

Association of State Floodplain Managers

Certified Floodplain Manager® System:

Accreditation Audit Project Final Report

Center on Education and Training for Employment and SeaCrest Company

FINAL REPORT (5-7-2010)



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PROJECT DELIVERABLES

1. This report of the accreditation audit project
2. Project database in MS Access format (tables for Examination Topics, DACUM Knowledge Areas, questions with tagged information averaged across subject matter experts, Subject Matter Experts; queries and reports) – to be delivered
3. Materials shared during project performance
 - a. DACUM Practice Analysis online Verification survey and data (transferred to ASFPM account)
 - b. Item Writing Guidelines from November workshop (shared in MS Publisher format in October)

OVERVIEW

This document summarizes an audit of the Certified Floodplain Manager® system based on accreditation standards. The project was conducted for the Association of State Floodplain Managers (www.floods.org) which operates this voluntary certification program. The team of contractors included the Center on Education and Training for Employment (www.cete.org) of The Ohio State University and the SeaCrest Companies (www.seacrestcompany.com). Both organizations are members of the Institute for Credentialing Excellence. Guidance throughout this audit project was accreditation standards of the National Commission on Certifying Agencies (Institute for Credentialing Excellence, 2004; www.credentialingexcellence.org/). Twenty-one standards with essential elements guide certifying bodies who wish to compare their programs to quality standards. The sections of this report are titled as follows (1) Background of Reliability and Validity (R&V) Audit Project; (2) SeaCrest report on Standards 1-9 and 19-20 (prepared by Janice Moore and incorporated in this overall report); (3) CETE report on Standards 10-18 for Assessment Instruments, (4) Overall conclusions and strategic considerations for ASFPM, and (5) Attachments D-M. Standard 21, which pertains to maintaining accreditation, was not addressed because ASFPM has not achieved accreditation. It becomes relevant when ASFPM gains accreditation.

SECTION 1) BACKGROUND OF RELIABILITY-VALIDITY AUDIT PROJECT

The background of this project involved a decision to undertake a Governance-Reliability-Validity Audit of the CFM® credential program. Audits are useful for continuous improvement and possible future accreditation by (NCCA or ANSI). Related quality control mechanisms for testing are discussed by Wild and Ramaswamy (2007) and free materials are provided by NCCA at the Institute for Credentialing Excellence website (www.credentialingexcellence.org). A contract with The Ohio State University Research Foundation was finalized on April 10, 2009 to specify the terms and the project deliverables (this combined report and a database containing the question bank). The CFM® program was developed by ASFPM starting in 1993. The program has certified nearly 7,000 individuals since 1999. Details of the program may be found at the ASFPM website (www.floods.org). Project staff members created a background document on the CFM® program after a review of materials and structured interviews with stakeholders within ASFPM (George Riedel, Kait Laufenberg, Anita Larson, and John Ivey). The materials reviewed included website sections labeled Program Information, Application, History of the Program, and Floodplain Management Body of Knowledge. This background document was shared prior to the DACUM occupational practice analysis.

The next section provides the needs assessment prepared by SeaCrest principal Janice Moore. It is organized in terms of documents reviewed, compliance with NCCA Accreditation Standards 1-9 and 19-20, and a more detailed analysis. The attachments are provided directly after each report for ease of access. The third section provides a CETE report organized around NCCA Accreditation Standards 10-18. The section follows a similar layout of a compliance table followed by a detailed analysis of the standards. In both reports the logic was to compare available documents or project activities and results to the accreditation standards, which are organized in three parts as a 1) standard, 2) essential element(s), and 3) commentary. The fourth and final section provides overall recommendations and some strategic directions for ASFPM consideration.

The project team wishes to emphasize that no individual can represent the determination of the full NCCA Commission when they review a complete accreditation application package (a sample accreditation application is provided at the Institute for Credentialing Excellence website). Implementation of the recommendations in this report, which are advisory to ASFPM, is not a guarantee that accreditation will be granted.

SECTION 2) SEACREST REPORT (INCORPORATED IN ITS ENTIRETY)

Accreditation Needs Assessment Association of State Floodplain Managers (ASFPM) Certified Floodplain Manager (CFM)

Prepared by Janice Moore, SeaCrest Company
May 28, 2009

Introduction

After a thorough review of the Association of State Floodplain Managers' (ASFPM) Certified Floodplain Manager (CFM) program the following Needs Assessment report has been developed. The materials reviewed included policies and procedures, candidate materials, governance documents, and the ASFPM web site (see [Attachment A](#) for a complete list).

The goal of this report is to detail areas of significant concern regarding a planned application for National Commission for Certifying Agencies (NCCA) accreditation and compliance with the NCCA *Standards for the Accreditation of Certification Programs* (NCCA Standards). For the purposes of this report the review focused on the accreditation standards related to the administrative aspects of the program (NCCA Standards 1-9 and 19-20). The standards pertaining to assessment instruments (standards 10-18) are being addressed separately by the Ohio State University Center for Education and Training for Employment (CETE).

