

# **P**ublic **A**ssistance

## **EXPERT PANEL ON COST ESTIMATING**

**Recommendation  
Report of  
Federal Advisory  
Committee 10733**

**October 2002**



**Federal Emergency Management Agency  
Washington, D.C.**



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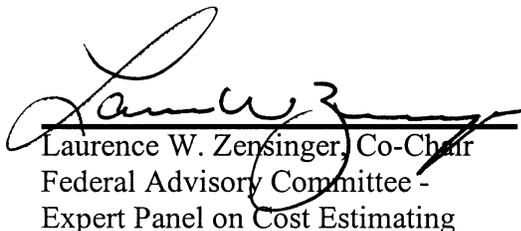


## Foreword

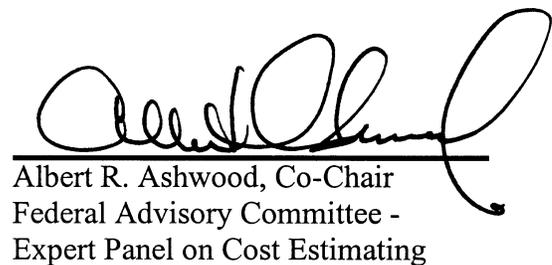
The Expert Panel on Cost Estimating (Panel) for the Public Assistance (PA) Program concludes the evaluation phase of its charter with this Recommendation Report to the Honorable Joe M. Allbaugh, Director of the Federal Emergency Management Agency (FEMA). Congress directed FEMA to establish the Panel in the Disaster Mitigation Act of 2000, Public Law 106-390. The Panel's charter includes evaluating the PA program's methodology for estimating the cost of repairing or replacing a public or private nonprofit facility, recommending procedures for estimating the cost of repairing or replacing a facility consistent with industry practices, and setting reasonable floor and ceiling percentages related to the estimated cost in support of the PA Program.

The Panel endorses the Cost Estimating Format (CEF) for Large Projects and recommends its use to estimate large project costs for all types of infrastructure damage resulting from all disaster types.

The Panel acknowledges the excellent work that FEMA has accomplished in improving its cost estimates to repair or replace publicly owned facilities. The recommendations included in this report will improve upon the efforts that have already been initiated under the CEF. It must be remembered, however, that the recommendations are merely a beginning. To improve the likelihood of developing reliable cost estimates within the floor and ceiling thresholds requires good-faith collaboration among Federal, State and local partners when identifying and documenting the eligible scope of work to repair or replace a damaged facility. With this in mind, the Panel's recommendations should improve the quality of estimating large project costs and budgeting for Federal disasters, and decrease the need for supplemental obligations, in turn lowering administrative costs and freeing disaster personnel for deployment to other disasters.



Laurence W. Zensinger, Co-Chair  
Federal Advisory Committee -  
Expert Panel on Cost Estimating



Albert R. Ashwood, Co-Chair  
Federal Advisory Committee -  
Expert Panel on Cost Estimating





### 1.0 Executive Summary

Federal Advisory Committee 10733 (the Expert Panel on Cost Estimating for the Public Assistance Program) is required by Congress to provide the Director of the Federal Emergency Management Agency (FEMA) with its recommended cost estimating procedures. If approved by the Director, FEMA will promulgate regulations taking into account the recommendations of the Panel.

Also, it is the intent of Congress that the Panel shall function on a continuing basis in accordance with the authorizing statute unless terminated by appropriate legislative authority. Therefore, the Panel will meet not later than one year after the date of promulgation of regulations by FEMA, three years after that date and at the end of each two-year period thereafter. The purpose of the meetings is to examine the appropriateness of the selected cost estimating procedures adopted by FEMA and to periodically submit a report to Congress on the Panel's findings.

The Panel met the complex objectives posed by its Charter. We evaluated the Public Assistance (PA) Program's methodology for estimating the cost of repairing, restoring, reconstructing, or replacing a public facility or private non-profit facility and thoroughly reviewed the Cost Estimating Format (CEF) for Large Project – Instructional Guide, Version 2 (November 1998) and CEF-related training materials. We analyzed, discussed, and selected procedures for estimating the cost of repairing, restoring, reconstructing, or replacing a facility consistent with industry practices, and we established reasonable floor and ceiling percentages related to the estimated cost. The Panel also determined the level of technical expertise required to uniformly apply the selected cost estimating methodology and estimating instrument to maximize accuracy and national applicability.

The Panel has determined that the CEF is appropriate for the PA Program and recognizes that the CEF conforms to accepted estimating practices. It is the consensus of the Panel that FEMA is utilizing a peer-reviewed system for estimating construction costs, which will produce good cost estimates for the large project grants that it manages.

## 1.0 Executive Summary

To foster additional development of the selected cost estimating procedure, the Expert Panel on Cost Estimating presents the following recommendations for implementation:

1. **Employ the cost estimating methodology and worksheet contained in the Cost Estimating Format (CEF) for Large Projects-Instructional Guide, Version 2 (November 1998) to estimate large project costs associated with permanent work under the Public Assistance Program. The recommended cost-estimating procedures are summarized at Section 5.6 (Appendices) of this report.**
2. **Establish reasonable floor and ceiling thresholds for project cost estimates at plus or minus 10%.**
3. **Make use of the greatest degree of design and/or construction documentation detail for developing large project cost estimates when using the CEF.**
4. **Emphasize the following process steps to the large project formulation team, before using the CEF:**
  - Early identification of personnel with discipline-specific, technical expertise is required to more accurately develop a complete scope of work before CEF estimates are generated and should include experienced Cost Estimators.
  - The individual assigned to develop the estimate is a component part of the discipline-specific, technical expertise comprising the Federal, State and local team assigned to the formulation of the large project.
  - To improve the likelihood of realizing reliable cost estimates within the floor and ceiling thresholds requires good-faith collaboration among Federal, State and local partners when identifying and documenting the eligible scope of work to repair or replace a damaged facility.
  - It is best to take a little more time preparing a CEF estimate at the outset. This improves the chances that it will not have to be revisited in the future.
  - Excepting for hidden damages and differing site conditions, working with the applicant early on in the disaster response and recovery process is essential to discussion and agreement on the scope of eligible damages and could be quite helpful in reducing the need for change orders.
  - Whenever possible, base costs captured in Part A of the CEF are to be derived from local cost estimating resources and cost data.

## 1.0 Executive Summary

- Work activities not itemized in the CEF estimate shall be eliminated from the Project Worksheet (such as the deduction for insurance recovery), before the CEF estimated cost and the eligible cost of the actual work are compared. Only when like items of work exist, is the plus or minus 10% threshold between the CEF estimated cost and the eligible cost of the actual work calculated.
5. **Set up resident CEF training at the Emergency Management Institute of FEMA's National Emergency Training Center.**
  6. **Revise the lower-bound percentile for Factor C.1 (Preliminary Engineering Analysis Stage) to 7% within the CEF worksheet and the CEF Instructional Guide to more accurately reflect the risk in bidding simple projects.**
  7. **Obtain cost data for each large project estimated by means of the CEF and analyze the floor and ceiling threshold result.**
  8. **Adjust Engineering and Design Services Curves (A and B) as soon as updated data is received from the American Society of Civil Engineers Committee on Professional Practice.**
  9. **Make periodic revisions and incorporate lessons-learned from previous disasters into the CEF Instructional Guide and/or worksheet, to better ensure that user guidance remains current.**

It is the sense of the Panel at the conclusion of this phase of the Federal Advisory Committee process that a better balance between estimated and actual costs among the engineering, cost-estimating and construction disciplines could be attained through the use of the CEF.

The Panel also acknowledges and expresses its recognition to the people involved in the development of the CEF. They did an exemplary job.

Finally, the Panel wishes to underscore its conviction that the recommendations and the selected cost estimating procedure discussed in the pages that follow can and should be implemented in a way that is wholly consistent with FEMA's commitment to support State and local governments and their citizens when disasters overwhelm them.



**2**

**2.0 Introduction**

**2.1 Expert Panel on Cost Estimating Creation and Composition**

The Expert Panel on Cost Estimating (the Panel) was created by Congress with the Disaster Mitigation Act of 2000. Section 205(e) of this Act mandated that the Panel include representatives from the construction industry and State and local government. In fulfilling the technical and representation requirements of the Act, the Federal Emergency Management Agency invited professional organizations to nominate candidates for membership on the Panel. Panel members were required to have expertise in design, construction and cost estimating of roads, water control facilities, buildings, utility systems, and recreational facilities, and represent various geographical regions of the country. The Federal Emergency Management Agency (also the Designated Federal Official) and the National Emergency Management Association co-chair the Panel. Panel members (see Section 5.7 - Panel Members’ Biographies) and the professional organizations they represent are:

- Albert R. Ashwood** (National Emergency Management Association)
- Robert L. Edelblut, Sr.** (National Society of Professional Engineers)
- Claudette R. Ford** (American Public Works Association)
- R.A. Kai ‘opua Fyfe** (American Society of Professional Estimators)
- Charles F. Harper** (American Institute of Architects)
- G. Michael Hoover** (American General Contractors of America)
- Jon A. Oshel** (National Association of County Engineers)
- Norman H. Roush** (American Association of State and Highway Transportation Officials)
- Laurence W. Zensinger** (Federal Emergency Management Agency)

## 2.0 Introduction

### 2.2 Charter and Duties

#### **The Expert Panel On Cost Estimating for the Public Assistance (PA) Program (the "Panel") - a Federal Advisory Committee**

The Disaster Mitigation Act of 2000, Public Law 106-390 [Section 205(e)(3)] directs the President, acting through the Director of the Federal Emergency Management Agency (FEMA), to establish a methodology, consistent with industry practices, for estimating the cost to repair or replace large projects, to include the establishment of reasonable floor and ceiling thresholds expressed as a percentage of the total eligible project cost. FEMA will base the methodology on recommendations made by a panel of technical experts representing the construction industry and state and local governments. Director Joe M. Allbaugh established the Panel as an Advisory Committee on April 1, 2001, pursuant to the Federal Advisory Committee Act (FACA). As required by FACA regulations, the Panel's charter was filed with House and Senate oversight committees, the General Services Administration, and the Library of Congress; and was formally reviewed and adopted by the Panel on June 26, 2001. See Appendix 5.1 for the Charter of the Expert Panel on Cost Estimating for the Public Assistance Program.

The Federal Advisory Committee charter for the Panel includes the following objectives, responsibilities, and scope of duties:

- Evaluate the Public Assistance (PA) Program methodology for estimating the cost of repairing, restoring, reconstructing, or replacing a public facility or private non-profit facility on the basis of the design of the facility as the facility existed immediately before the disaster, and in conformity with codes, specifications, and standards (including floodplain management and hazard mitigation criteria required by the President or under the Coastal Barrier Resources Act [16 U.S.C. 3501 et. seq.]) applicable at the time the disaster occurred.
- Review the Cost Estimating Format (CEF) for Large Project, Version 2 (November 1998) materials and determine if the CEF is appropriate for the PA Program.
- Determine the level of technical expertise required to uniformly apply the recommended cost estimating methodology and instrument to maximize accuracy and national applicability.
- Submit a Recommendation Report to the Director of FEMA containing a description of the Panel's activities; an evaluation of FEMA's cost estimating procedures and any activities to revise and update these products; and the Panel's recommendations, consisting of:

## 2.0 Introduction

1. procedures for estimating the cost of repairing, restoring, reconstructing, or replacing a facility consistent with industry practices, and
2. establishing reasonable floor and ceiling percentages related to the estimated cost.

## 2.3 Acknowledgments

In its work over the past year, the Panel has been privileged to have the professional advice and counsel of James D. Duffer, Civil Engineer and Executive Officer of the Expert Panel on Cost Estimating for the Public Assistance Program, FEMA, and James A. Walke, Chief of the Public Assistance Branch, FEMA. The Panel also acknowledges the assistance it has received from FEMA's Technical Assistance Contractors: Nationwide Infrastructure Support Technical Assistance Contractors, Fluor Federal Services, and Emergency Response Program Management Consultants.



# 3

## 3.0 Activities and Accomplishments—2001

### 3.1 Meetings

The Panel convened two times during 2001. The meetings were held as follows:

June 26-27, Arlington, VA

September 26, Washington, DC

See appendices 5.2 and 5.4, respectively, for the meeting agendas.

#### 3.1.1 June Meeting—Arlington, Virginia

A notice was published in the Federal Register (Volume 66, Number 102) on Friday, May 25, 2001 announcing the first meeting of the Panel, which was held in Arlington, Virginia on June 26 and 27, 2001 and was open to members of the general public.

The purpose of the meeting was to provide Panel members with: 1.) An overview of the Stafford Act, as amended, 42 U.S.C. §5121 et. seq., Public Law 93-288, and the provision of the Disaster Mitigation Act of 2000, Public Law 106-390, that directs FEMA to establish a methodology, consistent with industry practices, for estimating the cost to repair, restore or replace eligible public facilities that are damaged during a major disaster; 2.) A briefing on the Grant Acceleration Program that FEMA employed during the Northridge Earthquake; and 3.) A briefing on the Cost Estimating Format for Large Projects that FEMA has used since the inception of the redesigned Public Assistance Program. Discussion was also held regarding the Public Assistance Program and cost estimating issues for roads and bridges, water control facilities, buildings, utility systems, and recreational facilities. Finally, the Panel considered current and future requirements for making recommendations on both a cost estimating methodology and reasonable floor and ceiling percentages related to the estimated cost by the first quarter of calendar year 2002.

Specific objectives of the meeting were to:

- Look for better ways to estimate large projects.

### 3.0 Activities and Accomplishments

- Identify reasonable floor and ceiling thresholds that can be achieved using the Panel's selected cost-estimating methodology, which will also provide a level of assurance to Congress that FEMA can prepare reliable estimates. This could be deemed as the level of error in cost estimating that is tolerable.
- Develop a work plan on how the Panel will operate and determine the type of technical assistance that is required to support the Panel.
- In order to attain these goals, FEMA expressed its desire that discussions among Panel members be open, frank and objective. Technical Assistance Contractors (TACS) were available to provide assistance for all Panel meetings.

Regarding the establishment of reasonable floor and ceiling percentages relating to the modification of eligible cost provision of the law, Section 205(e)(2) of the Disaster Mitigation Act of 2000 provides:

#### (A) ACTUAL COST GREATER THAN CEILING PERCENTAGE OF ESTIMATED COST.

In any case in which the actual cost of repairing, restoring, reconstructing, or replacing a facility under this section is greater than the ceiling percentage established under paragraph (3) of the cost estimated under paragraph (1), the President may determine that the eligible cost includes a portion of the actual cost of the repair, restoration, reconstruction, or replacement that exceeds the cost estimated under paragraph (1).

#### (B) ACTUAL COST LESS THAN ESTIMATED COST.

##### (i) GREATER THAN OR EQUAL TO FLOOR PERCENTAGE OF ESTIMATED COST.

In any case in which the actual cost of repairing, restoring, reconstructing, or replacing a facility under this section is less than 100 percent of the cost estimated under paragraph (1), but is greater than or equal to the floor percentage established under paragraph (3) of the cost estimated under paragraph (1), the State or local government or person receiving funds under this section shall use the excess funds to carry out cost-effective activities that reduce the risk of future damage, hardship, or suffering from a major disaster.

##### (ii) LESS THAN FLOOR PERCENTAGE OF ESTIMATED COST.

In any case in which the actual cost of repairing, restoring, reconstructing, or replacing a facility under this section is less than the floor percentage established

## 3.0 Activities and Accomplishments

under paragraph (3) of the cost estimated under paragraph (1), the State or local government or person receiving assistance under this section shall reimburse the President in the amount of the difference.

Therefore, if the actual cost of a project is less than the estimated cost, the applicant may use a portion of the underrun on cost effective mitigation activities. If actual costs are less than the estimated costs by more than a certain percentage, the amount of the underrun that is over the percentage must be reimbursed to FEMA. If actual costs exceed estimated costs and are less than a certain percentage, the applicant absorbs the cost. If actual costs exceed the estimated costs by more than a certain percentage, the amount over the percentage may be eligible, provided the applicant identified additional eligible damage during construction and FEMA approved the revised scope of work.

The Panel chose -10% and +10%, respectively, for the floor and ceiling thresholds. The selected thresholds best represent engineering and construction industry standards for estimating project costs. States will continue to disburse funds to applicants as they complete the work. The law will allow FEMA and the applicants to better estimate the actual cost to repair, or replace damaged facilities and programmatically close applicants and disasters sooner than is the case now.

