all regulations and procedures in place by February 1, 1993.

HOW ARE FEDERAL AGENCIES AFFECTED BY EXECUTIVE ORDER 12699?

The Executive Order applies to all Federal agencies that:

- Assist in the financing of newly constructed buildings through grants or loans;
- Guarantee the financing of newly constructed buildings through loan or mortgage insurance programs;
- Construct and lease new buildings for Federal use;

- Design and construct new federally owned buildings;
- Regulate structural safety of new buildings; and
- Lease space in privately owned buildings.

Because agencies establish their own compliance procedures, each agency's approach will be a little different. This means that, if a builder in your community is constructing a building with assistance from a Federal agency, the building must be built to the particular agency's specifications, even if the building codes used in your community are different. Again, Executive Order 12699 allows Federal agencies to use local private-sector standards and practices, unless the agency finds that none are available to meet Executive Order requirements. The agency must evaluate the adequacy of these standards and practices before adopting them for a project.

The ICSSC developed NEHRP's *Recommended Provisions for the Development of Seismic Regulations for New Buildings* as a set of nationally applicable seismic safety guidelines to be used by model code institutions and legislative bodies to establish seismic standards. The minimum standards adopted by Federal agencies must be equivalent or superior to the standards and practices outlined in the NEHRP *Provisions*. The ICSSC periodically evaluates up-to-date national model building codes to determine whether they are substantially equivalent to the most recent or immediately preceding edition of the NEHRP *Provisions*. The ICSSC's latest evaluations are available on the National Institute of Standards and Technology (NIST) website at www.nist.gov.

IF YOU ARE NOT A PART OF THE FEDERAL COMMUNITY, HOW DOES EXECUTIVE ORDER 12699 AFFECT YOU?

Many groups in State and local governments must know and be able to institute the seismic safety standards required by Executive Order 12699. Any time someone from your community is involved in new construction that will be financed or financially assisted, owned, or leased by the Federal Government, seismic provisions must be taken into account. If your community has adopted one of the building codes recommended by the ICSSC, an important requirement of the Executive Order will be met. If the community has its own local building code, the officials cannot assume that existing codes are substantially equivalent to the NEHRP *Provisions*.

In addition, your community also must be aware of the seismic provisions required by specific Federal agencies. For example, the Department of Transportation (DOT) has chosen to adopt the seismic provisions outlined in substantially equivalent national model codes. DOT's requirements specifically state that certificates of compliance with the NEHRP *Provisions* for seismic design and construction must be received before acceptance of a new building. To verify compliance, DOT must receive verification from the architect or engineer, construction observation reports, State or local building department plan review documentation, or other documents. Other agencies, like the Nuclear Regulatory Commission, may decide they require much more stringent seismic standards for any new construction they may own, assist, or lease. Because agencies can choose the seismic provisions they will follow, anyone involved in construction in your community must be familiar with the relevant agency's documentation and compliance requirements procedures.

Those responsible for obtaining federally assisted financing for new construction must make sure that they have met the requirements of the specific Federal agency responsible for financing the new construction. For example, a community that needs a new school can apply to the Department of Education for financial assistance. Receiving this assistance means that the new construction must comply with the Department of Education's regulations for fulfilling the Executive Order. This means that the school board, city manager, or whoever is involved in the initial decision to build the new school must be aware of the Executive Order's requirements and the procedures required by the Department of Education to document compliance. Complying with the Executive Order and agency requirements might involve a signed statement attesting to the use of a specific building code, or the planners may choose to hire a consultant knowledgeable in seismic design to examine the work done. To make sure that all requirements are met, community leaders must know what needs to be done at the very beginning of the project and be familiar with the particular Federal agency requirements.

Communities that have adopted and are enforcing national model building codes that are substantively equivalent to the most current or immediately preceding NEHRP *Provisions* will be in a better position to comply with the requirements for obtaining Federal grants and loans. This could save local governments time and money. If your community already has a mechanism for inspecting building plans and new construction, according to a model building code, complying with the Executive Order and a specific agency's requirements may mean little additional work. If, on the other hand, your community must make special

arrangements to comply with the Executive Order's requirements, that could mean a delay in application for the loan or an increase in project costs.