It is important to note that there are currently two pathways to earning a CFM designation: (1) certification awarded by ASFPM directly to individuals who pass the national CFM exam and (2) certification awarded by a state, ASFPM chapter, state agency or regional association that has been accredited by the Certification Board of Regents (CBOR). To increase the ASFPM CFM program's chances of achieving NCCA accreditation, it is our recommendation that the accreditation application should be submitted for the national CFM program only. It is likely that the NCCA will consider the six state programs as six separate designations. The state CFM programs may wish to submit separate NCCA applications, but they should only do so if they can document full compliance with all of the NCCA Standards, including the exam-related standards. This issue is discussed in more detail in the [Assessment Instrument](#) section of this report.

Please note that a psychometrician was not involved in the preparation of this report. It is noted that CETE is providing psychometric review of the CFM exam as part of a larger project, of which this report is one portion.

Compliance Summary

NCCA Standards

Key:

Met:	Standard is met and documentation is sufficient to demonstrate compliance
Partial:	Standard may be met in practice, but documentation is not sufficient to demonstrate full compliance
Not Met:	Standard is not met and changes should be implemented to achieve compliance

Standard	Compliance	Recommendations
1	Met	
2	Not Met	Amend the Charter to give CBOR the autonomy to make decisions regarding essential certification activities including: eligibility standards; development, administration, and scoring of the exam; selection of key certification personnel; and operational processes for the CFM program. Re-structure the CBOR so that the ASFPM Board does not appoint a majority of

Standard	Compliance	Recommendations
		CBOR members.
3	Not Met	Amend Charter to include requirement for CFM representation on the CBOR. Add at least one public member to the CBOR.
4	Met	
5	Met	
6	Partial	Expand appeals to include exam results. Include appeals process on web site. Create confidentiality policy and include on web site. Update certification statistics on web site. Create a policy for compliance with the Americans with Disabilities Act and publish information on the web site regarding requests for special testing accommodations. Add a nondiscrimination statement to the web site. Create a quality assurance policy.
7	Partial	Publish information on exam scoring and results. Publish description of the exam development and validation process.
8	Met	
9	Met	
10-18	Not Met	See recommendations below and CETE report.
19	Partial	Publish the rationale for the renewal time interval.
20	Not Met	Publish information that demonstrates the continuing education requirement supports CFM professional development.

Purpose, Governance and Resources

NCCA Standard 1

This standard is met.

The purpose of the CFM program is documented in the *Charter for the Certified Floodplain Manager Program*, the *Certified Floodplain Manager Program* brochure, and other program materials.

NCCA Standard 2

This standard is not met.

Standard 2 requires the structure and governance of the program to ensure autonomy in decision making over all essential certification activities.

The *Charter for the Certified Floodplain Manager Program*, Section VIII.A. (page 13) states that the ASFPM Board of Directors will “establish policies, procedures, budgets, and other administrative tools for operation of the ASFPM CFM

program.” To provide for the autonomy in decision making required by Standard 2 the Certification Board of Regents (CBOR), as the body designated to govern the certification program, should have the authority to establish policies for the CFM program. Standard 2 requires that the CBOR have the authority to make decisions regarding essential aspects of the certification program, including: establishing eligibility standards; developing, administering, and scoring the exam; selecting key personnel; and overseeing the program’s operation. To comply with this standard the Charter should be amended to grant the CBOR authority to establish all key certification policies and procedures.

In addition, the structure of the certification program must protect against undue influence that could compromise the integrity of the certification process. The *Charter for the Certified Floodplain Manager Program* (page 13) states that the CBOR is appointed by the ASFP Board. This process will likely be viewed by the NCCA as a violation of Standard 2. To comply with the Standard, a majority of the CBOR members should not be appointed by any one parent Board or other organization. Currently, the CBOR is composed of 12 members as shown in Table 1 below. Eight of the 12 CBOR members are appointed by the ASFP Board. In order to comply with Standard 2 the selection process for CBOR members should be changed.

There are many acceptable methods for selecting members of a certification board. A few examples are listed below. Some of these methods can be used alone or in combination.

- **Nominating Committee:** A Nominating Committee could be charged with soliciting nominations for CBOR positions, screening candidates, and establishing a ballot. The ballot would be sent to the membership and/or certificants for a vote, OR would be sent to the CBOR to appoint members. Members of the Nominating Committee could be (1) elected by ASFP members and/or CFMs, appointed by the CBOR, or a combination of both. It would also be acceptable for the ASFP Board to appoint one member of the Nominating Committee.
- **Elected Members:** A majority of CBOR members could be elected by Certified Floodplain Managers (CFM) and/or ASFP members.
- **Self-Appointed Members:** A majority of CBOR members could be selected and appointed by the CBOR.