This provision does not affect Section 422, Simplified procedure, and Section 423, Appeal of assistance decisions, of the Stafford Act.

The Summary Meeting Notes for the first meeting of the Expert Panel on Cost Estimating for the Public Assistance Program are found at Appendix 5.3.

### 3.1.2 September Meeting—Washington, District of Columbia

A notice was published in the Federal Register (Volume 66, Number 167) on Tuesday, August 28, 2001 announcing the second meeting of the Panel, which was held in Washington, District of Columbia on September 26, 2001, and was open to members of the general public.

Specific objectives of the meeting were to:

- Compare and contrast the Cost Estimating Format for Large Projects for the Public Assistance Program with the estimating methods used by the American Society of Professional Estimators (ASPE).
- Discuss and select the procedures for estimating the cost of repairing, restoring, reconstructing, or replacing a facility consistent with industry practices.

### 3.0 Activities and Accomplishments

- Determine the level of technical expertise and training guidance required for uniformly applying the selected cost estimating procedures.
- Discuss the proposal to update Engineering and Design Services Curves (A and B).
- Discuss the format, tone and content of the Panel's Recommendation Report to the Director of the Federal Emergency Management Agency.

The Summary Meeting Notes for the second meeting of the Expert Panel on Cost Estimating for the Public Assistance Program are found at Appendix 5.5.

Additional information about the Expert Panel on Cost Estimating for the Public Assistance Program (Federal Advisory Committee 10733) may be found on FEMA's web pages located at <http://www.fema.gov/rrr/pa/exppanel.shtm>. This site and its Internet links to CEF-related content, include the Panel's Summary Meeting Minutes, presentations made before the Panel by subject matter experts, the Panel's Recommendation Report to Director Joe M. Allbaugh, and the Cost Estimating Format for Large Projects - Instructional Guide, Version 2 (November 1998) and CEF-related training materials.



### 4.0 Recommendations

With unanimous endorsement and support, the Panel respectfully submits the following recommendations:

1. ***The Panel officially endorses the Cost Estimating Format (CEF) for Large Projects-Instructional Guide, Version 2 (November 1998) as the cost estimating methodology and instrument of the Public Assistance Program. The recommended cost-estimating procedures are summarized at Section 5.6 (Appendices) of this report.***

Our endorsement of the CEF is predicated upon the following observations:

- The CEF mandates the use of the Construction Specifications Institute (CSI) Masterformat and estimates are prepared with the CSI number system.
  - The format of the CEF is designed to serve the unique requirements of the PA Program.
  - The organized approach of the CEF promotes consistency in documentation.
  - The CEF has the capability to import and incorporate cost data from other estimating programs.
  - The design of the CEF is flexible and therefore superior to inflexible estimating systems required by some other agencies.
2. ***The Panel recommends plus and minus 10% as the reasonable floor and ceiling thresholds for project cost.***

These thresholds best represent accepted engineering and construction industry standards for estimating project costs. The methods of predicting the final probable cost during project planning are different from methods employed during the final design and construction work stages. Cost estimates formulated during the planning, predesign and early design work stages require careful examination by the cost estimator. Cost estimates formulated during final design work and construction

## 4.0 Recommendations

typically rely on itemizing all the elements of work and applying the respective unit prices. This survey method is more reliable provided the item count and the unit prices are accurate. It is generally accepted that the identification of costs should become more precise as the project moves from planning and predesign (cost planning) into advanced design (cost estimating) stages.

3. ***The Panel recommends that close attention be made to the degree of documentation detail required for developing CEF estimates, as follows:***

- Use the highest level of detail that can be made available from design and/or construction information.
- When available, the use of lump sum competitive bids is discouraged in favor of itemized unit price bids. If used, lump sum bids require 100% full-detailed and complete drawings and the work activities are to be itemized. In either case, estimate accuracy depends upon the completeness of the bid documents.
- The realistic starting point for developing a cost estimate for a disaster-damaged facility is at an American Society of Professional Estimators (ASPE) Level 3. An ASPE Level 3 estimate (or Design Development / Budget Appropriation level) is prepared from not less than 25 percent complete preliminary design drawings and draft specifications. The purpose of this estimate is to establish probable costs within the range of available information.
- In order to attain the plus or minus 10 percent threshold accuracy proposed for a CEF estimate, the Public Assistance process should progress to a level of detail corresponding to an ASPE Level 5. An ASPE Level 5 estimate (or Construction Documents / Contract Drawings / Definitive level) is prepared from not less than 90 percent complete design drawings and specifications. This level shows the probable project cost.

4. ***The Panel reiterates the following points for the purposes of emphasizing their importance to the large project formulation team before using the CEF and underscores that these points either exist and are supported within the CEF for Large Projects - Instructional Guide, Version 2 (November 1998) or the Public Assistance Program's process steps:***

- Early identification of personnel with discipline-specific, technical expertise is required to more accurately develop a complete scope of work before CEF estimates are generated and should include experienced Cost Estimators.

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- The individual assigned to develop the estimate is a component part of the discipline-specific, technical expertise comprising the Federal, State and local team assigned to the formulation of the large project.
  - To improve the likelihood of realizing reliable cost estimates within the floor and ceiling thresholds requires good-faith collaboration among Federal, State and local partners when identifying and documenting the eligible scope of work to repair or replace a damaged facility.
  - It is best to take a little more time preparing a CEF estimate at the outset. This improves the chances that it will not have to be revisited in the future.
  - Excepting for hidden damages and differing site conditions, working with the applicant early on in the disaster response and recovery process is essential to discussion and agreement on the scope of eligible damages and could be quite helpful in reducing the need for change orders.
  - Whenever possible, base costs captured in Part A of the CEF are to be derived from local cost estimating resources and cost data.
  - Work activities not itemized in the CEF estimate shall be eliminated from the Project Worksheet (such as the deduction for insurance recovery) before the CEF estimated cost and the eligible cost of the actual work are compared. Only when like items of work exist is the plus or minus 10% threshold between the CEF estimated cost and the eligible cost of the actual work calculated.
5. ***The Panel recommends that existing CEF training offered at Disaster Field Offices through FEMA's Disaster Field Training Organization (DFTO), be also made a resident course offering of the Emergency Management Institute of FEMA's National Emergency Training Center.***

The target audience for the existing DFTO training includes Project Officers and other Technical Specialists that work with applicants to develop large project cost estimates. The proposed resident offering should also include State personnel with large project cost estimating responsibilities at the DFO. The Panel recognizes that it could take a few years to implement this recommendation and State participation is normally based on the availability of State funds for training purposes. Additionally, CEF training should be offered to FEMA's Public Assistance Coordinators, Public Assistance Officers and management officials responsible for disaster operations, and thus be made aware of the benefits—and limitations—of using the CEF. The Panel's

## 4.0 Recommendations

recommendations, when implemented, will have a major impact on the selection of Project Officers and Technical Specialists in the future.

Additionally, and whenever possible, validate a cost estimator's experience and ability to generate productivity rates (i.e., create estimates on a quantity times material, labor hour and equipment cost format). For example, qualification testing could be accomplished before and after CEF training for this purpose.

6. *The Panel recommends that the lower-bound percentile for Factor C.1 (Preliminary Engineering Analysis Stage) be revised within the CEF worksheet and the CEF Instructional Guide to more accurately reflect the risk in bidding simple projects at this time.*

The preliminary engineering analysis stage is a design-phase scope contingency that allows for the fact that projects often contain more elements when they are fully designed than could have been anticipated earlier in the design process. While the Panel recognizes the importance of characterizing the state of the project design development at the time that the CEF is prepared, it is the sense of the Panel that the lower-bound percentile of 15% (see Appendix 5.5) does not accurately depict the actual risk of bidding a simple project. The lower-bound percentile is more realistically on the order of 7%, at this time.

7. *The Panel recommends that cost data be obtained for use in analyzing results for each large project estimated by means of the CEF.*

The Public Assistance Officer forwards a "CEF-Large Project Report" to FEMA Headquarters that includes estimated and actual post-construction costs among other information elements related to CEF use. To facilitate FEMA's efforts in collecting this information, the Panel encourages FEMA to incorporate CEF data collection efforts into its existing Public Assistance module of the National Emergency Management Information System (NEMIS). This will allow FEMA the ability to standardize information reporting requirements, facilitate project cost-data development, and to electronically access data for analysis. The Panel recognizes that it will take at least a few years to procure sufficient data to determine how well the CEF performs.

The Panel emphasizes that CEF data collection from NEMIS (or another system yet to be defined) be designed for comparison of like work activities between the final CEF estimated costs and the eligible costs of actual work. It is critical that work activities not itemized in the CEF estimate be eliminated from the Project Worksheet (such as the deduction for insurance recovery), before the CEF estimated cost and the eligible cost of the actual work are compared. Only when like items of work exist, is

## 4.0 Recommendations

the plus or minus 10% threshold between the CEF estimated cost and the eligible cost of the actual work calculated.

8. *The Panel recommends that Engineering and Design Services Curves (A and B) be updated as soon as practicable when received from the American Society of Civil Engineers Committee on Professional Practice.*

There was general consensus among the Panelists that the 1975 curves still being used by FEMA are lower than current engineering and construction costs. This was not important before CEF when Architectural and Engineering (A&E) costs were adjusted to reflect actual eligible expenses. However, under CEF, a better estimate of A&E costs is necessary.

9. *Make periodic revisions and incorporate lessons-learned from previous disasters into the CEF Instructional Guide and/or worksheet, to better ensure that user guidance remains current.*



5

## 5.0 Appendices

### 5.1 Charter

FEDERAL EMERGENCY MANAGEMENT AGENCY  
CHARTER OF  
EXPERT PANEL ON COST ESTIMATING  
FOR THE  
PUBLIC ASSISTANCE PROGRAM

ESTABLISHMENT:

The Director of the Federal Emergency Management Agency (FEMA), in accordance with the Disaster Mitigation Act of 2000 (Public Law 106-390, Section 205e(3)), has established the Expert Panel on Cost Estimating for the Public Assistance Program (hereinafter referred to as the Panel). The Panel is established as an Advisory Committee pursuant to the Federal Advisory Committee Act, 5 U.S.C. Appendix I, and the Presidential Reorganization Order Number 3 of 1978.

OBJECTIVES AND SCOPE OF DUTIES:

1. The objective of the Panel is to evaluate the Public Assistance (PA) program's methodology for estimating the cost of repairing, restoring, reconstructing, or replacing a public facility or private nonprofit facility-
  - a. on the basis of the design of the facility as the facility existed immediately before the disaster; and
  - b. in conformity with codes, specifications, and standards (including floodplain management and hazard mitigation criteria required by the President or under the Coastal Barrier Resources Act (16 U.S.C. 3501 et. seq.)) applicable at the time at which the disaster occurred.

## 5.0 Appendices

2. The Panel shall make recommendations to the Director concerning-
  - a. procedures for estimating the cost of repairing, restoring, reconstructing, or replacing a facility consistent with industry practices; and
  - b. reasonable floor and ceiling percentages related to the estimated cost.
3. In carrying out its responsibilities, the Panel shall:
  - a. Review the Cost Estimating Format for Large Projects (CEF) materials and determine if the CEF methodology is appropriate for the PA program.
  - b. Determine what level of technical expertise is required to uniformly apply the recommended estimating methodology and instrument to maximize their accuracy and national applicability.
4. Not later than one year after the date of promulgation of regulations by FEMA (based on item 2 above), three years after that date, and at the end of each two-year period thereafter, the Panel shall submit to Congress a report on the appropriateness of the cost estimating procedures.
5. The Panel may consult Federal, State, or local government agencies or private firms and individuals; and conduct research as necessary to meet its objectives.
6. The Panel may make interim comments and recommendations to the Director whenever there is an indicated urgency to do so in fulfilling its duties.
7. Members will attend Panel meetings and review and approve meeting minutes.
8. The Panel functions solely as an advisory body and will comply fully with the provisions of the Federal Advisory Committee Act.
9. FEMA will provide technical support, including research, to the panel.

### MEMBERS OF THE PANEL:

The Panel shall be comprised of up to ten members. The members of the Panel will include technical experts from the construction industry, State government, local government, and academia, and representatives from the National Emergency Management Association and the Federal Emergency Management Agency.

The Director shall appoint a Chairperson and Vice-Chairperson from the Panel membership.

The FEMA Office of the General Counsel will brief Panel members on Federal ethics rules, employment and financial interests, and criminal conflict of interest statutes.

### MEETINGS:

Depending on funding availability and scheduling considerations, the Panel shall meet up to two times in Federal fiscal year 2001 and one time in Federal fiscal year 2002.

Thereafter, the Panel will meet not later than one year after the date of promulgation of regulations by FEMA, three years after that date and at the end of each two-year period. The purpose of these meetings is to conduct an examination of the appropriateness of the cost estimation procedures developed during the meetings conducted in fiscal years 2001 and 2002, and to prepare and submit a report to Congress on the Panel's findings.

### ADMINISTRATIVE PROVISIONS:

The members of the Panel shall be reimbursed for eligible invitational travel and subsistence expenses incurred in the performance of their duties as members of the Panel.

FEMA's Infrastructure Division, Response and Recovery Directorate will provide administrative support for the Panel.

Panel meeting minutes shall be maintained and shall be subject to the Freedom of Information Act. All records pertaining to the Panel shall be maintained in the office of FEMA's Infrastructure Division, Response and Recovery Directorate.

The annual operating cost associated with supporting the Panel's functions (including all direct and indirect expenses) are estimated to be:

- \$252,000 in contractor support and approximately ½-person year for FY 2001 and
- \$98,000 in contractor support and approximately ¼-person year for FY 2002.

The annual operating cost associated with supporting the Panel's functions thereafter is estimated to be \$25,000 per year.

## 5.0 Appendices

### DURATION:

The Panel shall function on a continuing basis in accordance with the authorizing statute unless terminated by appropriate legislative authority. In compliance with Section 14(b)(2) of the Federal Advisory Committee Act, a Charter shall be filed upon the expiration of each successive two-year period following the date of the enactment of the Disaster Mitigation Act of 2000, Public Law 106-390, on October 30, 2000.

\_\_\_\_\_/s/\_\_\_\_\_  
Joe M. Allbaugh  
Director  
Federal Emergency Management Agency

April 1, 2001  
Date

## 5.2 June 26 and 27, 2001 Agenda

### 1<sup>ST</sup> MEETING OF THE EXPERT PANEL ON COST ESTIMATING FOR THE PUBLIC ASSISTANCE PROGRAM

CRYSTAL CITY MARRIOTT  
1999 JEFFERSON DAVIS HIGHWAY  
SALONS B AND C  
ARLINGTON, VA. 22202

#### June 26, 2001 (Tuesday)

9:00 am	Welcome and Introductions	Laurence Zensinger Co-Chair and Designated Federal Official and Albert Ashwood Co-Chair
9:30 am	Administrative and Review Agenda	Laurence Zensinger
9:45 am	Review Charter	Laurence Zensinger Albert Ashwood
10:45 am	Overview of Public Assistance Program and Disaster Mitigation Act of 2000	James Walke
1:00 pm	Grant Acceleration Program (GAP) Presentation	Randolph Langenbach and Theodore Van Kirk
2:30 pm	Break	
3:00 pm	Cost Estimating Format (CEF) for Large Projects Presentation	J. David Duffer and Brian Leap

## 5.0 Appendices

4:30 pm	Questions & Answers, and Comments from Members of the General Public	Expert Panel
5:00 pm	Adjourn	Co-Chairs

### **June 27, 2001 (Wednesday)**

8:00 am	Panel Convenes Objectives:	Co-Chairs J. David Duffer
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1. Further consideration and discussion of GAP and CEF.
2. Discuss current estimating techniques employed in the engineering and construction industry.
3. Develop work plan for how the Panel will operate.
4. Develop the best approach for fulfilling the charter of the Panel.
5. Identify the technical requirements necessary to support the Panel, and make work assignments.
6. Finalize work plan for how the Panel will operate (and make Panel member assignments).
7. Schedule the next Panel meeting.