State and local officials involved in securing Federal funds for community projects, such as schools, libraries, or recreational facilities, must be aware of the seismic provisions that must be followed to receive these funds. The earlier seismic design is factored into a new construction plan, the more cost-effective the design will be. It is much easier to plan for seismic safety during the design phase than to try to retrofit an existing plan with a seismically safe design.

Lenders also must know the regulations in Executive Order 12699. They must be aware that FHA and VA insured loans can be used only to purchase new buildings that are seismically resistant for the areas in which they are built. The lenders may be required to inform the construction industry and investors of their need to comply with the Executive Order in order to receive Federal funds.

Architects and engineers must be aware of the seismic provisions to which they must adhere during the planning and design phases of new construction projects. Designing a seismically safe building usually increases the cost of the building very little. Trying to modify a design after it is completed to incorporate seismic provisions can increase the cost of a project dramatically.

Zoning and land-use officials should be aware of how a particular site may be affected by an earthquake. When involved in planning new construction sites or changing zoning regulations, they must take into account an earthquake's potential effects on the natural environment. For example, these officials must approve or reject plans to build on a particular site based upon its response to potential earthquake-related natural disasters, such as landslides, liquefaction, amplification of ground movement, tsunamis, and seiches. (These effects of earthquakes on the natural environment are covered in greater detail in Unit 4.)

Local building code officials also should be familiar with Executive Order 12699. They may be required to enforce compliance with the Executive Order even though their community has not yet adopted seismic provisions in its local building codes. If local building codes do not have up-to-date provisions for seismic safety for new structures built with Federal funds, building codes specified by the funding agency must be used. (Most agencies use the model building codes recommended by the ICSSC.) Local building code officials also are

responsible for inspecting new buildings constructed with Federal funds, so they must understand the seismic provisions in Executive Order 12699.

Government and nongovernment organizations receiving Federal grant funds for new construction or addition projects must be able to verify that their new buildings will be constructed according to appropriate seismic provisions.

All new construction projects involve a long line of people that help turn building plans into a reality. If Federal funds are used for *any* part of a project, several people may have responsibility to make sure that all of the Executive Order's requirements and appropriate seismic provisions are satisfied. A project will be completed successfully if:

- Decisionmakers and developers plan the project with seismic provisions in mind,
- Architects and engineers design the structure taking seismic factors into account,
- The lender is assured that all seismic provisions have been incorporated,
- Land-use officials review site selection to ensure conformity with seismic requirements,
- Engineers and construction personnel adhere to seismic construction techniques, and
- Building code officials inspect to ensure seismic provisions have been incorporated.

As with many other Federal guidelines and regulations, it is the Federal Government that specifies the steps to be taken to comply, but it is the responsibility of the officials in every community to see to it that buildings meet Executive Order 12699's requirements for seismic safety. The more that people in local government, on planning committees, and in the construction industry (including inspection) are aware of these requirements to incorporate seismic design and construction features into new buildings and additions, the more likely the goals of Executive Order 12699 will be achieved.

Before you go onto the next unit, take some time to complete the chart in Figure 2-1, titled "Action Plan: People Who Need To Be Aware of Executive Order 12699 and Its Effects on Our Community." To complete the chart:

- List the names and positions of all the people in your community who plan for the use of Federal funds. This list might include the school board, chamber of commerce, property developers, or community leaders.
- Next, add other people in the community who would be involved in completing a project funded with Federal monies. These individuals might include architects, lenders, and land-use officials.
- Finally, list any ideas you have on how to make sure all of these people will become aware of how Executive Order 12699 will affect your community. If you are not in a position to influence these people, who is? How can you be sure that the right people have the information needed to make wise decisions about your community's future?

This list will help you identify the people that need information about Executive Order 12699 and brainstorm ideas for providing this information to them. After you have completed this course, come back to this list again. You may have some new names or ideas to add to the list.

UNIT 2 - SUMMARY

The purpose of this unit was to examine the history of Executive Order 12699 and its intent.