Table 1: Current CBOR Composition

CBOR Members	Appointed By	Voting/Non-Voting
1. ASFP Chapter Representative	ASFP Board	Voting
2. Local Government Representative	ASFP Board	Voting
3. State Government Representative	ASFP Board	Voting
4. Private Sector Representative	ASFP Board	Voting
5. Academic Representative	ASFP Board	Voting
6. FEMA Federal Insurance and Mitigation Administration Representative	FEMA	Voting
7. FEMA EMI Representative	FEMA EMI	Voting
8. Federal Interagency Floodplain Management Task Force Representative	Task Force	Voting
9. ASFP Professional Development Committee Member	ASFP Board	Voting
10. ASFP Training Committee Member	ASFP Board	Voting
11. ASFP Executive Director	Ex-officio position	Voting
12. ASFP At-large Member	ASFP Board	Voting

Regardless of the method chosen for the selection of CBOR methods, the outcome should ensure that the members are selected without any real or perceived undue influence from the ASFPM Board (or any other outside group). Under the new structure, the ASFPM Board may retain the authority to appoint a small number of CBOR members; however any individuals appointed by the ASFPM Board should not also be current ASFPM Board members.

One possible method for re-structuring the CBOR is illustrated in Table 2.

Table 2: Sample CBOR Composition

CBOR Members	Selected By	Voting/Non-Voting
1. ASFPM Chapter Representative	Appointed by CBOR	Voting
2. Local Government Representative	Appointed by CBOR	Voting
3. State Government Representative	Appointed by CBOR	Voting
4. Private Sector Representative	Elected by ASFPM Members/CFMs	Voting
5. Academic Representative	Elected by ASFPM Members/CFMs	Voting
6. Public/Consumer Member (See Standard 3)	Appointed by CBOR	Voting
7. FEMA Federal Insurance and Mitigation Administration Representative	Appointed by FEMA	Voting
8. FEMA EMI Representative	Appointed by FEMA	Voting
9. Federal Interagency Floodplain Management Task Force Representative	Appointed by Task Force	Voting
10. ASFPM Professional Development Committee Member	Appointed by ASFPM Board	Voting
11. ASFPM Training Committee Member	Appointed by ASFPM Board	Voting
12. ASFPM Executive Director	Ex-officio position	Non-Voting
13. ASFPM At-large Member	Elected by ASFPM members/CFMs	Voting

Standard 2 also prohibits the certification board from being responsible for accrediting or providing training programs or courses of study that lead to the certification. It appears that the only involvement CBOR has in training is to assist in the preparation and review of study materials for exam candidates. These materials are made available to all candidates at no additional fee and do not appear to be in violation of this portion of the standard.

NCCA Standard 3

This standard is not met.

Standard 3 requires that the CBOR include representation from (1) individuals who hold the CFM designation and (2) a public member ([see Terminology, Attachment B](#)).

The list of current CBOR members demonstrates that individuals who hold the CFM designation are represented on the CBOR. However, the requirement that the CBOR composition include individuals with the CFM should be formalized and included in the *Charter for the Certified Floodplain Manager Program*. The amended charter should be specific regarding a minimum number of CBOR members who must hold the CFM designation.

A public member (see [Attachment C](#) for complete criteria) should be added to the CBOR and the *Charter for the Certified Floodplain Manager Program* should be amended to include a requirement for at least one public member position on the CBOR.

NCCA Standard 4

This standard is met.

The CFM program appears to have sufficient financial resources to conduct effective and ongoing certification and renewal activities.

NCCA Standard 5

This standard is met.

The CFM program appears to have sufficient staff and non-staff consultants to conduct effective and ongoing certification and renewal activities.

Responsibilities to Stakeholders

NCCA Standard 6

This standard is not met.

Standard 6 requires that the CFM program establish, publish, apply and periodically review key certification policies and procedures. For a policy to be [published](#) it must be easily accessible by candidates for the certification (see [Attachment B, Terminology](#)). The policies required by Standard 6 are listed below in Table 3.

Table 3: Policies and Procedures

Policy	Availability
Purpose	CFM Program Brochure
Eligibility	Application Package
Application Process	Application Package
Exam Administration	Web Site
Content Outline	Web Site
Appeals	Eligibility: Charter Exam Results: Not appealable Certification Status: Charter
Discipline	Web site
Confidentiality	Partial information in Application Package
Certification Statistics	Outdated information on web site
ADA Accommodations	Not published
Nondiscrimination	Not published

Standard 6.C requires that candidates and certificants have the ability to appeal eligibility determination, exam results, and certification status.

- **Eligibility Determination:** The current appeals process is available to individuals whose application for certification or recertification has been denied.
- **Exam Results:** Section IV.8 of the Charter (page 8) states that “Exam results are not eligible for appeal.” The NCCA recently published an interpretation of Standard 6.C that states “An appeals policy that prohibits a candidate’s or certificant’s right to appeal any decision made by a certification body related to those areas noted in Essential Element C would not be in compliance with Standard 6.” The full text of the interpretation is available at <http://www.noca.org/portals/0/Stnd%206C%20approved%203-31-09.pdf>. The Charter should be amended to allow individuals who fail the exam access to the appeals procedure. The new appeals policy should also be published on the web site or in other candidate materials.
- **Certification Status:** The appeals process is available to individuals whose certification has been revoked.