4:30 pm	Questions & Answers, and Comments from Members of the General Public	Expert Panel
5:00 pm	Adjourn	Co-Chairs

### 5.3 June 26 and 27, 2001 Summary Meeting Notes



## Federal Emergency Management Agency

### Summary Meeting Notes from First Meeting of the Expert Panel on Cost Estimating for the Public Assistance Program

June 26 and 27, 2001

Crystal City Marriott  
Salons B and C  
1999 Jefferson Davis Highway  
Arlington, Virginia

#### ATTENDEES

##### Panel Members

Laurence Zensinger	Panel Co-Chair and Designated Federal Official, Federal Emergency Management Agency (FEMA)
Albert Ashwood	Panel Co-Chair, National Emergency Management Association
Robert L. Edelblut, Sr., PE	National Society of Professional Engineers
Claudette Ford	American Public Works Association
Kai 'opua Fyfe, CPE	American Society of Professional Estimators
G. Michael Hoover	Associated General Contractors of America
Norman H. Roush, PE	American Association of State Highway and Transportation Officials

##### FEMA Presenters and Technical Support

David Duffer	FEMA
Randolph Langenbach	FEMA
Brian Leap	Fluor Federal Services
Jenny Novillo	DMJM
Ken Rock	Earth Tech
Ted Van Kirk	Nationwide Infrastructure Support Technical Assistance Contractors
James Walke	FEMA

## 5.0 Appendices

### Members of the General Public Attending

Miguel Becerril	Puerto Rico Federal Affairs Administration
Martha Braddock	(no affiliation provided)
Roni Brohammer	American Public Works Association
Graeme R. Cox, PE	California Governor's Office of Emergency Services
Jonathan Glazier	National Rural Electric Cooperative Association
Susan Healey	FEMA
Mike Hirsch	FEMA
Bob Hobart	Fluor Federal Services
Melissa Howard	FEMA
Jonathan Hoyes	Nationwide Infrastructure Support Technical Assistance Contractors
MK McDonough	FEMA
Donald Pilon	International Association of Emergency Managers
William Quade	DMJM
Kristin C. Robinson	National Emergency Management Association
James Strange	American Public Power Association
Howard Stronach	FEMA
James Wayne	FEMA
Amy Weinhouse	FEMA

### Day #1 (Tuesday, June 26, 2001)

#### Background

Section 205e(3) of the Disaster Mitigation Act of 2000 (Public Law 106-390), directs the Federal Emergency Management Agency (FEMA) to establish a methodology, consistent with industry practices, for estimating the cost to repair, restore, or replace eligible public facilities that are damaged during a major disaster. To accomplish this objective, FEMA is directed to establish an expert panel (Panel) consisting of industry, State, and local representatives to develop cost estimating procedures. The Panel is subject to the requirements of the Federal Advisory Committee Act (FACA). Accordingly, the Director of FEMA signed the Panel's charter on April 2, 2001. The charter was filed with the General Services Administration's Office of the Committee Management Secretariat pursuant to FACA regulations. A notice was subsequently published in the Federal Register (Volume 66, Number 102) on Friday, May 25, 2001 announcing the first meeting of the Panel, which was held in Arlington, Virginia on June 26 and 27, 2001 and was open to members of the general public.

The purpose of the meeting was to provide Panel members with an overview of the Public Assistance Program and FEMA's efforts to better estimate the cost to repair large projects. See Appendix A for the agenda. These efforts include the development of the Cost Estimating Format for Large Projects (CEF) and the pilot testing of the Grant Acceleration Program. FEMA believes the CEF is a reliable cost estimating tool, which was independently peer-reviewed by the American Society of Civil Engineers. The Panel should consider the merits of the CEF.

### Introductory Remarks

- Mr. Zensinger opened the meeting at 9:00 AM, by welcoming participants and inviting everyone to introduce themselves to the group. He stated that the Panel would meet again in September 2001, and if needed, a third meeting would be scheduled for October 2001. A Panel Recommendation Report is due by January 2002. The report will be used to publish a final rule regarding the selected cost estimating methodology and floor and ceiling thresholds, in the Federal Register by November 2002. He stated that members of the general public may speak at the advisory committee meeting when the floor is open for this purpose from 4:30 PM until the meeting is adjourned, each day the Panel convenes.
- Mr. Zensinger noted that FEMA does not have lots of "psychological lead time" to plan for projects after a disaster. FEMA's goal is to fund projects quickly and accurately and closeout projects as soon as possible.
- The Disaster Mitigation Act of 2000 will make it possible for FEMA to get money to applicants faster.
- Grants to applicants for the repair to pre-disaster condition of facilities damaged by a disaster are authorized under the Stafford Act. This Act also defines a threshold, adjusted annually for inflation (\$50,600 for FY01), which in turn, defines a large project.

### Objectives

Specific objectives of the meeting were to:

- Look for better ways to estimate large projects.
- Identify reasonable floor and ceiling thresholds that can be achieved using the Panel's selected cost-estimating methodology, which will also provide a level of assurance to Congress that FEMA can prepare reliable estimates. This could be deemed as the level of error in cost estimating that is tolerable.

## 5.0 Appendices

- Develop a work plan on how the Panel will operate and determine the type of technical assistance that is required to support the Panel.
- In order to attain these goals, FEMA desires that discussions among Panel members are open, frank and objective. Technical Assistance Contractors (TACS) will be available to provide assistance for all three meetings of the Panel.

### **The Public Assistance Program**

James Walke gave a presentation on FEMA's Public Assistance (PA) Program and the impacts of the Disaster Mitigation Act of 2000 on the PA program. See Appendix B for the presentation.

The PA Program provides supplemental Federal disaster grant assistance for the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations. The Federal share of assistance is not less than 75% of the eligible cost for emergency measures and permanent restoration. The State determines how the non-Federal share (up to 25%) is split with the applicants. Presentation topics included the application process, eligible applicants, eligible work, project requirements, types of cost data used by FEMA, average project cost, and average project cost for large projects.

The Disaster Mitigation Act of 2000 (DMA2K) amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act, which authorizes Federal assistance to State and local governments in carrying out their responsibilities to alleviate the suffering and damage, that result from disasters. Presentation topics included DMA2K's immediately effective provisions on the PA Program, consisting of alternate projects, private non-profit organizations, Small Business Administration, definitions, notification to Congress, and public notice. The DMA2K's delayed provisions on the PA Program were also presented and consisted of reduced Federal share for repetitive damages, management costs, and cost estimating procedure.

### **The Grant Acceleration Program (GAP)**

Randolph Langenbach gave an overview on FEMA's GAP. See Appendix C for the presentation.

GAP was initiated following the Northridge Earthquake where large, complex buildings were damaged. Damages were not apparent in many cases during the initial inspection, and there were many cases of serious underlying structural damages that required sophisticated engineering analysis. GAP was established as a voluntary program to allow participants to receive a fair and reasonable fixed budget amount up-front, thereby

accelerating the normal funding procedure for large projects. This reduced FEMA involvement during construction, reduced applicant administrative costs, and allowed FEMA to more quickly settle claims for large, complex building projects. Presentation topics included the purpose of GAP, the prior cost-estimating situation and results, the value of the CEF and GAP process, early CEF development, and the objectives of CEF.

Ted Van Kirk gave an overview on the origins, development and verification of GAP. See Appendix C for the presentation.

Applicants' desire negotiated settlements, as is done in the insurance industry, without having to request supplements for changes in scope or when a need for additional funding is discovered. GAP was set up as a voluntary program that offered incentives to applicants in the use of project savings generated by the program, a known project budget, and less FEMA oversight and involvement in the project. For the Northridge Earthquake, 86 applicants accepted GAP offers. Validation efforts undertaken to date show that GAP is working. Presentation topics included the origins of GAP, how to make GAP work, a comparison of GAP pilot implementation during the Northridge earthquake, the concept and development of GAP, the test case phase and results of GAP, statistics on pilot closeout efforts to date, and GAP challenges.

### **General Discussion**

There was a general discussion among Panel members following the GAP presentation.

Concerns were expressed about the possibility of applicants being under-funded under GAP. In response, a Northridge applicant's management of repairs under normal FEMA procedures and GAP procedures was shared with the Panel. Under normal procedures, there is no incentive to make cost effective decisions; rather there is a tendency to wait for a FEMA supplemental before proceeding with changed conditions. The GAP provided a budget for the repairs that the applicant managed carefully. This resulted in expeditious repairs and quick cost effective decisions when changes were identified. It was reiterated that FEMA has not adopted GAP. It has been used only in a pilot test for the Northridge earthquake. Regardless of the methodology used, FEMA make funds available immediately to begin the recovery process. However, in the case of large complex building projects damaged by an earthquake, the architect/engineering process is complex and lengthy. The process requires much interaction between FEMA, the applicant, and the engineers and designers. It has been FEMA's experience that GAP should provide incentives that reduce administrative costs.

## 5.0 Appendices

### **The Cost Estimating Format for Large Projects (CEF)**

Brian Leap gave an overview relating to the peer review that was conducted on FEMA's CEF. See Appendix D for the presentation.

CEF is a standardized format for estimating the cost of large projects. It was initially developed following the Northridge Earthquake recovery effort and was applied to large, complex building projects only. The revised, version received a peer review by the American Society of Civil Engineers (ASCE) in 1998. The CEF is in the form of a workbook that provides a uniform method for preparing estimates and is explained in much greater detail in the Cost Estimating Format for Large Projects - Instructional Guide (Version 2), November 1998. Presentation topics included the focus of the peer review, the committee, the process, the conclusions and recommendations; the background of the CEF; a description of what CEF is and is not; and the advantages and future goal of CEF.

David Duffer gave a detailed presentation on the CEF. See Appendix D of the presentation.

The revised version of the CEF can be used for all types of infrastructure damage, in all types of disasters. This version has been tested against data from large project closeouts and undergone a peer review by an independent group of industry experts who evaluated the methodology, substantiated component factors, and recommended improvements necessary to apply the CEF nationally.

The CEF provides a worksheet, called Part A, that allows the user to estimate base construction costs. The user then applies a series of factors (Parts B through H) that represent non-construction costs. These expenses can reasonably be expected to occur because they are construction-related costs usually encountered during the course of construction. These factors are applied to the Part A base construction costs to estimate the total cost of completing the project. This "forward-pricing" methodology provides an estimate of the total eligible funding at the beginning of the project. This estimate is used to obligate funds for the project and allows the applicant to more accurately manage the budget with a greater degree of confidence.

Presentation topics included a description of the CEF process and how it fits into the Public Assistance Program, each of the factors that makes up the CEF, how the factors are to be applied to the base construction cost estimate, and how to use the CEF workbook in the estimate calculation. Teams using the CEF will be comprised of professional engineers and cost estimators who have been in responsible charge of important engineering work or have extensive experience in the construction industry.

**General Discussion**

Following the CEF presentation, Panel members expressed their general consensus that the CEF is a sound tool and discussion focused on how to make the CEF better.

The applicant needs to be involved in developing the cost estimate and all parties involved in the project must have a clear understanding of the scope of work, and that scope of work remains consistent throughout the life of the project. Whatever we do and decide on, it has to be simple and transparent. It must be clear to a lot of people who will be involved in the review process. While the Project Officer is responsible for developing the Project Worksheet in a multi-disciplinary environment, Panel members agreed that the lead estimator is responsible for developing the actual construction cost estimate and should participate in the on-site review of the project conducted by the Project Officer. However, cost estimates need to be built to get an end product; there is no simple solution. Cost estimating is a “build as you go” procedure.

Deployment of multidisciplinary teams has helped in the recovery process for the Northridge and Nisqually earthquakes. In general, applicants have been pleased with the quality of estimates. Using an integrated, seamless process where everyone works together as a team has worked well. This can be accomplished by using applicant-provided cost data wherever possible. We are clearly further along in the recovery process now in Nisqually using the CEF, than we would have been without it.

Panel members agreed that the factors used in the CEF are acceptable, and acknowledged that some project savings and overruns will still be realized in the real world as a result of open market conditions.

**Plan for Day #2**

It was agreed on day 2 that the Panel would think about the CEF factors and floor and ceiling thresholds, and what else the Panel needs to accomplish.

The meeting adjourned at 5:00 PM.

**Day #2 (Wednesday, June 27, 2001)**

The meeting commenced at 8:00 AM.

**Recap of Day #1**

The Panel agreed that CEF is a reliable tool and that the GAP was an appropriate program, but we should not focus further on the GAP in our discussions. Relating to the CEF, we need to talk more about factors and what categories the factors are in.

## 5.0 Appendices

### General Discussion

Following the recap, Panel members focused their discussion on the adoption of a cost-estimating methodology that requires expertise:

- A higher level of expertise (multi-disciplinary) is needed at the early stages of developing an estimate. The challenge is to make this process as easy as possible.
- Additional details for the estimate are filled in later using the same format and approach.
- Factors will be valid and applicable if the core estimate is sound.
- Whenever possible, FEMA should use local professionals who are familiar with costs in the area affected by a disaster.
- The CEF format developed by FEMA is reliable. The worksheet prompts people to think about the project and does what you require it to do. The markups seem a bit high, but there is a recognized need for a standard system that must work around the country.
- It's hard to mandate what people should do. We might consider a two-phased approach. It should allow changes later on in the process if complications arise or if new conditions are discovered. Alternatively, FEMA could process two PWs -- one for initial work and architect/engineering services while the complete CEF is being developed.
- Remember that we want to move the entire program in the direction of “improved projects” where we give the applicant money and don't have to track it further. This approach allows applicants to get the money and make decisions.
- The CEF is an appropriate form, but it needs to be used with accuracy in the field. Applicants need it to reserve required matching funds. A reliable estimate is essential.

Panel members then focused their discussion on the CEF, its component factors, consideration for equipment and contents, and reasonable floor and ceiling thresholds, in order to fulfill the requirements of the charter:

#### CEF

- CEF should mirror, as closely as possible, standard industry methods, such as those used by the American Society of Professional Estimators (ASPE). ASPE

Committee members will be asked to help with this effort. If we remove the disaster factor, we can view the effort as simply giving a developer an estimate for a job. The estimate should be complete, but not all the details need to be known.

- CEF is an incremental-complexity instrument. There is less-risk as more information becomes known and as the process moves forward. CEF provides a template only; not all parts of the worksheet need to be filled in.
- It will prove difficult to find people that meet FEMA's criteria for estimators. FEMA must provide appropriate in-house training for estimators so people can be pre-qualified with the right type and level of expertise to work on a disaster. The GS-11 level currently specified is too low. An alternative could be implementation of the estimating contractor approach, where a lead estimator would be required to possess the necessary Public Assistance Program expertise. This person could provide program guidance to other estimators less skilled in the provisions of the PA Program, while the cost-estimating cadre is being developed.
- It is important to get decision making down to the local level. FEMA and States do not build buildings – we write checks. The locals do all the work. Our job should be to get the money to them as soon as possible. The CEF is a sound reference document to make sure that the right items are included in the cost estimate.
- FEMA needs to do a better job educating applicants. We need to have open discussions about the scope of work. Applicants are not overly concerned about the role of the State in FEMA's program.
- What we're really talking about is pre-qualification of estimators. Certified Professional Estimator is a recognized qualification in the industry. In response, the Panel agreed that qualified estimators are needed, but noted that becoming a certified estimator should not be a requirement of the job.
- Panel members agreed that:
  - ✓ Some pre-qualification or certification is required and that a Professional Engineer (PE) license or Professional Estimator Certification is desired.
  - ✓ Additionally, disciplinary expertise is needed that focuses on the specific type of facility being estimated (e.g., bridges, buildings, etc.).

## 5.0 Appendices

- ✓ More expertise in the field from FEMA contract staff, as well as with full-time FEMA staff will be required.

### CEF Factors

- Factors may be adjusted in the field to reflect local conditions. Factor adjustment is covered on pages 10 and 11 of the CEF Instructional Guide. It is important to remember that:
  - ✓ The factors in the back of the Guide are from RS Means and should be used only as a second or third cost data choice, only when local cost information is not available from the applicant.
  - ✓ We want to include as many line items in Part A as possible. The best option is to get specific cost data for Parts B through H, directly from the applicant, only for those cases in which you are unable to otherwise line item your work activities in Part A, thereby eliminating consideration for most of the other factors (i.e., Parts B-H). Regardless, the Public Assistance Officer (PAO) on each disaster is responsible for obtaining and developing this data, consistent with the established procedure for estimating large projects.
  - ✓ CEF is not a one-size-fits-all methodology. It has been specifically designed to customize a cost estimate for each project. Additionally a team approach or partnership is absolutely needed, with specialized technical expertise available from any member of the partnership, as required for prudent consideration for the facility being estimated.