In this unit, we covered:

- What is the history of Seismic Safety Legislation?
 - Legislative History
 - Earthquake Hazards Reduction Act of 1977
 - History of Executive Order 12699
- What is the purpose of Executive Order 12699?
- What does Executive Order 12699 require?
 - What do we mean by assisted, leased, and regulated?
 - What does “cost-effective” mean?
 - What other Federal requirements need to be considered?
 - When did Executive Order 12699 go into effect?
- How are Federal agencies affected by Executive Order 12699?
- If you are not a part of the Federal community, how does Executive Order 12699 affect you?
 - Action Plan: People Who Need To Be Aware of Executive Order 12699 and Its Effects on Our Community

Unit 2

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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. Which earthquake has been called one of the most violent earthquakes of all time and became one of the best-documented earthquakes in the United States?
 - a. 1971 San Fernando
 - b. 1811 New Madrid
 - c. 1964 Alaska
 - d. 1979 Southeastern Alaska

2. What agency contributed to the increase in the number of earth scientists and earthquake engineers available in the 1960s?
 - a. Nuclear Regulatory Commission
 - b. Federal Emergency Management Agency
 - c. Environmental Protection Agency
 - d. Department of the Interior

3. Scientists no longer consider earthquake prediction a worthwhile line of research. True or false?
 - a. True
 - b. False

4. Why did a moderate earthquake like the 1971 San Fernando earthquake have such a big effect on the U.S. Congress?
 - a. It occurred outside of the area typically identified with seismic activity.
 - b. It was successfully predicted.
 - c. Much of the destruction was due to tsunamis.

- d. It showed the devastating effects a moderate earthquake could have on a metropolitan area.
5. Which factor contributed to the passage of the Earthquake Hazards Reduction Act?
 - a. New research indicating all 50 States have some potential for seismic activity.
 - b. The occurrence of devastating earthquakes in 1971, 1975, and 1976.
 - c. Strong legislative leaders and a receptive administration.
 - d. All of the above.
 6. Reduction of risk to life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake reduction program was the:
 - a. purpose of the Earthquake Hazards Reduction Act.
 - b. reason earthquakes were monitored before the 1960s.
 - c. the reason President Johnson asked the National Academy of Sciences to perform a comprehensive study.
 - d. reason postearthquake studies are done.
 7. The Earthquake Hazards Reduction Act created:
 - a. NEHRP.
 - b. the NEHRP *Provisions*.
 - c. FEMA.
 - d. ICSSC.
 8. Which of the following is *not* one of NEHRP's objectives?
 - a. Developing model building codes
 - b. Developing seismically safe building designs and construction methods
 - c. Preventing possible earthquakes
 - d. Increasing the use of existing scientific and engineering knowledge to mitigate earthquake hazards
 9. Seismic safety provisions for existing buildings and lifelines were removed from the original draft of Executive Order 12699 because:
 - a. legislators decided they were not necessary.
 - b. State and local governments automatically take care of these issues.
 - c. solid financial estimates of the cost to meet the seismic provisions could not be prepared.
 - d. it was shown that these provisions would add only a 1-to-2-percent increase in cost to meet the seismic provisions.

10. Executive Order 12699 covers new construction in federally:
 - a. owned, leased (15 percent or more), assisted, and regulated buildings.
 - b. owned, leased (15 percent or more), and assisted buildings.
 - c. owned, leased (80 percent or more), and regulated buildings.
 - d. owned, leased (100 percent or more), assisted, and regulated buildings.

11. The purpose of Executive Order 12699 is to:
 - a. make a building completely seismically safe.
 - b. reduce the risk to the lives of occupants and prevent any damage to a building.
 - c. evacuate buildings before they collapse.
 - d. reduce the risk to the lives of occupants and prevent building collapse.

12. The Robert T. Stafford Disaster Relief and Emergency Assistance Act is mentioned in Executive Order 12699 as an additional requirement. What does it say?
 - a. Temporary emergency paid for with Federal funds need not adhere to the Executive Order's requirements.
 - b. Any rebuilding done after a disaster must meet the Executive Order's requirements.
 - c. Any additions constructed for existing buildings after a disaster must meet the Executive Order's requirements.
 - d. All of the above.

13. Executive Order 12699 states that:
 - a. local building codes will be used by Federal agencies unless they are determined to be insufficient.
 - b. local building codes may not be used by Federal agencies.
 - c. Federal agencies must develop their own standards.
 - d. Federal agencies can use only national standards.

14. Individuals who are not part of the Federal community are:
 - a. not affected by Executive Order 12699.
 - b. affected only if they are *directly involved* in building new construction.
 - c. affected by the Executive Order in many different ways.
 - d. affected only if they lease 50 percent or more of a building to a Federal tenant.

15. As a building code official, I would be responsible for confirming that a building was constructed according to my local building code only. True or false?
 - a. This would always be true.
 - b. False. I may need to confirm that a building code specified by a Federal agency was satisfied.