Currently there is limited information regarding the appeals process on the ASFPM web site at <http://www.floods.org/Certification/certprog.asp>. Included in this information is the statement “...the person may appeal to the CBOR, according to the guidelines specified below.” However, the web page does not include the referenced guidelines. To correct this and ensure that the policy is “published” as required by the NCCA, the full guidelines should be added to the web page or readers of the page should be notified that they can obtain the full guidelines by contacting the ASFPM office.

Standard 6.B requires that the confidentiality policy include 3 components that address: (1) confidentiality of application status, (2) confidentiality of exam results, and (3) delineation of the circumstances under which confidential information may be disclosed. Currently there is a statement in the Application Package that provides some information, however a formal confidentiality policy should be developed that includes the three components listed above and also establishes criteria to ensure the secure access to and storage of confidential information. Information about confidentiality should be published on the ASFPM web site.

Standard 6 requires that the program publish a summary of certification statistics that, at a minimum, includes the number of candidates examined, pass/fail statistics, and the number of currently certified CFMs. Data from 2007 is available in the background document published at http://www.floods.org/Certification/CFM_History_12-09-08.pdf. This information should be updated at least once per year. Adding the summary of certification activities to the CFM information page at <http://www.floods.org/Certification/certprog.asp> may facilitate the process of keeping this information up to date.

Policies and procedures for compliance with the Americans with Disabilities Act and the existing 508C compliance policy should be published on the web site. The published information should include instructions to candidates for requesting special testing accommodations. A standard nondiscrimination statement should be added to the certification information on the web site. One appropriate location for this information would be in the section on eligibility. A sample statement is provided in Table 4 below.

Table 4

Sample Nondiscrimination Statement

The CFM program is offered to all eligible candidates, regardless of age, gender, race, religion, marital status, national origin or disability.

Standard 6 requires that the key certification policies and procedures be reviewed periodically. To comply with this portion of the standard the CBOR should amend the Charter to include a requirement for periodic policy and procedure review or create a quality assurance policy to address this and other quality issues.

NCCA Standard 7

This standard is partially met.

Standard 7 requires that the CFM program publish a description of the exam and a description of the research methods used to ensure exam validity.

The published information regarding the general exam description, exam availability, location, and fees is adequate to meet a portion of Standard 7. However, the following additional information should also be published:

- A description how and when exam results are received and what information will be included.
- An overview of how the exam is scored, how the passing score is determined, and what the score means.
- A description of how the exam is developed, including an overview of the job analysis process, development of the content outline, and an overview of the item writing and review process.

This information could be included in a candidate handbook and/or added to the current web site.

Please note that ASFPM does not currently have a candidate handbook for the CFM program. Most information provided to candidates is contained in a program brochure and on the ASFPM web site. A comprehensive candidate handbook can be a useful tool for providing information to exam candidates about the initial certification process and renewal requirements. The handbook is not a requirement, but is commonly used by most certification programs. Printing hard copies of the handbook is optional; many programs choose to make the handbook available as a downloadable PDF file from their web site.

NCCA Standard 8

This standard is met.

ASFPM reports that no individuals have been awarded the CFM designation without passing the exam.

NCCA Standard 9

This standard is met.

ASFPM maintains a list of current and previous certificants. A list of current CFMs is maintained on the ASFPM web site for verification purposes.

Assessment Instruments

National and State CFM Examinations

Currently there are two pathways to earning a CFM designation: (1) certification awarded by ASFPM directly to individuals who pass the national CFM exam and (2) certification awarded by a state, ASFPM chapter, state agency or regional association that has been accredited by CBOR. There are six states with ASFPM accredited programs: Arkansas, Illinois, New Mexico, North Carolina, Oklahoma, and Texas. Three of the six states use their own exam which is similar in content to the ASFPM exam. The remaining states use ASFPM exam items with minor changes to the test blueprint to reflect local/regional issues. All six states establish their own eligibility and renewal requirements and all 6 states set the passing point for their exams. There is no psychometric process in place to measure if the exam forms used by the states are equivalent in difficulty to the ASFPM CFM exam. There is also no psychometrically valid process in place for determining the passing point for each exam.

Given these issues it appears that the six state exams are unlikely to meet the NCCA's standards for assessment instruments.

There are currently no NCCA accredited certification programs that operate with a similar structure as the one described above. Therefore, it is difficult to predict how the NCCA Commission may evaluate this structure. It seems unlikely that the state exams could achieve NCCA accreditation without some significant changes.

The ASFPM CFM program's chances of achieving NCCA accreditation will be increased if the application is submitted only for the national CFM program. It is likely that the NCCA will consider the six state programs as six separate designations.