### Equipment and Contents

- For equipment and contents, we will require similar expertise as discussed above, but in the areas of equipment and contents (i.e., furnishings, computers, etc.). Contents are generally amenable to the factor approach and could be developed, however, unless specialized equipment is involved, such as a Magnetic Resonance Imaging machine at a hospital, an inventory list depicting the actual purchase price and the date of purchase is still preferred. This is why FEMA's CEF was developed to estimate construction costs (permanent and non-permanent work) only.

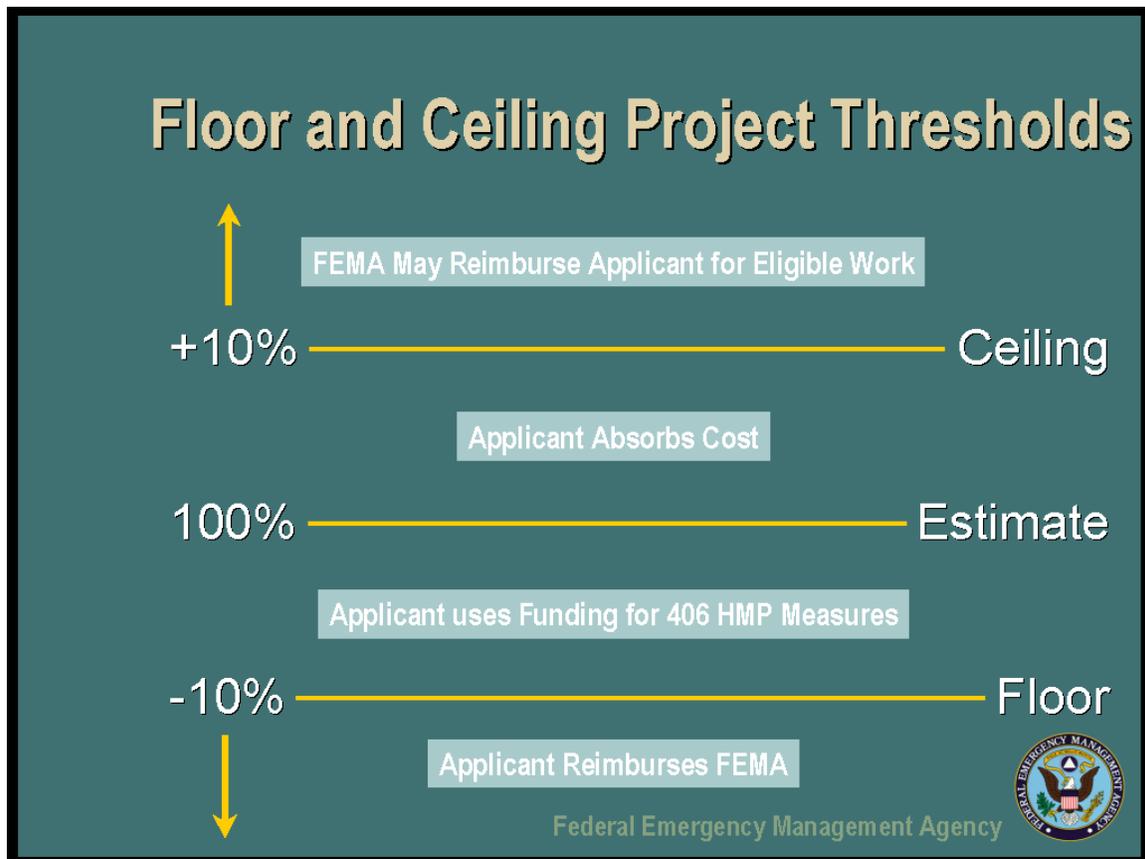
### Proposed Floor and Ceiling Threshold for Cost Estimates

- FEMA's general experience with CEF to date shows that:
  - ✓ For project costs of \$2 to \$4 million, the project range is (plus or minus) 10%.

- ✓ For project costs less than \$2 million, we've experienced cost overruns of more than 20%.
- ✓ For project costs greater than \$4 million, we've experienced cost underruns of more than 20%.
- Our mission is to report to Congress on how we're doing. We have two years to test and refine our new system. Our goal is not to convince Congress of anything. The ceiling and floor thresholds will apply to large projects only at this time.
- Applicants need to be part of the process from the outset and FEMA needs to be clear on the methodology.
- We need to be explicit regarding two issues, eligibility and cost estimating. Eligibility is totally separate from the cost estimating process. Applicant expectations may not always be realistic in the areas of eligible scope of work and eligible project cost.
- Developing costs is a cooperative process. Once everyone agrees on costs, we need to be able to determine the right amount and then walk away. We also need to establish a cutoff date for making changes to a project.
- We need to be careful with this. If there is a bid of \$7 million on a project that was estimated at \$10 million, then is the underrun returned to FEMA?
- In explanation, FEMA asked Panel members to consider two project scenarios:
  1. if a bid is \$13 million, for a job estimated at \$10 million
  2. if a bid is \$10 million, for a job estimated at \$13 million
- After some discussion of estimates and contractor bids based on the two above scenarios, it was apparent that not all agreed on the correct interpretation of the Disaster Mitigation Act of 2000 relating to the establishment of ceiling and floor estimates. To assist further, FEMA sketched the following illustration (that was subsequently generated and depicted electronically – see next page) on an easel pad for the consideration of Panel members. Panel members agreed with the illustration and better understood the legislation.

## 5.0 Appendices

- Need to remember that in a disaster situation, contractors will be overworked and are likely to be charging higher rates for their services as a result of greater project demand. This may be true even if it's six months after the disaster, or depending on the magnitude of the disaster, the duration could be even longer.



- Panel members reached consensus and recognized that plus and minus 10% are reasonable floor and ceiling thresholds for project cost, as derived from construction industry standards.

It was understood that some projects in the \$50 to \$100K range could fall outside the threshold, but there was general agreement that the 10% number is appropriate and that using the same number across the board would make the program easier to administer.

Should certain projects be exempted on a case-by-case basis, but not as a general rule? Or should the contractor be part of the partnership and be aware of FEMA's cost estimate? All agreed that history shows that contractors tend to bid at or above the estimate amount and therefore, providing cost estimates to contractors would provide no immediate benefit. Panel members agreed that the selected cost estimating process must allow an opportunity for project settlement right at the start and the establishment of a project completion date. This last incentive helps an applicant to actually complete eligible project work and restore services of a governmental nature to the community.

### **Review of How the Panel will Operate**

- 1) Develop a work plan.
- 2) Fulfill the requirements of the charter.
- 3) Determine if CEF is appropriate. Remember that Congress wants a methodology that we can share with applicants to make sure they get all the money they're entitled to. We don't need to "sell" the plan to Congress, per se.
- 4) Identify any technical assistance that may be needed.

### **Structure of Panel Recommendations Report to the Director**

The Panel agreed that:

- 1) The report will acknowledge the fine work done on the CEF.
- 2) Include information on the GAP and other relevant information from the Northridge Earthquake.
- 3) Discuss the plus and minus 10% range that has been chosen for the floor and ceiling thresholds.
- 4) The Panel will submit a draft of the report to Laurence W. Zensinger, Panel Co-Chair and Designated Federal Official and Albert R. Ashwood, Panel Co-Chair for their review and approval. It will then go to the Assistant Director (or his authorized designee) of FEMA's Response and Recovery Directorate, prior to proceeding to Joe M. Allbaugh the Director of FEMA. If the Director agrees with the recommendations, the report will be used to publish interim and final rules in the Federal Register for public review and comment.

## 5.0 Appendices

### General Discussion

- Notes taken from this meeting will be distributed to Panel members. We can then use those notes as a basis for making recommendations that can also be included in the report.
- The Panel discussed curves A and B (used for determining the percentage of Engineering and Design Services for a large project) as contained within Part H of the CEF Instructional Guide. The Panel reached general consensus that the curves are indeed outdated, and that technical support should be used to collect updated information needed for an update. This information should be made available for the next meeting of the Panel.

### Recap of Technical Requirements

- 1) In order for Panel members to officially endorse FEMA's CEF on behalf of their respective professional organizations, the Panel directed that two comparative analyses be performed between FEMA's Cost Estimating Format for Large Projects - Instructional Guide, Version 2 (November 1998) and ASPE's Standard Estimating Practice, Fifth Edition (October 1998). The first comparative analysis will be performed by each of FEMA's Technical Assistance Contractors (TACs) and the second comparative analysis by ASPE's Standards, Certification and Education Boards. The results of the comparative analyses will be made available for Panel deliberations during their second meeting and could be used by the Panel to augment and/or revise FEMA's Cost Estimating Format for Large Projects - Instructional Guide, Version 2 (November 1998).

The independent comparative analysis will consist of:

- a. validating whether or not the CEF is parallel to ASPE's level 3 (design, development/budget appropriation) estimating approach. If the CEF is not parallel to an ASPE level 3 estimate, say so and identify the ASPE level that the CEF is parallel to, and
  - b. validating whether or not a CEF estimate (at an ASPE level 3) would provide a level of confidence commensurate with an ASPE level 5 (construction documents/contract drawings/definitive) estimate, such that the CEF estimate (at an ASPE level 3) would be within the  $\pm 10\%$  floor and ceiling thresholds selected by the Panel.
- 2) The Panel requested FEMA to contact and obtain current data from the National Society of Professional Engineers (NSPE), the American Institute of Architects

(AIA), and the American Consulting Engineers Counsel (ACEC) on a proposed update to curves A and B (used for determining the percentage of Engineering and Design Services for a large project) as contained within Part H of the CEF Instructional Guide. This information should be made available for the next meeting of the Panel.

### General Public Comments

- Graeme Cox: It is important to remember that State personnel need training too. It is not clear if additional guidance is forthcoming on how and when CEF should be used. For example, do applicants have a choice of whether they want to use it or not? In other words, if CEF is required, can applicants opt out? Thinks it would be appropriate to begin a new process at the start of a disaster, rather than transition half way through a disaster. (Response from FEMA: Before CEF is officially adopted, regulations will be issued for public comment. Comments will be responded to and, if the regulations are adopted, they will be required for everyone. CEF is an estimating methodology and not a substitute for the Grant Acceleration Program.)
- Randolph Langenbach: Want to point out that a substantial change in the scope of work required (e.g., based on new information discovered during the recovery process) would drive a reevaluation of funding for the project.
- Bob Hobart: Training is essential. It is done weekly at Nisqually.
- Jonathan Hoyes: Agree that we need to take another look at the cost curves.
- Claudette Ford: The report should provide a clear explanation about the benefits of CEF to municipalities and others.
- Kai 'opua Fyfe: I think we've had some appropriate discussions and interaction. The report should include background information in an executive summary. It would make the benefits to the applicant clearer and make the whole report seem smoother and more holistic. Additionally FEMA needs to develop a database of historical disaster related construction costs for large projects that use the recommended cost estimating procedure.

### Closing Administrative Comments

- After Panel discussions, it was agreed that the next meeting will be on September 26 and 27, 2001 (Wednesday and Thursday) in the Washington, DC area.

## 5.0 Appendices

- The Co-Chairs commended the Panel for being task oriented and completing the Panels' work in two days, rather than in three days as originally planned, and said, "We are impressed by your contributions and gratified that you all have participated in this process. Thank you for everyone's excellent input."

The meeting adjourned at 3:00 PM.

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I \_\_\_\_\_/s/\_\_\_\_\_ (Laurence W. Zensinger, Designated Federal Official), this 31<sup>th</sup> day of August, 2001, hereby certify that the Summary Meeting Notes and attachments accurately describe the matters discussed and resolutions made, by the Expert Panel on Cost Estimating for the Public Assistance Program.

**5.4 September 26, 2001 Agenda**

**2<sup>ND</sup> MEETING OF THE EXPERT PANEL ON COST ESTIMATING  
FOR THE PUBLIC ASSISTANCE PROGRAM**

**LOEWS L’ENFANT PLAZA HOTEL  
480 L’ENFANT PLAZA, S.W.  
MONET IV CONFERENCE ROOM  
WASHINGTON, DC 20024-2197**

**September 26, 2001 (Wednesday)**

8:00 am	Welcome and Introductions	Laurence Zensinger Co-Chair and Designated Federal Official
8:15 am	Administrative Items & Review Agenda	Laurence Zensinger
8:30 am	ASPE Comparative Analysis Presentation	Kai ‘opua Fyfe
9:30 am	Break	
9:45 am	FEMA Comparative Analysis Presentation	J. David Duffer
10:45 am	Panel Discussion of Presentations	
12:00 pm	Lunch	
1:00 pm	Panel Discussion of Presentations Continued	
2:00 pm	Discussion Items:	J. David Duffer
	1. Recommended cost-estimating methodology.	
	2. Technical expertise and training guidance.	
	3. Engineering and design services (curves A and B).	
	4. Recommendations Report.	
	5. Additional Panel technical requirements.	
	6. Schedule next Panel meeting.	

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4:30 pm	Questions & Answers, and Comments from Members of the General Public	Expert Panel
5:00 pm	Adjourn	Co-Chair

## 5.5 September 26, 2001 Summary Meeting Notes



### **Federal Emergency Management Agency** **Summary Meeting Notes from Second Meeting** **of the Expert Panel on** **Cost Estimating for the Public Assistance Program**

September 26, 2001

**Loews L'Enfant Plaza Hotel**  
**Monet IV Conference Room**  
**480 L'Enfant Plaza, S.W.**  
**Washington, DC 20042**

#### **ATTENDEES**

##### **Panel Members**

Laurence W. Zensinger	Panel Co-Chair, Federal Emergency Management Agency (FEMA)
Robert L. Edelblut, Sr.	National Society of Professional Engineers
Claudette Ford	American Public Works Association (APWA)
Kai 'opua Fyfe	American Society of Professional Estimators (ASPE)
Charles Harper	American Institute of Architects
G. Michael Hoover	Associated General Contractors of America
Jon A. Oshel	National Association of County Engineers
Norman H. Roush	American Association of State Highway and Transportation Officials

##### **FEMA Technical Support**

J. David Duffer	Executive Officer of the Expert Panel on Cost Estimating, FEMA
James A. Walke	FEMA

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### Members of the General Public

Dick Buck	FEMA
Gary Dartlett	National Rural Electric Cooperative Association
Andrea Fisher	APWA
Robert Hobart	Fluor Federal Services (FFS)
Melissa Howard	FEMA
J. Brian Leap	FFS
Joseph Majewski	ASPE
Bill Manfredonia	ASPE
Melinda K. McDonough	FEMA
Jenny Novillo	Emergency Response Program Management Consultants (ERPMC)
Greg Ormsby	Nationwide Infrastructure Support Technical Assistance Consultants (NISTAC)
Beverly Perrell	ASPE
William Quade	ERPMC
Ken Rock	ERPMC
Charles Stuart	FEMA

### Background

The Disaster Mitigation Act of 2000 (Public Law 106-390), Section 406 (e), directs the Federal Emergency Management Agency (FEMA) to establish a methodology, consistent with industry practices, for estimating the cost to repair, restore, or replace eligible public facilities that are damaged during a major disaster. To accomplish this objective, FEMA established an expert panel (Panel), consisting of industry, State, and local representatives to recommend cost estimating procedures. A charter signed by the Director of FEMA on April 1, 2001 was filed with the General Services Administration's Office of the Committee Management Secretariat, per the requirements of the Federal Advisory Committee Act (FACA). The first meeting of the Panel was held in Arlington, Virginia on June 26 – 27, 2001 and was open to the public. The second meeting of the Panel, held on September 26, 2001, was conducted in Washington, District of Columbia and, like the first meeting, was open to the public.

The purpose of the second meeting was for Panel members to compare and contrast the Cost Estimating Format (CEF) for Large Projects developed by FEMA with estimating methods used by the American Society of Professional Estimators (ASPE). The Panel also selected and endorsed a cost estimating methodology and determined the level of technical expertise and training guidance required for uniformly applying it. Additionally, the Panel considered a proposed update to FEMA's Engineering and Design Services Curves (A and B) and the content of its Recommendation Report to the Director of FEMA.

### **Introductory Remarks**

Mr. Laurence Zensinger, Panel Co-Chair opened the meeting by welcoming participants and noting that Mr. Albert Ashwood, Panel Co-Chair of the National Emergency Management Association (NEMA) was unable to attend the meeting due to other NEMA matters requiring his attention in the aftermath of the September 11, 2001 terrorist attacks upon the United States of America. Mr. Zensinger stated that Mr. Ashwood expressed his personal acknowledgement and appreciation to each Panel member for their willingness to proceed with the peoples' business during such volatile and dangerous times.