16. It is not necessary for the decisionmakers and investors to be aware of Executive Order 12699's requirements because the architects will include all necessary seismic provisions in designs for new buildings. True or false?
 - a. True
 - b. False

17. A lender must be concerned only with the Executive Order's requirements if he or she is lending money for new construction of a federally owned building. True or false?
 - a. True
 - b. False

18. A building constructed according to the NEHRP *Provisions* will not be damaged by an earthquake to the point that it has to be demolished. True or false?
 - a. True
 - b. False

19. Some Federal agencies may choose to adopt seismic requirements that are more stringent than those in the NEHRP *Provisions*. True or false?
 - a. True
 - b. False

20. For purposes of complying with the Executive Order, it is in a community's best interest to make sure its local building codes are substantially equivalent to the NEHRP *Provisions*. True or false?
 - a. True
 - b. False

Unit 2

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Unit Review - Answer Guide

1. Which earthquake has been called one of the most violent earthquakes of all time and became one of the best-documented earthquakes in the United States?
 - c. 1964 Alaska
Reference: p. 2-1
2. What agency contributed to the increase in the number of earth scientists and earthquake engineers available in the 1960s?
 - a. Nuclear Regulatory Commission
Reference: p. 2-2
3. Scientists no longer consider earthquake prediction a worthwhile line of research. True or false?
 - b. False
Reference: p. 2-2
4. Why did a moderate earthquake like the 1971 San Fernando earthquake have such a big effect on the U.S. Congress?
 - d. It showed the devastating effects a moderate earthquake could have on a metropolitan area.
Reference: p. 2-2
5. Which factor contributed to the passage of the Earthquake Hazards Reduction Act?
 - d. All of the above.
Reference: p. 2-2

6. Reduction of risk to life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake reduction program was the:
 - a. purpose of the Earthquake Hazards Reduction Act.
Reference: p. 2-3
7. The Earthquake Hazards Reduction Act created:
 - a. NEHRP.
Reference: p. 2-3
8. Which of the following is not one of NEHRP's objectives?
 - c. Preventing possible earthquakes
Reference: p. 2-3
9. Seismic safety provisions for existing buildings and lifelines were removed from the original draft of Executive Order 12699 because:
 - c. solid financial estimates of the cost to meet the seismic provisions could not be prepared.
Reference: p. 2-4
10. Executive Order 12699 covers new construction in federally:
 - a. owned, leased (15 percent or more), assisted, and regulated buildings.
Reference: pp. 2-5 and 2-7
11. The purpose of Executive Order 12699 is to:
 - d. reduce the risk to the lives of occupants and prevent building collapse.
Reference: p. 2-5
12. The Robert T. Stafford Disaster Relief and Emergency Assistance Act is mentioned in Executive Order 12699 as an additional requirement. What does it say?
 - d. All of the above.
Reference: pp. 2-7 and 2-8

13. Executive Order 12699 states that:
- a. local building codes will be used by Federal agencies unless they are determined to be insufficient.
Reference: p. 2-9
14. Individuals who are not part of the Federal community are:
- c. affected by the Executive Order in many different ways.
Reference: pp. 2-10 to 2-14
15. As a building code official, I would be responsible for confirming that a building was constructed according to my local building code only. True or false?
- b. False. I may need to confirm that a building code specified by a Federal agency was satisfied.
Reference: p. 2-12
16. It is not necessary for the decisionmakers and investors to be aware of Executive Order 12699's requirements because the architects will include all necessary seismic provisions in design for new buildings. True or false?
- b. False
Reference: p. 2-12
17. A lender must be concerned only with the Executive Order's requirements if he or she is lending money for new construction of a federally owned building. True or false?
- b. False
Reference: p. 2-12
18. A building constructed according to the NEHRP *Provisions* will not be damaged by an earthquake to the point that it has to be demolished. True or false?
- b. False
Reference: p. 2-8
19. Some Federal agencies may choose to adopt seismic provisions that are more stringent than those in the NEHRP *Provisions*. True or false?
- a. True
Reference: p. 2-9

20. For purposes of complying with the Executive Order, it is in a community's best interest to make sure its local building codes are substantially equivalent to the NEHRP

Provisions. True or false?

a. True

Reference: pp. 2-10 to 2-12