The state CFM programs may wish to submit separate NCCA applications, but they should only do so if they can document full compliance with all of the NCCA Standards, including the exam-related standards.

General Issues Related to Assessment Instruments

For the purposes of this report, the review focused on the accreditation standards related to the administrative aspects of the program (NCCA Standards 1-9 and 19-20). The standards pertaining to assessment instruments (standards 10-18) are being addressed separately by the Ohio State University Center for Education and Training for Employment (CETE). Because of the ongoing work being performed by CETE, compliance with Standards 10-18 was not evaluated during the preparation of this report.

However, as there is some overlap between the various standards in terms of what must be published and/or included in policy documents, the following points should be noted:

- Standard 12: The cut score (or passing score) must be set using generally accepted psychometric principles and a report documenting the methods and procedures used to establish the cut score is required. The CBOR Charter states that the passing point for the exam is 70%. Once a cut score study has been completed this language should be updated to reflect the process used to develop the cut score. As the cut score may change over time with the introduction of new exam forms it is advisable not to print a specific score in documents that are not updated regularly.
- Standard 15: The CFM program must demonstrate that different forms of the exam assess equivalent content. It appears that the CFM program currently only has one form of the exam. Plans should be made to eventually introduce multiple forms and a policy should be created which states how often new forms are introduced and when old forms should be retired.
- Standards 17-18: The CFM program should have a record retention policy that addresses the retention of exam development materials (job analysis, test blueprints, item bank, cut score studies, etc.), exams, and exam results. A record retention schedule should be added to the current "Recordkeeping" section of the CBOR Charter.
- Standards 16-18: The CFM program should develop a security policy that addresses how confidential documents are retained in a secure manner. The security policy should address: what materials are considered to be confidential and are expected to be kept secure at all times; describe how confidential documents and electronic files are retained securely; describe who has access to what secure information (including confidential candidate/certificant information, exam items, exam forms); procedures for terminating access when employees or volunteers no longer need access; procedures for transmitting confidential materials; requirements for consultants/vendors; training of staff (initial and ongoing); visitor access to areas where secure/confidential materials are stored; procedures if a security breach occurs; requirements for data backup.

Recertification

NCCA Standard 19

This standard is partially met.

Standard 19 requires that published recertification information include the rationale for the renewal time interval. A written rationale for the two year renewal time period should be added to the web site and/or other published materials.

NCCA Standard 20

This standard is not met.

Standard 20 requires that the CFM program demonstrate how the renewal policy contributes to the professional development of CFMs. This should include the CBOR's rationale for how the continuing education requirement supports

the professional development of CFMs and how it enhances their continued competence. This information should be included in the continuing education section of the ASFPM web site or in other recertification materials.

Conclusion

Overall, the existing policy documents and published materials for the CFM program are well organized, clear, and detailed. The CFM program will be well positioned to apply for NCCA accreditation following the exam development work being performed by CETE and implementation of the changes in the areas listed below and detailed in this report:

- Governance:
 - › Grant the CBOR additional autonomy in regard to setting policies for the CFM program.
 - › Adjust the selection process for CBOR members to provide sufficient independence.
 - › Add a public member position to the CBOR.
- Policies & Procedures:
 - › Revise the current appeals policy.
 - › Create policies regarding nondiscrimination and ADA compliance.
 - › Create a formal confidentiality policy.
 - › Create a record retention policy.
 - › Create a security policy.
 - › Consider organizing all policies in a formal policy and procedure manual.
- Information for Candidates/Published Information:
 - › Update certification statistics at least annually.
 - › Publish confidentiality and ADA compliance policy.
 - › Publish additional exam development information.
 - › Publish the rationale for the recertification time period.
 - › Publish information on how the recertification policy contributes to the professional development of CFMs.
 - › Consider creating a comprehensive candidate handbook.

Please feel free to contact me at 877-619-9885 x 702 or jmoore@seacrestcompany.com to discuss any of the issues raised in this report.

Please note that no individual can represent the determination of the full NCCA Commission when they meet to review a complete accreditation application package. Implementation of the recommendations in this report is not a guarantee that accreditation will be granted. Testing documentation was not reviewed during the preparation of this report, a psychometric analysis is not included, and a psychometrician was not involved in the preparation of this report.