Mr. Zensinger provided the Panel with a brief overview of FEMA activities at the World Trade Center in New York. He also provided a review of the previous Panel meeting and the action items that resulted from that meeting. In particular, he reviewed the Panel's request for a comparative analysis of FEMA's CEF with the cost estimating methods used by ASPE. Mr. Zensinger outlined other key goals of the meeting (Attachment A):

- (1) endorse a cost estimating methodology for estimating the cost of repairing or replacing a facility consistent with industry practices,
- (2) discuss the level of technical expertise and training guidance required to uniformly apply the recommended cost estimating methodology and instrument to maximize their accuracy and national applicability,
- (3) discuss the proposed update to FEMA's Engineering and Design Services Curves (A and B) and,
- (4) discuss the Recommendation Report and draft executive summary (that would be prepared based on the results of the Panel meetings) to include recommendations to the Director concerning procedures for cost estimating. In particular, Mr. Zensinger said that he wanted to talk about the tone of the report and to be sure all Panel members are comfortable with it. He reminded the Panel that the overall

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objective of FEMA's effort is to use an estimating methodology that will allow it to cut red tape and more quickly meet the needs of applicants.

With regard to meeting protocol, Mr. Zensinger said that comments from the general public would be welcomed at the end of the day. He added that in response to the Panel's request, there would be two presentations:

- A presentation by America Society of Professional Estimators (ASPE) of its analysis of a comparison of the two methodologies; and
- A review by the Federal Emergency Management Agency (FEMA) of the result of its comparative analysis of the CEF and ASPE cost estimating methodologies.

Mr. Zensinger then welcomed Mr. Jon A. Oshel of the National Association of County Engineers and invited panel members to reintroduce themselves to one another.

### **ASPE Presentation Comparing the CEF to ASPE's Level 3 Estimate**

Kai 'opua Fyfe gave a presentation on behalf of the American Society of Professional Estimators (ASPE) summarizing its views on the Cost Estimating Format (CEF) for Large Projects being used by FEMA. Mr. Fyfe noted that, in his opinion, the CEF conforms with recommended estimating practices. However, he made it clear that his remarks be considered preliminary, because the Board of Directors, Technical Boards and Standing Committees had not yet formalized the Society's findings. National meetings, which had been scheduled to complete that formalization, were postponed due to post-9/11 travel difficulties. With this caveat, Mr. Fyfe said that while there is lots of strong support for the CEF, most cautionary ASPE comments have centered around two topics:

- The need for appropriate expertise of the personnel performing the estimates; and
- Quality of the construction document data that directly affects the level of detail included in the estimate. While most reviewers like the use of the Microsoft Excel workbook in Part A of the CEF, they would prefer to use historical, and/or local cost data, rather than factored national cost data from commercial estimating manuals; and the utilization of estimating expertise from the vicinity of the disaster, where possible. This allows factors to be developed on-site, at the same location where the work would be done. Regarding the ASPE level 3 estimate, that level is not designed to require sufficient construction documentation to attain the ideal +/-10% range of eventual firm bids.

Joseph Majewski, the President of ASPE, spoke at the request of Mr. Fyfe and with the Panel's permission. Mr. Majewski indicated that ASPE's Manual stresses the need for sound judgment when preparing an estimate. The Manual helps educate others on how to prepare a reliable and valid estimate. He added that everything from a house to a nuclear power plant uses all 16 Construction Specifications Institute (CSI) trade categories (divisions) that the CEF is based upon.

Mr. Fyfe assured the Panel that the formal ASPE findings would be provided as soon as possible.

### **General Discussion**

The Panel agreed that the ASPE Manual emphasizes uniformity, ethics, and sound judgment. The Panel also agreed that there was no need to prepare every estimate as though it would wind up in litigation. There also was agreement that developing estimates in rural areas require flexibility, but if properly researched and documented, it is possible to develop a reliable estimate of what a project "should" cost without local data.

However, it was recognized that it might be difficult even for a professional estimator to make valid cost estimates in rural areas. Estimates for rural roadway projects, for example, may be "all over the map." Often, if all bids are high in a rural area relative to construction costs expected for a given project, the project is withdrawn and rebid at a later date with cost refinements reflected in the engineer's estimate. More over, due to the immediate need to restore critical infrastructure to respond to and recover from the effects of disaster, the rebidding solution normally used for capital improvement projects is not practicable.

Panelists were pleased with the generally strong support of the CEF provided by ASPE. They were gratified with the anticipation that the large group of reviewers provided by ASPE would validate what the Panel concluded at the previous meeting.

### **FEMA Presentation Comparing the CEF to ASPE's Level 3 Estimating Approach**

J. David Duffer, FEMA, presented the results of FEMA's comparative analysis of the Cost Estimating Format (CEF) for Large Projects to ASPE's Level 3 estimating approach (Attachment B) as prepared by the Standards Board of ASPE in its publication Standard Estimating Practice (ASPE, 5<sup>th</sup> edition, October 1998). ASPE's Level 3 estimate is a "Design Development / Budget Appropriation" level prepared from not less than 25 percent complete preliminary design drawings and draft specifications. The purpose of this estimate is to establish probable costs within the range of available information. Mr. Duffer also addressed whether a CEF estimate at an ASPE Level 3 would be comparable

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to an ASPE Level 5 estimate, plus or minus 10 percent (the thresholds selected by the Panel for any estimating process).

Mr. Duffer noted that a clear definition of the scope-of-work, the level of completion of the A&E effort, the estimating technique employed, and the skill of the estimator or estimating team govern the accuracy of any estimate. Estimates range in scope and detail from order of magnitude to firm fixed price contractor bids. The former are based on preliminary information while the latter are based on a complete set of plans and specifications.

CEF is a procedure to estimate eligible grant funds for reimbursement of expenses to an eligible applicant. Estimates prepared using the CEF (Instructional Guide, Version 2, October 1998) parallel the Construction Specifications Institute (CSI) Divisions of Work. The key element of the CEF is Part A and it is to be itemized to the greatest extent possible. Local pricing is brought into Part A, consisting of completed work, bid, or local costs, before going to R.S. Means cost data. Parts B through H reflect the estimator's confidence in the completeness of the Part A costs. In other words, local cost data is incorporated in Part A and parts B-H are zeroed out. If local cost data is unavailable for any of the work components, the appropriate parts (B-H) are then selected and factored into the estimate. When we have total confidence in Part A there is no need to use Parts B through H of the CEF. However, the factors used in Parts B-H are based on industry standard source data obtained from R.S. Means and the American Society of Civil Engineers. This is appropriate because the factors are generally only applied when the estimate is R.S. Means based and should be applied only when other data are not available (such as applicant provided historical cost data, an applicant's bid documents, or other average-weighted unit costs from an applicant, etc.). CEF training emphasizes the hierarchy of cost data selection, with local costs used first and FEMA cost codes used only as a last resort.

To perform the primary comparison of CEF to an ASPE Level 3, the documentation and design development criteria for both estimating methods were detailed. The supporting documentation and criteria were then compared and the similarities and differences summarized. Generally the requirements for both estimating methodologies are very similar. Site plans, dimensions, arrangements and schematics are required for both. ASPE also requires detailed preliminary plumbing, mechanical and electrical drawings as a requirement. This level of detail is not explicitly defined as a requirement of the CEF. Requirements for both methodologies are generally quite similar, even though the two are NOT directly comparable. The CEF focuses on costs to return damaged eligible facilities to their pre-disaster condition. In this regard, FEMA's CEF parallels the performance objective of ASPE Level 3. Under post-disaster conditions, a CEF estimate will compare favorably with other cost estimating methodologies (e.g., Building Construction

Handbook, 2nd ed., 1975, McGraw-Hill Book Company; United States Department of Energy, Cost Estimating Guide, DOE G 430.1-1, Chapter 11, Maximum Upper Limit Values; Association for the Advancement of Cost Engineering, Cost Estimate Classification System, Recommended Practice No. 17R-97; etc.) and produce an estimate of approximately the same magnitude and confidence level.

The results of FEMA's review of ASPE Estimating procedures (Levels 1 through 6) and their purpose and comparison to the CEF found that, indeed, the CEF process does parallel the ASPE Level 3 process in: (1) level of contingency (design phase scope contingency), and (2) the type and level of design documentation required. FEMA's review also found that other cost estimating approaches allow for use of factors and that the CEF Factors can be adjusted in the field based on the characteristics of specific disasters. Although ASPE's method does not specifically incorporate factors in the estimate, and indeed allows a percentage to be used for general conditions only in levels one and two, standard estimating industry practice often involves adding a percentage of base costs to a number of items needed to put together a total cost estimate (e.g., construction cost contingencies, reserve for change orders, overhead, profit, etc.).

Mr. Duffer noted that CEF accuracy is dependent on the information available at the time of the preparation of the estimate. Repair work or other discrete work elements should generally be well defined during the initial field inspection. Retrofit/upgrade and/or hazard mitigation efforts will not be fully established until design is started or completed. If new construction is anticipated, (especially when making a repair versus replacement analysis) this will ultimately require extensive design that will not be available when the CEF is initially prepared. A combination of work types would still make the CEF parallel to an ASPE Level 3 estimate. Mr. Duffer also noted that to ensure a high level of confidence in the estimate, a clear definition of the scope of work is required, along with active participation by the applicant. To meet the ASPE level 5 criteria using the Panel's plus or minus ten percent thresholds, the Panel could consider refining the qualification criteria to include all large permanent work projects (e.g., apply the 10 percent plus and minus criteria) on the basis of all work being done for an individual applicant, rather than on a project-by-project basis. In his remarks, Mr. Duffer concluded that the CEF falls well within the range of other industry accepted cost estimating systems. He noted that the CEF Instructional Guide, Version 2 (November 1998) would need to be updated to include lessons learned in the field.

### **General Discussion of FEMA's Presentation**

There was considerable discussion about the timing of estimates. Even in the aftermath of a disaster, there is a need for FEMA to work closely with the State when inspecting sites and developing estimates. Technical personnel (e.g., engineers, architects, etc.) are

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required to meet with applicants who have suffered disaster damages. FEMA needs to get people out there quickly who know how to estimate and who know how to relate to the local people. There was general consensus about the need for applicant participation in the estimating process, as well as the need for qualified estimators (i.e., a team approach).

With regard to the quality of Project Officers, FEMA makes a preliminary determination after each disaster about the number of estimators and the areas of expertise required for the work. In response to questions about the qualifications and training required for estimators, FEMA indicated that different levels of expertise might be needed for different types of projects. Some projects, like culvert washouts, are relatively simple and a Civil Engineer with road and bridge experience would normally be used. Other projects require significant, more specialized technical expertise (e.g., a geotechnical engineer to estimate the eligible costs for repairing landslides).

The character and knowledge of individual estimators (i.e., POs, and Public Assistance Coordinators, or PACs) are very important. They need to have very high ethical standards. While all participants agreed that the training and qualifications of estimators is important, clearly not everyone has the same level of training and experience. FEMA must make an initial judgment about the level and mix of technical expertise it sends to a disaster. This initial judgment may need to be modified, as more information about damages becomes known. It was noted that FEMA does not have control over personnel the States send out to work with FEMA on the response and recovery process.

Panelists were interested in the disparity between larger urban applicants and smaller rural applicants who may be unable to provide the participating local funding match required by the State. They believed that FEMA should try to be more compassionate than most insurance companies. FEMA responded that while one of its goals is to develop a more robust communication methodology that will work for the applicants to let them know about the resources at their disposal, the Stafford Act is quite explicit on the extent of supplemental assistance that FEMA can direct towards an eligible applicant for eligible work. FEMA recognizes that projects with a predisposition toward known problems (such as geotechnical flaws, hidden building damage, differing site conditions, etc.) need to be able to include appropriate architectural and engineering expertise for the contemplated work effort as may be required. Efforts such as these must be done early in the evaluation process, before the CEF is used and the Project Worksheet completed.

Panelists noted that FEMA should think broadly about the scope and content of its training. There is a need for applicants and their staff, and State personnel, to receive training about Project Worksheet documentation requirements and the recovery process early in the response effort. Training in the immediate aftermath of a disaster is not

always possible to do. Sometimes even small initiatives can make a big difference in qualifying projects for funding. For example, basic “field etiquette” is needed, such as providing a scale for the disaster damaged object being photographed, depicting which direction is North, and explicating the essential elements of information necessary for a fully-defined undertaking as contemplated by the applicant, etc. In response, FEMA explained that it had redesigned the PA Program to provide money to applicants more quickly and to make the application process simpler than before. The redesigned PA Program was approved for implementation on disasters declared after October 1, 1998. A Final Rule was published in the Federal Register on October 12, 1999 (at 64 FR 55158) to reflect the changes that FEMA needed to put the new Public Assistance Program into effect. Specific changes to Title 44 of the Code of Federal Regulations - Part 206 include renaming documents, defining terms, adjusting responsibilities, and editing the rule in a way that makes the rule easier to read and understand. The PA Program provides the basis for consistent training and credentialing of staff (people) who administer the program; more accessible and understandable guidance and policy for participating in the grant program; improved customer service through a more efficient grant delivery process, applicant-centered management, and better information exchange; and continuing performance evaluations and program improvements. But these matters are more germane to providing money to applicants, rather than developing cost-estimates. The Panel agreed, and for the purposes of the Federal Advisory Committee, recommended that training be limited to the selected cost estimating methodology and an Emergency Management Institute (EMI) resident CEF course offering, be made available to both Federal and State staff at the National Emergency Training Center in Emmitsburg, Maryland, based on the current CEF course and training materials used by the Disaster Field Training Organization (DFTO).

One panelist expressed concern that public agencies are at a disadvantage because they cannot attract and retain qualified people to develop estimates, because they compete with the private sector that can afford to hire the best. Hiring a permanent cadre of fully trained estimators will take a long time and be costly.

FEMA also explained that while it was possible to have its own cadre of full-time cost-estimators, the current level of funding made it highly unlikely. Instead, FEMA relies on a large group of technical assistance contractors (TACs) that have access to personnel who do frequently engage in cost estimating for all types of infrastructure work. The problem FEMA faces is that the disaster workload fluctuates continuously. To obtain full-time employees, FEMA needs to be able to justify keeping them busy all the time. It currently has the tools it needs to accomplish the job -- determining minimum qualifications, and using a combination of permanent- and disaster cadre staff, supplemented by TAC personnel, to provide appropriate resources for each disaster. In general, FEMA is able to identify the requirements it needs, articulate those needs to a

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highly qualified pool of personnel (including TAC), and obtain the necessary resources whenever and wherever they are needed.

Panelists agreed that FEMA's existing cost estimating methodology (i.e., the Cost Estimating Format for Large Projects) is the recommended procedure for estimating the cost of repairing, restoring, reconstructing, or replacing a facility consistent with industry practices, based on each Panelists' independent peer review and the joint-Panel deliberations undertaken to date.

The Panel also acknowledged that while all personnel are not equally qualified, they should be able to get the mission completed with proper training provided at either the DFTO or EMI level. The Panel suggested that training at the Emergency Management Institute (EMI) was preferable to training at a Disaster Field Training Office (DFTO), because of concerns with the environment (i.e., the DFO is conducive to disaster response and recovery operations, while EMI is conducive to learning). Panelists' also cautioned that FEMA and TAC personnel also have the responsibility to be aware of their own professional limitations, and this should be emphasized during the CEF resident course offering at EMI. The Panel concurred that a full-time cost estimating cadre is not required, as long as FEMA has immediate access to qualified personnel when needed. Panelist's agreed that FEMA personnel should only work within their area of expertise and agreed that establishing a person's work experience before utilizing their skills, could assist Public Assistance Coordinators (PACs) in better utilization of available technical expertise from the Federal/State resource pool. The Panel also agreed that when the updated Engineering and Design Services (Curves A and B) were received, that the CEF for Large Projects Instructional Guide, Version 2 (November 1998) should be updated to include lessons learned from the field and curves A and B.

One panelist observed that the lower-bound percentile of 15% used for simple projects in the CEF for Large Projects Instructional Guide, Version 2 (November 1998) relating to the Part C.1: Standard Design-Phase Scope Contingencies factor, did not accurately depict the actual risk of bidding a simple project.

FEMA explained that the level of completion of A&E work as a function of time can characterize the construction and the C.1 factor is designed to account for these unknowns. The unknowns gradually decrease as the scope of work is defined, details for completing the work are developed, and the project advances towards a set of construction drawings and specifications that can be used by a construction contractor.