Attachment A

List of Materials Reviewed

- <http://www.floods.org/home/default.asp>
- Annual Report to Members 2007-2008
- Application Package for the Certified Floodplain Manager Program (dated 8/23/2007)
- Articles of Incorporation
- ASFPM Accredited State Program Renewal Application 2009 (dated 12/28/2008)
- ASFPM Board Sheet (dated 3/9/2009)
- ASFPM CFM Renewal Application (dated 11/11/2008)
- ASFPM CFM Retake Application (dated 9/17/2007)
- ASFPM Certified Floodplain Manager (CFM) Exam Program Evaluation (dated 11/12/2003)
- ASFPM Organizational Chart
- A Practical Guide to Maintaining Certified Status for Your CFM (dated 3/15/2005)
- Background of the Certified Floodplain Manager (CFM) Program (dated March 2009)
- CBOR 5-Year Strategic Plan (dated 12/6/2006)
- CBOR Committees Roles and Responsibilities (dated 2009)
- CFM Certificate of Registration
- CFM Exam Proctors "Helpful Hints"(dated 5/13/2008)
- CFM Exam Requirements for 508C Compliance (dated 11/28/2005)
- CFM Stamp Sample
- CFM Stamp Usage Guidelines (dated 7/23/2008)
- Certification Board of Regents Contact List (dated 2/23/2009)
- Certified Floodplain Manager Program power point presentation
- "Certified Floodplain Manager Program" tri-fold brochure (dated 5/2008)
- Charter for the Certified Floodplain Manager Program (dated 3/5/2009)
- Continuing Education Policy
- Exam Checklist (dated 12/1/2008)
- Exam Hosting Policy and Procedures (dated 9/20/2007)
- Exam Preparation Guide for the Certified Floodplain Manager Program
- Exam Taker's Instructions (dated 5/13/2008)

- Financial Data: CFMASFMP – Certification Program – Program Transactions for Period 7/1/2007 to 6/30/2008 (dated 4/23/2009)
- Floodplain Management Body of Knowledge (dated 12/15/2007)
- Interim Reciprocity Policy (Draft, dated 2/26/2009)
- Memorandum of Agreement, CFM Program 2009 (dated 12/5/2008)
- Memorandum #5, National Certified Floodplain Manager Program (dated 11/25/1997)
- Memorandum #9, ASFPM Certified Floodplain Manager Program (dated 2/22/1998)
- Model Job Description for a Community Floodplain Manager
- National Floodplain Managers Program 1997 Work Plan
- National and State CFM Program Consistency White Paper (dated 4/3/2008)
- Proctor's Agreement (dated 10/29/2002)
- Proctor's Checklist
- Proctor's Instructions (dated 3/19/2008)
- Professional Development Committee 2007-2008 Report
- Professional Development Committee 1995-1996 Progress Report
- Sample Letters/Forms:
 - 1 year renewal notice
 - 2 week renewal reminder
 - CFM Certificate
 - Certification Exam Results
 - De-certification letters
 - Non-member renewal letter
 - Pass/fail letters
 - Renewal letter
 - Supervisor letter
- SeaCrest Accreditation Needs Assessment Questionnaire
- Sub Committee for ASFPM Floodplain Managers Certification Program Report to the Board (memo dated 5/9/1995)
- Sub Committee for ASFPM Floodplain Managers Certification Program Report to the Board (memo dated 5/3/1994)
- "When Flooding is a Problem in Your Community" brochure (dated 10/27/2007)

Attachment B – Terminology

Credentialing programs serve many purposes and audiences and the terminology used can vary as widely as the programs themselves. To ensure readers of this report have a common understanding of frequently used terminology the following definitions from [NOCA's Basic Guide to Credentialing Terminology](#) (October 2006) are provided for your reference:

Accreditation:

The voluntary process by which a nongovernmental agency grants a time-limited recognition to an institution, organization, business, or other entity after verifying that it has met predetermined and standardized criteria.

Assessment Instruments:

Any one of several standardized methods for determining if candidates possess the necessary knowledge and/or skill related to the purpose of the certification.¹

Certificate Program:

A training program on a topic for which participants receive a certificate after attendance and/or completion of the coursework. Some programs also require successful demonstration of attainment of the course objectives. One who completes a professional certificate program is known as a certificate holder. A credential is usually NOT granted at the completion of a certificate program. There are three types of certificate programs: knowledge-based certificate, curriculum based certificate, and certificate of attendance or participation.

Certification:

1. A process, often voluntary, by which individuals who have demonstrated the level of knowledge and skill required in the profession, occupation, role, or skill are identified to the public and other stakeholders. *2004 Standards Glossary.*
2. The voluntary process by which a non-governmental entity grants a time-limited recognition and use of a credential to an individual after verifying that he or she has met predetermined and standardized criteria. It is the vehicle that a profession or occupation uses to differentiate among its members, using standards, sometimes developed through a consensus-driven process, based on existing legal and psychometric requirements. *2005 NOCA Guide.*

Certification Agency:

The organizational or administrative unit that offers and/or operates a certification program.

Certification Board:

A group of individuals appointed or elected to govern one or more certification programs as well as the certification agency, and responsible for all certification decision making, including governance.

Certification Program:

The standards, policies, procedures, assessment instruments, and related products and activities through which individuals are publicly identified as qualified in a profession, occupation, role, or skill.

Credentialing:

The umbrella term that includes the concepts of accreditation, licensure, registration, and professional certification. Credentialing can establish criteria for fairness, quality, competence, and/or safety for professional services provided by authorized individuals, for products, or for educational endeavors. Credentialing is the process by which an entity,

¹ For the purpose of this Needs Assessment the terms “exam” or “test” are used to describe the assessment instruments. However, a traditional multiple-choice test is only one of many acceptable assessment instruments.

authorized and qualified to do so, grants formal recognition to, or records the recognition status of individuals, organizations, institutions, programs, processes, services, or products that meet predetermined and standardized criteria.

Grandfathering:

The process by which individuals are granted certification without being required to meet a formal examination requirement. This process is frequently invoked when a certification program is initiated, as a way of recognizing the experience and expertise of long-term experts, and/or to allow grandfathered individuals to develop the initial form(s) of the certification examination. Individuals initially certified through grandfathering may, in the future, be required to pass a form of the certification examination they did not participate in developing in order to maintain certification.

Governing Committee:

A group of individuals appointed or elected to formulate and implement policy related to certification program operation. The NCCA uses this term to denote those committees that are given complete authority over all essential certification decisions.

Knowledge-based Certificate:

Recognizes a relatively narrow scope of specialized knowledge used in performing duties or tasks required by a certain profession or occupation. This certificate is issued after the individual passes an assessment instrument.

Psychometrics:

The science and technology of mental measurement, including psychology, behavioral science, education, statistics, and information technology.

Psychometrician:

A practitioner of psychometrics; an individual who normally holds a doctoral degree in measurement or a discipline of psychology (such as educational or industrial/organizational psychology) who can understand, apply, and describe the science and technology of mental measurement.

Publish:

Make available in hardcopy, electronic, or web-based formats and easily accessible and available on request. The degree of accessibility may be a function of the level of confidentiality of the information. *2004 Standards Glossary*.

Attachment C

Public Member Criteria

As stated in the NCCA Standards: "A public member is considered by NCCA to be a person who represents the direct and indirect users of certificants' skills/services. Because this may be defined very broadly, a rotating system for representation of various publics may be implemented over time. The public member may be a professional, but should not have similar credentials to the certificants. The public member should not be a member of a related profession or a profession that provides services that are complementary to certificants' services. The NCCA recommends, but does not require, that the public member has been or is a potential consumer of the certificants' skills or services. It is also recommended that public members have experience with public advocacy."

The public member should **NOT** be:

- A current or previous member of the floodplain management profession.
- A member of a profession related to floodplain management that provides complementary services to the CFM's services.
- An employer or an employee of floodplain management professionals.
- An employee of a CFM or of an employer of CFMs.
- An employee of any certification organization.
- Currently deriving more than 5% of their total income from the floodplain management profession.

The public member should **NOT** have:

- Derived in any of the 5 years preceding appointment as a public member on the CBOR more than 5% of their total income from the floodplain management profession.
- Worked for or provided contract services to the ASFPM or state charters at any time during the 5 years preceding appointment as a public member on the CBOR.

SECTION 3) ASSESSMENT INSTRUMENTS COMPLIANCE AND ANALYSIS

Prepared by Dr. James Austin with assistance from Michael Wonacott

This section first presents a compliance table with summary and recommendations concerning NCCA Accreditation Standards 10-18. Following the table is a detailed analysis against those standards. Please note that the SeaCrest Companies report (Section 2) specifically mentions Standards 7, 12, 15, 17-18, and 16-18. According to the CETE and SeaCrest understanding of the project, these recommendations are advisory to ASFPM. That body is free, therefore, to incorporate them as determined by strategic objectives and timing (not all recommendations need to be put into place immediately). These recommendations are also useful, independent of accreditation, for continuous improvement of the CFM® program. The section is guided by the purpose stated in the RFP of possible NCCA accreditation (through comparison of the CFM program documentation to 21 standards), thus the key references are the NCCA Accreditation Standards (2004) and *Certification: The ICE handbook* from the Institute for Credentialing Excellence (Knapp, Anderson, & Wild, 2009). A secondary source would be the ISO/IEC 17024 standard.

A brief glossary of targeted terms is provided immediately below (see SeaCrest Attachment B for another) and a basic guide to terminology published in 2006 is available at the Institute for Credentialing Excellence (formerly NOCA) website (www.credentialingexcellence.org).

Examination Specification (test blueprint) outlines how questions are allocated in an assessment instrument. Common specifications in credentialing use topics, tasks, or knowledge with sub-scores specified if required. A blueprint may include a facet that specifies questions in terms of complexity (recall, application, analysis).

Practice Analysis refers to the systematic analysis of an occupation or profession across different work settings in which individuals-to-be-certified work rather than a typical job analysis within a specific work organization. DACUM (Developing A Curriculum) was the practice analysis method used for the CFM® project.

Question (Item) refers to the method of posing a task to the test-taker. Questions are analyzed in terms of their difficulty (how many test-takers answered correctly?) and their discrimination among test-takers (is there a relationship between answering the question correctly and the total score on the test?).