Two levels of design development are currently considered in C.1, as follows:

Preliminary Engineering Analysis Stage: At this stage, concepts have been developed, usually without a significant level of detailing. It is difficult to accurately

quantify work at this stage, and contractors would assume a relatively high level of risk in bidding a project at this time. A recommended range of 15 to 20 percent is established to allow some differentiation between simple and more complex projects.

Working Drawing Stage: At this stage, the design is more advanced, concepts have been determined, detailing is more complete, and work tasks and quantities have been readily defined. Contractors would assume a low to medium level of risk in bidding this type of project. The recommended range of 2 to 10 percent allows for some differentiation depending on the level of completeness of working drawings. A project in the preliminary working drawing stage, which would have an average level of detail and readily identifiable quantities, should be assigned a factor at the upper end of the range. A project in the final working drawing stage should be assigned a factor at the lower end of the range.

Panelists agreed that the project should be evaluated to determine the design phase at the time the estimate is prepared and that it is important to note that the C.1 contingency is intended to represent the state of the project design development at the time that the CEF is prepared. Additionally, the Project Officer responsible for developing the estimate should obtain all information necessary to prepare the CEF for the current state of project development. However, it is the sense of the Panel that the lower-bound percentile for simple projects is more realistically on the order of 7% and the C.1 factor should be revised to reflect this percentile.

### **Conclusion and Suggestions**

Each Panelist voted on the behalf of their respective professional organizations. They unanimously endorsed the Cost Estimating Format (CEF) for Large Projects, Version 2 (November 1998) and selected the CEF as the recommended cost estimating methodology of the Public Assistance Program. With the formal vote completed, the Panel elected to move directly into making specific suggestions intended to improve the overall quality of the CEF implementation. The following are representative of the key comments made during the discussion:

- The Public Assistance Officer (PAO) needs to be able to determine the correct type of expertise required for each large project. If the required resource is not readily available, the PAO should have the skills necessary to obtain the correct type of expertise, as needed, for all large project types. The process would be similar to the mechanism that FEMA uses when there are Special Considerations issues, such as historical preservation, environmental, or insurance issues, etc. The PAO must have the ability to inject appropriate expertise anywhere in the large project formulation process as needed.

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FEMA Response: FEMA often sends in a TAC Liaison to work with a PAO to determine what type of technical expertise is needed for a large project and when. In this regard, the Panel agreed with FEMA's approach.

- There is an overriding need to include PAOs and PACs in the CEF process. This step is essential in getting them to understand and support the process. Applicants and State staff also should be able to participate and get properly trained in the use of the CEF.

FEMA Response: Training was performed for the Nisqually Earthquake disaster in Olympia, Washington and for the floods in Houston, Texas with very good results. Excellent feedback was received from both State and applicant participants. FEMA agreed with the Panel's suggestion.

- Cost estimating expertise is out there in the field already. FEMA needs to be able to identify it and tap into it as needed. Cost-estimators do not necessarily have to be on the site; the key is to be able to access discipline-specific expertise. Often, the cost estimating specialists may be able to telecommute.

FEMA Response: FEMA noted that its TACs have the capability to procure technical resources relatively quickly to respond to disaster needs. The Panel agreed with FEMA's approach.

- The first estimator to visit a damaged facility needs to be a well-rounded seasoned professional, generally qualified in the entire spectrum of construction, including environmental, historical, and insurance issues. This person will then identify and call for specific types of expertise, when needed (e.g., structural engineering, demolition, brickwork, etc.), and should probably be a FEMA employee, not a contractor. FEMA really needs people familiar with demolition and hauling, earthwork, cofferdams, parks and recreation areas, paving, etc. It can still rely heavily on contractors once these important base items are covered. FEMA agreed with the Panel's suggestion.

*-- lunch break --*

### **Engineering and Design Services (Curves A & B) Status**

J. David Duffer, FEMA, presented the results of his review of Engineering and Design Services Curves A and B (used for determining the percentage of Engineering and Design Services for a large project) as requested by the Panel during the first meeting of the Expert Panel on Cost Estimating for the Public Assistance Program. During the first meeting, Panel members asked FEMA to procure data from the National Society of

Professional Engineers (NSPE), the American Institute of Architects (AIA), and the American Consulting Engineers Council (ACEC) as it relates to a proposed update to curves A and B. Curve A represents compensation for basic services expressed as a percentage of construction cost for projects of above average complexity and non-standard design, and curve B represents compensation for basic services expressed as a percentage of construction cost for projects of average complexity.

All three professional organizations responded and acknowledged that neither NSPE, AIA or ACEC had ever developed this kind of data; they only knew of the American Society of Civil Engineer's (ASCE) Manual 45 entitled: "Consulting Engineering: A Guide for the Engagement of Engineering Services".

According to ASCE, the existing Engineering and Design Services Curves that FEMA uses were initially developed in 1975 based on a nationwide survey of architectural and engineering (A&E) firms and were published in the first edition of Manual 45. In 1982, a nationwide survey of A&E firms was performed and updated curves were developed. In 1988, the 2<sup>nd</sup> edition of Manual 45 was published, but did not include the 1982 updated curves, because A&E firm's generally believed the curves would limit the fee structure established by some A&E firms. This matter was discussed at the highest levels of ASCE, to include the Office of the President. In 1996, the 3<sup>rd</sup> edition of Manual 45 was published, but did not include curves A and B for the very same reason previously cited. In 2001, the ASCE Committee on Professional Practice meeting was conducted in San Antonio, TX on November 10 and 11, 2001. The committee considered curves A and B for inclusion in the 4<sup>th</sup> edition of Manual 45 contemplated for publication in early 2002, based on a nationwide survey of A&E firms performed this year.

The chairman of the Committee on Professional Practice will provide curves A and B to FEMA, subsequent to the ASCE meeting in San Antonio, TX, whether or not the curves are included in the 4<sup>th</sup> edition of Manual 45. There was a general consensus among the Panelists, that the 1975 curves still being used by FEMA are lower than current engineering and construction costs. This was not important before CEF when A&E costs were adjusted to reflect actual eligible expenses. However, under CEF, a better estimate of A&E costs is necessary.

### **Expert Panel Comments on the Recommendation Report to Director**

J. David Duffer, FEMA, distributed a rough draft of a summary Recommendation Report to the Director of FEMA with the caveat that it would be revised to capture the key Panel recommendations made during today's meeting. Panelists unanimously agreed that most of the concerns discussed in today's meeting had been previously addressed in the CEF and noted that the process is founded on an established methodology that allows the PAO

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to determine the appropriate level of expertise needed on a disaster, and engages applicants early in the decision-making process when their input matters most.

Additionally, Panelists agreed that the report should be rather brief, include pertinent graphics and other exhibits, and not turn into a long document. They further indicated that the CEF procedure would be superior to the base cost estimating methodology that is being used and has been used in the past. They recognized that the CEF could be modified in the future as FEMA gains more experience with it and cost data is made available to statistically analyze it, determine correlations if possible and assess its performance. Two specific issues were identified that Panelists desired to be addressed in the report:

- The level of effort used to prepare an estimate. The concern was that it's usually best to take a little more time preparing the estimate at the outset. This improves the chances that it will not have to be revisited in the future.
- The role of the Applicant in developing the estimate. Working with the applicant early on in a disaster to discuss and agree on the scope of eligible damages would be quite helpful in reducing the need for change orders.

### General Discussion

- One Panelist indicated that FEMA should group all large projects by applicant on a disaster and reconcile actual large project costs as a group, to achieve the targets of plus and minus 10 percent. Another possibility is to aggregate projects at the community level (e.g., by city, township, municipality, etc.) regardless of the applicant. However, FEMA should still retain individual project data for the record.
- There is some concern about what to do when there are only one or two bidders, as is common in a small community, because a competitive bidding environment is normally not present. There was discussion about whether FEMA needs to establish some sort of a "rider" to allow special consideration for small, rural communities. Some panelists agreed with the concept of a rider; others felt that there is no need for a rider, as long as actual local costs are applied in place at the time of the disaster. In small communities, some actual costs could be as much as 20 or 30 percent higher than the costs of similar work in large communities.

FEMA Response: FEMA noted that in the case of a small community, it would act in good faith and recognize a small community's financial constraints early on in the process and estimate accordingly. FEMA also noted that it is best to ask for assistance as soon as possible after a disaster and for the record, that it would

make a special effort in small, rural communities to use local prices wherever possible. FEMA acknowledged that there may not always be a competitive bidding environment in small rural communities, including some situations where the “low bidder simply does not show up.”

Panel Recommendation: Collect and retain cost data for each project for use in analyzing results. FEMA should then incorporate CEF data into its computer system (e.g., NEMIS or a statistical analysis package, etc.) to be able to access it for analysis.

FEMA Response: FEMA indicated that it would take at least a few years to procure enough data from the Nisqually and Houston disasters to see how well the CEF performs. FEMA also is planning to use the CEF in New York for the disaster at the World Trade Center. Ultimately, some years down the line, FEMA would like to process large project grants on the basis of cost estimates alone, but acknowledged that data analysis would be required.

### **Next Steps**

FEMA asked the Panel to consider what its requirements might be for future Panel deliberations. FEMA indicated that, with the Panel’s concurrence, it would consolidate their comments into a draft Recommendation Report and circulate it to Panel members for their review. Based on the comments, FEMA would then check with Panelists and determine if there is a need for another meeting. There was consensus among the Panelists that while the decision to meet again should remain open, there is no need to meet in relation to the tasks completed to date as depicted in the Panel’s Federal Advisory Committee Charter. FEMA asked for volunteers from the Panel to write a rough draft of the executive summary to set the desired tone of the Recommendation Report to the Director, and the Panel unanimously agreed that J. David Duffer, FEMA’s Executive Officer would draft the Recommendation Report on behalf of the Panel.

The Panel agreed that 30 days for review of the draft report would be sufficient. There was agreement to use e-mail messages wherever possible to transmit electronic copies of the draft Recommendation Report so that comments could be finalized and appropriate revisions made to the report. One suggestion was to use the tracking mechanism under MS Word to make comments and to implement agreed upon changes to the report.

### **Closing Comments by Panelists and Members of the General Public**

- Kai ‘opua Fyfe: Remember, at the beginning of the disaster response, FEMA needs to send a person who is qualified in cost estimating to determine the types of technical expertise required for estimating large project costs on a disaster. ASPE thinks that ASPE certification qualifications are sound, especially since

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they have continuing education requirements. One of the requirements for application to the ASPE Certification Program is a minimum of 5 years experience doing estimating. Kai is willing to look at ASPE tools and documents to see what may be useful to FEMA, but does not think that a certification requirement is necessary for all FEMA estimators. Estimator expertise can also be evaluated by utilizing traditional employment industry search tools.

- John Oshel: Lots of our work is bread and butter that certainly will not require a fully certified estimator.
- Larry Zensinger: Increased exposure to the educational materials would certainly be appropriate for FEMA folks.
- Melinda McDonough: There was Panel discussion relating to the refining of the CEF process qualification criteria, in order to achieve the ASPE level 5 criteria using the Panel's selected plus or minus ten percent thresholds, but a Panel consensus was not explicitly reached. In order to evaluate FEMA's cost estimating performance against the Panel's thresholds, did the Panel decide to group all of an applicant's large permanent work projects together, rather than reconciling costs on a project-by-project basis?

*Answer:* Panelists discussed this important distinction and agreed that cost reconciliation and the subsequent comparison of the actual eligible costs against the selected plus or minus ten percent thresholds would be done on a project-by-project basis. Mr. Duffer thanked Ms. McDonough for bringing this important matter to the attention of the Panel and noted that the Panel's subsequent recommendation would be incorporated in both the Panel's record and the Recommendation Report to the Director of FEMA.

- J. David Duffer: Based on the previous discussion, it should be made clear that for the purpose of the plus or minus ten percent threshold comparison to actual eligible cost, only the CEF estimate line item of the Project Worksheet (PW) could be compared to like costs derived from the total actual eligible cost. Often, the PW contains other line items of eligible work activity not normally contained within the CEF estimate, such as, salvage value, depreciation, insurance adjustments, anticipated insurance settlements, etc. Therefore, the threshold comparison to actual eligible costs must be made on the same line items of work defined in the CEF estimate, and not the total actual costs for the PW.

*Answer:* The Panel discussed and agreed with Mr. Duffer's observation and recommended that the proposed CEF data procurement process within the Public Assistance module of the National Emergency Management Information System

be designed to consider direct tracking and resultant comparison of like work activities between the CEF estimate and actual eligible costs, and eliminate the potential for comparison of non-like work activity.

**Closing Administrative Comments**

In closing, Larry Zensinger noted that the Panel shall function on a continuing basis in accordance with the authorizing statute unless terminated by appropriate legislative authority. The Panel will meet not later than one year after the date of promulgation of regulations by FEMA, three years after that date and at the end of each two-year period. The purpose of these meetings is to examine the appropriateness of the adopted cost estimating procedure and to periodically submit a report to Congress on the Panel's findings.

Mr. Zensinger thanked all the Panelists and members of the general public for participating in the meeting and complimented the Panel for being a first-class, collegial group. Mr. Zensinger also noted that the Panel's objectives as depicted in the Federal Advisory Committee Charter had been successfully achieved.

The meeting adjourned at 4:00 PM.

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I \_\_\_\_\_ /s/ \_\_\_\_\_ (Laurence W. Zensinger, Designated Federal Official), this 30<sup>th</sup> day of November, 2001, hereby certify that the Summary Meeting Notes and attachments accurately describe the matters discussed and resolutions made during the second Federal Advisory Committee Meeting of the Expert Panel on Cost Estimating for the Public Assistance Program.



## 5.6 Recommended Cost Estimating Procedure

The following summarized procedures, are recommended by the Panel, for estimating the cost of repairing, restoring, reconstructing, or replacing a facility consistent with industry practices, for the Public Assistance (PA) Program:

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288, as amended), authorizes the Federal government to assist State and local governments with recovery from disasters. In accordance with this legislation, which is referred to as the Stafford Act, State and local governments and certain private non-profit organizations may receive financial assistance to repair or replace disaster-damaged public facilities and other infrastructure components. The Federal Emergency Management Agency (FEMA), in partnership with State governments, is responsible for managing the provision of this assistance under the Public Assistance Program.

Through the PA Program, FEMA pays the Federal share of the cost of repair or replacement of a facility as it existed prior to the disaster. The estimate of this cost is determined by a team of Federal and State technical specialists working in cooperation with a representative of the State or local government entity applying for the assistance (the applicant). For large projects<sup>1</sup>, this estimate is used to determine the initial Federal obligation of funds for the work, but it is not necessarily the final cost that will be approved for the project. Rather, the final cost is based upon the reasonable, actual costs incurred by the applicant in completing the eligible scope of work. Actual costs are determined through a reconciliation process initiated by the State when the work is complete. Discrepancies between the initial estimate and the final cost are reconciled through the obligation (or de-obligation) of Federal funds.

The Federal-State team typically prepares the initial construction estimate using the best available unit cost data for the elements of the facility requiring repair or replacement. These unit costs (also referred to as “construction costs”) represent the itemized breakdown of construction work activities for completing the project. The unit costs usually do not include project design and management costs, contractor overhead and profit, fees, cost escalation due to inflation, and other factors affecting the overall cost of the project. These costs (also referred to as “construction-related costs”) are addressed through the reconciliation process once the project is complete. While the applicant may eventually receive reimbursement for these costs, the final amount of the grant is

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<sup>1</sup> The Stafford Act provides for separate grant processes for small and large projects and set the minimum threshold for large projects at \$35,000 when it was passed in 1988. FEMA adjusts this amount at the beginning of each Federal fiscal year to reflect changes in the Consumer Price Index for All Urban Consumers. For Federal Fiscal Year 2002 (ending September 30, 2002), the large project threshold has been set at \$52,000.

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unknown at the time of construction. Further, the grant is subject to review during the reconciliation process, and the outcome of this review can affect the amount.

To provide the applicant with a better representation of actual costs at the beginning of the assistance process, the Cost Estimating Format (CEF) for Large Projects was developed. The CEF was designed to capture not only direct project-related costs, but indirect project related costs as well. Construction costs are unit costs (or base costs), such as reinforcing steel or concrete that will be used in the restoration of a structure. Construction-related costs (interchangeably referred to as parts or factors), which may not always be included in the initial estimate, include design and project management costs, contractor overhead and profit fees, cost escalation due to inflation, and other factors such as plan check fees and construction permits affecting the overall cost of the completed project. By including all construction and construction-related costs (i.e., base costs and parts or factors) in the initial estimate, a more accurate estimate of total project costs is determined before work is begun. Additionally, the accuracy of the cost estimate is important for construction planning, budgeting and management purposes.

### **The Development of the Cost Estimating Format (CEF)**

The concept of the CEF was first designed and developed for use in the Public Assistance Program at the Northridge Earthquake Long Term Recovery Area Office in Pasadena, California. James D. Duffer, serving as the Public Assistance Officer and Infrastructure Chief for the Northridge Earthquake disaster, resourced and provided first line supervision to the production team that calibrated the methodology. These efforts contributed to the transformation of the traditional FEMA methods used to estimate costs for large projects into a uniform and credible standard of customer service. Repair and replacement costs for Category E facilities damaged during the 1994 Northridge earthquake were estimated using an early version of the CEF and final grant offers were made to applicants on the basis of those estimates under the Grant Acceleration Program (GAP). FEMA developed the GAP to aid in reaching administrative closure on Los Angeles, California's Northridge Earthquake (DR-1008) projects. The GAP was designed to establish a single fixed project cost amount for all eligible work, including contractor's markup, reserves for standard change orders, architecture and engineering design, and owner's management costs. GAP used a CEF-based estimate of total project costs that established a fixed level of funding based on R.S. Means cost codes to cover the eligible scope of repair/recovery to the damaged facility, plus (as applicable) industry standard factors to account for construction project risk, as well as standard industry markups. The factors are also derived from R.S. Means.

The settlement offer was based upon a cost estimate performed by FEMA using the CEF, which was developed to simplify and systematize the determination of these markup

factors in a manner consistent with industry practice. The grant provided under the GAP was a fixed sum when an eligible applicant signed the GAP offer. Any cost over-runs were the applicant's responsibility and the applicant agreed to give up their right to appeal or request supplemental project funding. If a project proved to be more economical than the GAP offer, the applicant could utilize the unspent balance for approved Section 406 hazard mitigation projects on the same facility.

### **Current Implementation of the CEF**

A new version of the CEF<sup>1</sup> has since been developed and has also been tested, peer-reviewed, and published during the redesign of the Public Assistance Program in Hyattsville, Maryland under the management and leadership of James D. Duffer, Project Officer of the CEF effort and Deputy Director of the Public Assistance Program redesign.

The new version of the CEF was designed for all types of infrastructure damage, for all types of disasters. This version of the CEF was tested against cost data from large project closeouts, and by May 1998 had undergone a peer review by a group of construction, engineering and cost-estimating industry experts consisting of Fluor Daniel, Incorporated (both its engineering and construction divisions) and the American Society of Civil Engineers who evaluated the methodology, substantiated component factors, and recommended improvements necessary to apply the CEF nationally. These recommendations were subsequently incorporated into the cost estimating instrument and the CEF Instructional Guide.

This version of the CEF was first used in the pilot of the redesigned Public Assistance Program that was conducted in the State of Kentucky during a combined tornadoes and flooding disaster in April of 1998, and since then, the Nisqually Earthquake, the Cerro Grande Fire, the Houston Flood of 2001, and the World Trade Center Terrorist Attack in New York City, etc., to estimate repair and replacement costs of damaged facilities.

### **Components of the CEF**

The CEF provides a worksheet, called Part A, which permits the user to estimate the base construction costs, using local cost data such as, completed project costs or a comparable bid tab, applicant-provided local cost data or cost history, or local average weighted unit prices, etc. A series of factors (Parts B through H) that represent construction-related costs are then applied, as appropriate, to the Part A base construction cost to estimate the total cost of completing the project. This “forward-pricing” methodology provides an estimate of the total eligible funding at the beginning of the project. This estimate, which

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<sup>1</sup> Cost Estimating Format (CEF) for Large Projects, Version 2 (November 1998)

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is used to obligate the funds for the project, allows the applicant to more accurately manage the budget with a greater degree of confidence.

Regardless of the type of cost data used in Part A, Parts B through H are R.S. Means-based factors (a supplier of construction cost information) that represent construction-related costs that are directly connected to the project. *It is therefore critically important that the cost estimator determine all elements that make up the unit costs itemized in Part A that could potentially be duplicated in Parts B through H, thereby resulting in an inflated project cost.* For example, if the work is completed and actual costs are known and itemized in Part A, the user does not apply Parts B through G. Conversely, if local cost data is unavailable and R.S. Means cost data is used to itemize work activities in Part A, the user may apply one or more of the Parts B through H factors.

Table 1 below, depicts the hierarchy of preferred pricing with completed work costs or local cost data favored first and FEMA cost codes favored least. FEMA cost codes are not depicted in Table 1 for this reason. The construction-related costs represented by Parts B through H are usually encountered during the course of construction and can normally be expected to occur. *In all cases, the cost estimator is responsible for determining the make-up of the unit costs used in Part A, before applying one or more of the Parts B-H factors so that cost duplication of work activities previously considered in Part A are eliminated.*

CEF Part	Types of Costs Used in Part A and Typical Application of Factors			
A	Completed Work	Bid Tab	Local Cost Data	R.S. Means Cost Data
B	*	*	*	Y
C	*	*	*	Y
D	*	*	*	Y
E	*	*	Y	Y
F	*	Y	Y	Y
G	*	Y	Y	Y
H	Y	Y	Y	Y

Y = Part or Factor Normally Applied

\* = Part or Factor Normally Not Applied

Table 1

The CEF provides a more uniform method of estimating costs for large projects and accounts for costs incurred across the entire spectrum of eligible work (from design to project completion).

The parts of the CEF are listed below.

**Part A** is the estimated sum of construction costs, referred to as the base cost.

**Part B** includes construction costs, not typically itemized in Part A that facilitate the work. Part B includes such costs as the general contractor's field supervision costs and job site costs such as temporary services and utilities, safety and security measures, quality control and administrative submittals.

**Part C** reflects construction cost contingencies and is designed to address budgetary risks associated with project complexity in determining the scope of work. Part C factors are determined on the basis of the amount of design work completed at the time the estimate is prepared, the complexity of the project and the degree of difficulty for site access, storage, and staging.

**Part D** accounts for the contractor's home office overhead, insurance, bonds, and profit. *This factor is typically not used for projects completed using the applicant's labor, equipment and materials (referred to as "force account" work).*

**Part E** accounts for cost escalation over the duration of the project and is based upon an inflation adjustment from the time the estimate is prepared until the mid-point of construction for the eligible scope of work.

**Part F** includes fees for building permits, plan checks, and special reviews.

**Part G** is the applicant's reserve for change orders and differing site conditions.

**Part H** accounts for the applicant's cost to manage the design and construction of the project. These costs are not part of the statutory administrative cost allowance that is separately provided to the applicant under the PA Program to manage the overall recovery effort. The administrative allowance, which is authorized by the Stafford Act and is intended to defray the cost of requesting, obtaining and administering Federal assistance, does not account for project management costs.

These factors and recommended ranges were developed using guidance available from the Construction Specifications Institute (a technical society whose core purpose is to improve the process of creating and sustaining the built environment) and the R.S. Means Company (a supplier of construction cost information). The factors were verified using

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data from closed-out grants for large projects nationwide and as more cost data becomes available the factors could be revised to more appropriately reflect market conditions. The CEF worksheet (in Microsoft Excel format) is used to apply the factors in Parts B through H, to the Part A estimate.

Typically, an applicant (the owner or party responsible for repairs) utilizes a general contractor and a number of subcontractors to complete a large construction project in a competitively bid environment. The structure of the CEF mirrors the applicant-general contractor-subcontractor relationship for eligible work in that:

- Part A costs are representative of the construction efforts of the subcontractor(s).
- Parts B, C, D, and E represent the general contractor or equivalent construction-related costs; they can be considered as “as-bid” costs and represent the costs of completing the work in a competitively bid environment.
- Parts F, G, and H represent the applicant’s markups and construction-related costs once the design and construction contractor(s) have been hired.

### **Eligible Work and Cost**

Grants administered under the PA Program must comply with the provisions of the Stafford Act. Application of these provisions is described in Part 206 of Title 44 of the Code of Federal Regulations (CFR). These regulations define the types of facilities, work, and costs that are eligible for reimbursement under the PA Program. When a large project estimate is developed, the base cost (Part A) must include only that work which is eligible under these regulations.

Public Assistance grants must also comply with Part 13 of 44 CFR, which defines procedures for grant administration by the State and provides specific guidance on allowable costs. The factors included in the CEF represent only those non-construction costs that are allowable under Part 13. The factors also represent costs that an applicant can reasonably expect to incur during construction, if not already itemized and included in Part A. Excessive mark-ups for *possible* contingencies are not allowable under the provisions of Part 13.

### **Applicability and Limitations**

In general, to qualify for CEF consideration, a project must be:

- a large project (according to the FEMA threshold for the applicable fiscal year); and
- permanent restorative work (Categories C – G).

The CEF is intended for use on large permanent work projects that are eligible under the Stafford Act, Federal regulations, and FEMA policy. It may be used for all types of disasters and all types of facilities, including:

- Transportation facilities, including roadways, bridges, and tunnels.
- Water control facilities, such as irrigation and drainage systems.
- Buildings and similar structures, including warehouses, garages, offices, schools, libraries, municipal buildings, museums, research facilities, laboratories, and hospitals.
- Utilities, such as water treatment, wastewater treatment, and power generation facilities, including the associated transmission, distribution, and collection systems.
- Special facilities such as railroads, ports, marinas, and airports.

The Panel agrees with FEMA's application or non-application of the CEF given different circumstances on projects as follows:

- The CEF should not be used for small projects, or for emergency work, such as large-scale debris removal operations (whether a small or a large project).
- The CEF should only be used on large projects for which the permanent restorative work (Categories C, D, E, F, and G) is equal to or less than 89% complete.
- Large projects that are equal to or greater than 90% complete are not required to use CEF, but will use actual costs within the Project Worksheet instead.

*Note that percent complete is derived from the approved design and/or construction timeline for eligible work, using the start and completion dates of the project to determine project duration.*

The CEF Workbook has been organized to make it user-friendly and flexible enough to respond to individual project conditions and to promote uniformity in the development of cost estimates. While many projects are simple to analyze, others will need to be analyzed by level of completion and type of work activity being conducted. Therefore, the user can structure the workbook to address specific project characteristics by simply clicking on those parameters that define the project.

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### Parts of the CEF Workbook

The parts of the CEF workbook are separated onto individual worksheets at the bottom of the workbook. They are:

- CEF Fact Sheet
- Part A – “Base Costs” for Construction Work In Trades
- Summary for Completed Work
- Summary for Uncompleted Work
- Total Project Summary
- CEF Notes

Each of these parts is described below.

#### *CEF Fact Sheet*

The CEF Fact Sheet is the foremost worksheet in the CEF workbook and must be completed first. It is designed to allow the user to document basic information about the project and the estimate, including the date the CEF was prepared, the declaration number, the FEMA Region, the applicant, the category of work, and the name and location of the facility. The user should also provide a clear and concise description of the eligible scope of work.

The fact sheet also allows the user to customize the workbook for the type of work being performed and the level of project completion. This customization occurs automatically when the user answers questions on the fact sheet, and includes changes to the formatting and labeling.

Type of Work: The fact sheet asks the user for the type(s) of work that must be performed and types of work can include:

- Repair work: activities that are solely allocated to restore a damaged facility to its pre-disaster condition.
- Retrofit and upgrade: activities undertaken to upgrade a damaged item to current codes and standards.
- New construction: the replacement of part or all of a facility, as opposed to repairing or retrofitting discrete elements.

- Hazard mitigation: measures taken to reduce or eliminate future damage from hazards similar to that which caused the damage, or from multiple hazards.
- Other work: activities that are typically undertaken outside of the typical applicant-general contractor-subcontractor relationship. Examples include hazardous material abatement, selective demolition, and force account activities.

A project can consist of one type of work, or multiple types, depending upon how the restoration activities match the requirements of the Public Assistance Program. The user should select the work type(s) to be analyzed and enter them into the fact sheet. Once the fact sheet is completed, a CEF Workbook tailored specifically for this analysis will be created. To change the prepared format, the user should go back to the fact sheet and redefine the parameters of the project.

### *Part A – Base Costs for Construction Work In Trades*

Part A of the CEF Workbook is designed to capture the detailed construction cost (or base cost) associated with each work activity that makes up the eligible scope of work. Estimates are defined using the Cost Item Number, Item Description Title or Component Description, and Cost Codes columns. The total estimated cost for each work activity is a product of the quantity, unit price, and city adjustment index by Construction Specifications Institute (CSI) Division.

Work Completion: Projects being analyzed will likely have completed and uncompleted work elements. Since several of the CEF factors are based upon unknowns that result from the level of completion, the workbook is structured to analyze completed and uncompleted work separately. Therefore, it is recommended that the user separate completed and uncompleted work in Part A.

Mixing actual costs with estimated costs in mid-construction can lead to inaccurate estimates, unless the already completed work is a discrete, stand-alone portion of the project without the potential for change orders. For example, cost inaccuracies can result by using unit costs applicable to interstate highway construction for rural road projects, or by using concrete unit costs applicable to batch plant operations in situations where truck supplied concrete is the preferred method of operation. Therefore, to be considered “completed work,” a project work element must be:

- a specific type of work (repair, retrofit, new construction, hazard mitigation, or other) for which actual incurred costs documentation for eligible work can be easily obtained; and

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- a discrete work activity (such as grading or laying foundations) that is complete and has no potential for future change orders.

In some cases, an applicant may have solicited bids for the project before the CEF is prepared. The lowest qualified bid amount obtained through a competitive bid process can be accepted for purposes of developing an estimate, as long as the bid conforms substantially to the eligible scope of work and the qualified bidder has been given the notice to proceed.

### *Summary for Completed Work*

Using the Summary for Completed Work, the user selects factors that are applied to the base cost estimate (Part A) for completed work. The user employs either check boxes or specific values to apply each factor or sub-factor in the worksheet. Check boxes are used when the factor is fixed (such as with B.2, the factor for General Conditions) or is calculated by the worksheet automatically (such as with H.1, the factor for Applicant's Project Management – Design Phase).

### *Summary for Uncompleted Work*

Similarly, the Summary for Uncompleted Work allows the user to select factors that are applied to the base cost estimate (Part A) of uncompleted work. As with the Summary for Completed Work, factors in Parts B through H are applied using check boxes or by selecting specific values.

Guidance on selecting factors (Parts B through H) is appropriately discussed throughout the text of the Cost Estimating Format (CEF) for Large Project – Instructional Guide, Version 2 (November 1998).

### *Total Project Summary*

The Total Project Summary merges estimated costs for completed and uncompleted work into a single estimate for the entire project. This estimate is used in the preparation of the Project Worksheet (PW).

### *CEF Notes*

The CEF Notes sheet provides the user with a place to document the logic, assumptions, and reasoning for the selection of each factor. To ensure proper documentation, the user must enter notes for each work type and must indicate the values chosen for each factor. The sheet also contains an area for miscellaneous comments and notes.

## 5.7 Panel Members' Biographies

### **Albert R. Ashwood (National Emergency Management Association)**

Oklahoma Department of Civil Emergency Management  
2401 N. Lincoln Blvd, Suite C51  
P.O. Box 53365  
Oklahoma City, OK 73152-3365  
Phone: (405) 521-2481

Governor Frank Keating appointed Albert R. Ashwood Director of the Oklahoma Department of Civil Emergency Management in August 1997. Prior to his appointment, he served the department as Deputy Director, from June 1995 through August 1997.

Mr. Ashwood has held the position of State Coordinating Officer for seven Presidential Disaster Declarations, including the terrorist bombing of the Alfred P. Murrah Federal Building on April 19, 1995. Following the bombing, he was first on the scene for the department, arriving approximately 25 minutes after the explosion. He headed forward operations for the first three days of the incident before turning his attention to the administration of recovery efforts.

Mr. Ashwood has overseen the distribution and administration of over \$250 million in federal and state aid following Presidential Declarations, while serving the department. He joined the state in 1988, and has served the department in various positions during his tenure.

In response to the September 11 terrorist acts upon our nation, President Bush created the new White House Office of Homeland Security. Mr. Ashwood has been appointed Oklahoma's Point of Contact for the Office of Homeland Security. Governor Keating also named Mr. Ashwood as vice chair to the Governor's Security and Preparedness Executive Panel.

Prior to State employment, Mr. Ashwood worked three years as editor of the Lincoln County News, a local Oklahoma newspaper.

Albert makes his home in Chandler, Oklahoma, with his wife and two children.

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### **Robert L. Edelblut, Sr. (National Society of Professional Engineers)**

908 Victoria Landing Drive  
Woodstock, GA 30189-5479  
Phone: (770) 928-9531

Robert L. Edelblut, Sr., P.E. is a native of Fort Myers, Florida and resides in Woodstock, Georgia with his wife of 59 years, Jewel.

Since 1945, Mr. Edelblut has been completely engaged in the cost estimation of construction projects, the management of construction projects, and other responsible actions required for the successful completion of any type of infrastructure work.

Mr. Edelblut is a registered licensed Professional Engineer in the States of Georgia and Alabama. He also holds professional licensure in the areas of Utility Management and Real Estate Sales in the State of Georgia.

Mr. Edelblut has practiced for the past 40 years in the civil, structural and mechanical fields of the engineering and construction disciplines. Mr. Edelblut laid his first water main in 1938 and since that time has been in responsible charge of important engineering work in the capacity of Project Manager or Construction Superintendent for numerous infrastructure projects, which include: a lock and dam project on a river in Tennessee; numerous water treatment and wastewater treatment plants for public entities; sewerage collection systems, including storm water detention and collection facilities; various types of manufacturing plants; high-rise, mid-rise and standard commercial buildings, including buildings for colleges, college student centers and county school systems; public office facilities; residential housing complexes; United States Army Corps of Engineers projects (with and without TRACE requirements); numerous state roads and highways, and city streets; numerous site development projects; and construction innovations on some of the country's first infrastructure projects based entirely on metric dimensioning.

Mr. Edelblut has been actively engaged with several professional associations and has held many offices in this regard. He is a member of the National Society of Professional Engineers (NSPE) and held the posts of National Chairman, Vice-President, Southeastern Vice-Chairman, and State Governor, respectively, of the Professional Engineers in Construction Practice Division and is also a member of the NSPE's Private Practice Division. Mr. Edelblut also served the society in the capacity of participating member of the Engineer's Joint Contract Document Committee. He is a member of the Georgia Society of Professional Engineers and

a past Northwest Chapter President, Regional Vice-President and State President of the society. Mr. Edelblut has been actively involved in other professional pursuits, to include membership in the American Arbitration Association (Construction Arbitrator), the American Planning Association (both at the State Chapter and National levels), the American Society of Professional Estimators (an affiliate member of the Georgia chapter and National Society), the Construction Specifications Institute, and the Cherokee County Board of Equalization (a Grand Jury appointment to serve) and the Cherokee County-Municipal Planning and Zoning Commission (a Board of Commissioners appointment to serve on a county-wide basis).

Mr. Edelblut was part owner of a construction company specializing in public utility projects based in the State of Florida. He has been a senior estimator for Davis Constructors and Engineers (a subsidiary of Daniel International) in Albany, Georgia. Mr. Edelblut also was a joint venturer with CFW Construction Company of Tennessee on public works projects. He served as the project representative for the Gwinnett County Water and Sewer Authority and was in responsible charge of extensive public works. In this capacity, Mr. Edelblut worked for the former Commissioner of the Georgia Department of Transportation, Mr. Wayne Shackelford. Mr. Edelblut was the Project Manager, Chief Estimator and Secretary-Treasurer of Barge-Wagener, Incorporated. This firm was the successor of Barge and Company. Mr. Edelblut has also consulted in the areas of cost estimation and project management for numerous contractors.

### **Claudette R. Ford (American Public Works Association)**

Public Works Agency  
City of Oakland  
250 Frank Ogawa Plaza  
Oakland, CA 94612  
Phone: (510) 238-6256

Claudette R. Ford has served as the Director of the Oakland, California, Public Works Agency since May 2000. Prior to assuming this position, Ms. Ford held the position of Assistant Director of Maintenance Services and Interim Agency Director from October 1998 until May 2000. Ms Ford started her career in Public Works in Hartford Connecticut, where she served as the Recycling Coordinator and implemented curbside recycling in 1991. She later was promoted to Environmental Services Manager for the City of Hartford. This unit included refuse and recycling collection, property maintenance and other environmentally sensitive issues. In 1994, Ms. Ford became the Director of Public Works in New

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Haven, Connecticut. She served in that position until she accepted the position with the City of Oakland.

Ms. Ford holds a Bachelors of Arts degree from Marymount College, Tarrytown, New York and a Masters of Business Administration from Marymount University, Arlington, Virginia. She has also completed additional course work at the Hartford Graduate Center/Rensselaer Polytechnic Institute, Yale University Management Training Institute and most recently is a graduate of the 2002, National Forum of Black Public Administrators Executive Leadership Institute.

Ms. Ford believes strongly that Public Works is a key and critical component to the successful delivery of emergency services.

### **R.A. Kai ‘opua Fyfe (American Society of Professional Estimators)**

P.O. Box 3870  
Lihue, HI 96766  
Phone: (808) 246-8899

Kai ‘opua Fyfe brings to the Panel, 30 plus years of experience in commercial, industrial and institutional construction management, design coordination, cost engineering, project management, and claims mitigation and administration. He is a Certified Professional Estimator in General Construction and Finish Trades disciplines.

Mr. Fyfe’s disaster-specific expertise spans 13 years and 16 Presidential declarations. From July 2001 to April 2002, he was assigned to the FEMA Texas Medical Center Task Force as a Technical Assistance Contract Project Officer and Senior Cost Estimator utilizing the Construction Estimating Format for Large Projects.

His previous disaster work includes multiple hurricanes in the U.S Virgin Islands, Puerto Rico, the Florida Keys and Hawai’i; numerous floods in Texas, the Dakotas, West Virginia, and Georgia; the Loma Prieta Earthquake in San Francisco, and Typhoon Omar on Guam.

Post-Hurricane Marilyn, Mr. Fyfe provided consulting estimating services to the University of the Virgin Islands. He developed cost estimates for repair and replacement; hazard mitigation; improved and alternate project scenarios for infrastructure, mixed-type building and marine facility projects at three island campuses.

Mr. Fyfe is a past National Officer of the American Society of Professional Estimators with heavy committee involvement in Education, Certification, Standards and Industry Awareness. He has served as a Construction Panel Arbitrator for the American Arbitration Association.

In his Hawai`i community, Mr. Fyfe is a Charter Board Member, past officer and Island Council Representative to the Native Hawaiian Education Council, appointed by the Secretary, U.S. Department of Education. At the Hawai`i State Legislature he was in-session Clerk of the Senate Committee on Hawaiian Affairs. He is student, trainer and facilitator of strategic planning and collaborative leadership for Native Hawaiian Community Development organizations. Mr. Fyfe fulfills multiple roles to his extended-family organization relating to historical relationship with significant sites, genealogy and oral histories, and perpetuation of cultural traditions and indigenous language.

### **Charles F. Harper (American Institute of Architects)**

Harper Perkins Architects  
4724 Old Jacksboro Highway  
Wichita Falls, TX 76302  
Phone: (940) 767-1421

Charles Harper, FAIA is a native of Bonham, Texas. In 1950 he started his architectural career at Texas Tech, graduating in 1955. He is Chief Executive Officer of his architectural firm, Harper Perkins Architects (HPA) in Wichita Falls, Texas. HPA will celebrate 40 successful years in 2002, one of the oldest firms in North Texas. Harper is a Registered Architect in the States of Texas, Oklahoma, Arizona, New Mexico, Colorado, Arkansas, Alabama, North Carolina and Florida.

He is a member of the American Institute of Architects (AIA), the Construction Specifications Institute (CSI) and the Interfaith Forum for Religion, Art and Architecture (IFRAA). In 1986 he was honored by the AIA by being named "Fellow, American Institute of Architects" (FAIA). Mr. Harper is a member of the AIA Regional Urban Design Committee, Chair of the National AIA Disaster Response Committee and a member of the Regional/Urban Design Assistance Team (R/UDAT) Task Group. In Texas, Mr. Harper has served as Vice President of the Texas Society of Architects (TSA) and has been a member of the Board of Directors of TSA. In 1970 he designed the Texas Architect's Disaster Response and two years later applied that idea to the National AIA's Disaster Response Committee, which he chairs. His work in disaster recovery across the nation has earned him several awards, including the 2001 Kemper Award by the National

## 5.0 Appendices

AIA. Mr. Harper has been awarded “Distinguished Alumnus of Texas Tech” for 1997 and “Distinguished Alumnus, College of Architecture” for 1997.

Mr. Harper has served the City of Wichita Falls, Texas in the capacity of Mayor and as a member of the National Conference of Mayors, the National League of Cities; and the Board of Directors, Texas Municipal League.

Mr. Harper serves his Church, the United Methodist Church, and his University, Texas Tech, on many Boards and committees. In addition to those honors listed above, he has been the recipient of many others from his Church, his City, his University and his Profession.

His wife, Betsy; his sons and daughters-in-law, Martin and Sara, and Mark and Teresa, along with five grandchildren, are his greatest joy.

### **G. Michael Hoover (Associated General Contractors of America)**

Sundt Construction, Incorporation  
P.O. Box 20687  
Phoenix, AZ 85046  
Phone: (602) 261-6700

G. Michael Hoover serves as Vice President and Estimating Manager for the Heavy Civil Division of Sundt Construction, Incorporated and is responsible for staffing and managing the estimating department, including the training and development of department personnel. He is responsible for reviewing project estimate packages to ensure their accuracy and completeness.

Mr. Hoover began his career in the construction industry with the Sundt group of companies in 1978 serving on mechanical and civil projects. He has served as Chief Estimator, Senior Project Manager, Project Manager, Project Superintendent, and Project Engineer on airport, highway and bridge projects, as well as industrial and municipal treatment plant facility construction work individually valued from \$1 to over \$150 million.

Mr. Hoover is a graduate of the University of Arizona with a Bachelor of Science degree in Mechanical Engineering. He has also attained the practice level of Journeyman Carpenter and is a member of Union Local 2 since 1988.

Mr. Hoover is professionally affiliated with the Associated General Contractors of America and has served on the Board of Directors for the Arizona Chapter. He is also a Transportation Committee Member and an active participant of the Sundt Management Program since 1999 to present.

Mr. Hoover believes strongly that Leadership Excellence Accelerates Performance.

**Jon A. Oshel (National Association of County Engineers)**

Association of Oregon Counties  
P.O. Box 12729  
Salem, OR 97309-0729  
Phone: (503) 585-8351

*Experience:*

- 2000 to present County Road Program Manager, Association of Oregon Counties
- 1982 to 2000 Public Works Director, Tillamook County
- 1978 to 1982 Consultant Engineer, Road Design/Construction
- 1975 to 1978 County Engineer, Deschutes County
- 1969 to 1975 Civil Engineer, Washington State Highway Department

During Jon’s tenure as Tillamook County Director of Public Works he supervised over 70 major slide repairs on Tillamook County Roads. He also managed the storm response and recovery of roadways during seven emergency and major disaster declaration events.

*Award:*

Oregon Counties Engineer of the Year 1987, 1991 & 1994

*Education:*

San Diego State University – Bachelor of Science, 1969  
Registered Professional Engineer – State of Oregon

*Professional Affiliations:*

- 1982 to present Oregon Association of County Engineers and Surveyors (OACES)
- 1985 to present OACES Representative for Federal Forest Highway Program

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1999 to 2000	OACES Liaison to AOC Board and Legislative Committee
1985 to present	American Public Works Association
1985 to present	National Association of County Engineers
2001	Federal Advisory Committee 10733 Expert Panel on Cost Estimating for the Public Assistance Program Federal Emergency Management Agency
1995 to 2000	NACO Transportation Steering Committee
2000 to present	Oregon Partnership for Highway Quality Committee ODOT Local Officials Advisory Committee
1997 to 2000	ODOT Highway Plan—Classification Committee
1999	ODOT Land Use and Environmental Laws Committee
1996	ODOT Strategic Planning Process (Re-Engineering)
1996	Staff, Governor’s Transportation Initiative
1993	Member, Oregon Roads Finance Study (Forward Oregon)
1991	Member, Update of 1986 Oregon Roads Finance Study Member, Oregon Roads Finance Study (Making the Right Turn)
2002 to present	“Roads Scholar” Instructor

### **Norman H. Roush (American Association of State and Highway Transportation Officials)**

West Virginia Department of Transportation  
1900 Kanawha Boulevard East  
Building 5  
Charleston, WV 25305-0440  
Phone: (304) 558-2804

Norman Roush is a native of Letart Falls, Ohio and has been a resident of West Virginia for 35 years.

He is a graduate of Ohio University with a Bachelor of Science degree in Civil Engineering. Mr. Roush is licensed in the States of West Virginia and Ohio

as a Registered Professional Engineer and a Registered Professional Land Surveyor.

The West Virginia Division of Highways has employed Mr. Roush for 36 years. In February 1998, he was appointed Deputy Commissioner and was appointed later to serve as Deputy Secretary of the West Virginia Department of Transportation as well. He is, among other duties, responsible for coordinating development and liaison activities with City, County, State, and Federal agencies.

Previously, he was the Chief Engineer-Development, which carried the responsibility for all projects through their design and right-of-way stages, including management supervision of Roadway Design, Structures, Traffic Engineering, and Right of Way Divisions.

Mr. Roush has attended and spoken at several American Association of State and Highway Transportation Officials (AASHTO) committee meetings and has been a speaker for the Division on many occasions. Mr. Roush serves on the AASHTO Task Force on Preconstruction Engineering Management and also serves on the Task Force on Geometric Design, which is developing the new "Green Book." Mr. Roush also serves on the Transportation Research Board Committee for Geometric Design and for Operational Effects of Geometrics. He has served on various National Council of Highways Research Program (NCHRP) panels and is currently chairman of NCHRP Panel 20-7, Roadway Widths on Very Low Volume Roads.

A member of the AASHTO Design Committee for 20 years, Mr. Roush was the recipient of the Region II Design Award in 1986 and 1998 and the National Award of the Subcommittee on Design in 1989.

Mr. Roush is active with the Association for Retarded Citizens and is active in his United Methodist Church and community. He has been married 43 years to his wife Janet and is the father of three children and the grandfather of six.

### **Laurence W. Zensinger (Federal Emergency Management Agency)**

Federal Center Plaza  
500 "C" Street, S.W., Room 326  
Washington, D.C. 20472  
Phone: (202) 646-3685

Laurence W. Zensinger serves as the Director of the Recovery Division in FEMA's Readiness, Response and Recovery Directorate. The Recovery Division is responsible for policy development and oversight of the implementation of

## 5.0 Appendices

FEMA's Individual Assistance and Public Assistance Programs. Mr. Zensinger also serves as Chair of the National Emergency Food and Shelter Board, a program which distributes more than \$140 million annually to battle homelessness, and is the executive in charge of the Cerro Grande Fire Recovery program which is compensating victims of the Los Alamos fires that occurred in May 2000. In addition, the Division is responsible for disaster victim registration and application processing. As such, the Division manages three National Processing Services Centers located in Denton, Texas Hyattsville, Maryland and Mount Weather, Virginia. These centers process an average of 300,000 disaster claims and 2 million phone calls per year.

Mr. Zensinger's career with FEMA began in 1978 with the Federal Insurance Administration (FIA), then part of the Department of Housing and Urban Development. As a flood insurance specialist with FIA, Mr. Zensinger was instrumental in the development and implementation of the first flooded property purchase and relocation program, under Section 1362 of the National Flood Insurance Act of 1968. During his career at FEMA, Mr. Zensinger has held a number of positions in organizations responsible for implementing disaster relief programs, including Chief of the Hazard Mitigation Branch and Director of the Public Assistance and Program Coordination Divisions of the State and Local Programs Directorate, predecessor to the Response and Recovery Directorate.

Mr. Zensinger has also undertaken a variety of special assignments, including the coordination of the Midwest Flood Buyout program in 1993 and 1994, which resulted in the acquisition and removal from the floodplain of over 8,000 flood damaged structures. In addition, he served as the Federal Coordinating Officer for DR-1008, the Northridge Earthquake during a critical period in 1995, which resulted in a complete restructuring and redirection of the office to assume its long term recovery mission.

Mr. Zensinger is a graduate of Valparaiso University in Valparaiso, Indiana with a Bachelor of Arts degree in Earth Sciences and of Southern Illinois University, with a Masters in City Planning. He resides in Alexandria, Virginia with his wife, Margaret.





**Federal Advisory  
Committee 10733**

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**Recommendation Report of the  
Expert Panel on  
Cost Estimating for the  
Public Assistance Program**

**October 2002**