Reliability (high) refers to the absence of random measurement error in an assessment instrument. Methods for estimating reliability rely on samples of test-takers, forms of the instrument, and single or repeated occasions.

Validity refers to evidence supporting test score interpretations. For the CFM® program, the tests score interpretation involves whether a person passes to satisfy the major requirement for awarding a credential. Different strategies for validation, as for estimation of reliability, require different actions by the certification body or psychometrician. The evidence for the CFM® program is based on showing that questions sample a practice domain (consisting of Examination Topics with subordinate DACUM Knowledge Areas).

In completing this compliance audit, the documents reviewed by CETE staff were the following:

- CFM® Exam Proctors "Helpful Hints"(dated 5/13/2008)
- Exam Checklist (dated 12/1/2008)
- Exam Hosting Policy and Procedures (dated 9/20/2007)
- Exam Preparation Guide for the Certified Floodplain Manager Program
- Exam Taker's Instructions (dated 5/13/2008)
- Floodplain Management Body of Knowledge (dated 12/15/2007)
- Proctor's Agreement (dated 10/29/2002)
- Proctor's Checklist
- Proctor's Instructions (dated 3/19/2008)
- Letters to passing and failing candidates (including cross-tabulated database query)
- CBOR Analysis of CFM® program against Standards for Educational and Psychological Tests

Compliance Summary: Review Against NCCA Standards 10-18 for Assessment Instruments

Key:

Met: Standard is met and documentation is sufficient to demonstrate compliance

Partial: Standard may be met in practice, but documentation is not sufficient for full compliance

Not Met: Standard is not met and changes should be implemented to achieve compliance

Standard	Compliance	Summary/Recommendations
10	Partial	<p>SUMMARY: A DACUM occupational analysis for Floodplain Manager and an online verification survey were conducted; those results together with alignment judgments by the Subject Matter Expert panel were used to create an examination specification (test blueprint).</p> <p>RECOMMENDATIONS: <i>--CETE recommends, consistent with this standard, that ASFPM publish details of the practice domain occupational analysis. This information should be published so that it is widely accessible to the membership.</i> <i>--CETE recommends that these activities be repeated regularly to ensure that the examination is always based on current occupational information. A five-year cycle is common. The standard requires a rationale for the choice of cycle; the rationale should be provided by ASFPM based on how rapidly the practice domain changes. Annual updating is another option.</i> <i>--Currently, the examination specification [test blueprint] is available to ASFPM members only for traditional topic areas; it should be supplemented with the DACUM knowledge areas (perhaps in the Body of Knowledge document).</i> </p>
11	Partial	<p>SUMMARY: Working to evaluate and expand an existing bank of multiple choice questions required creativity. Following generally-accepted psychometric principles, a panel of practitioners aligned an existing bank of 181 questions (mostly MCQ) to the Topic Areas and DACUM Knowledge Areas at a 3-day workshop (November 2009). Questions were categorized as keep, drop, or modify. New questions were written to fill gaps in the question bank by topics near the end of this workshop and before a subsequent item review session (February 2010). The bank of questions consisting of 182 questions was reviewed and rated by a seven-member panel of practitioners in order 1) to establish content validity and 2) to establish a defensible cut score for decision-making about awarding the CFM® certification.</p> <p>RECOMMENDATIONS: <i>--CETE recommends that ASFPM continue to implement generally accepted, benchmark tasks for the CFM® question bank, including test cycle maintenance and adding questions to the bank.</i> <i>--CETE recommends that ASFPM increase the size of the CFM® question bank to create multiple forms of the examination and to minimize question exposure (to test-takers). The forms should be equivalent in terms of question difficulty (it should not matter which form a test-taker receives in terms of score). The current practice of reorganizing the same set of questions into two forms is inappropriate for this purpose. CETE also recognizes that this recommendation may take time to implement, which provides the added benefit of allowing for a strategic process to include communication and engagement of the ASFPM membership.</i> </p>

Standard	Compliance	Summary/Recommendations
		<p>--CETE recommends a regular review process for the question bank (annual seems to correspond to benchmarked practice in certifications). This process should be structured in two parts and make use of individual statistics for each question (1—how many test-takers answered it correctly, 2—what is the “discrimination power” or differentiation of the question among low- and high-scoring test-takers, 3—how many test-takers selected incorrect options). Most attention should be paid to the questions-in-use for the examination cycle, but some attention should always be paid to growing the question bank through creating parallel questions (using “better” questions defined by difficulty-discrimination as the source for parallel question ideas) and adding scenarios and associated questions.</p> <p>--CETE recommends that the question bank be stored in a structured database similar to the one turned over to ASFPM as a deliverable of this R&V project. Following this recommendation will enhance the capability of ASFPM staff to manage the CFM® program and to improve examination quality. This database should contain tables for storing secure materials (questions and candidate responses) and may also list individuals participating in examination development (SME table).</p> <p>--CETE recommends that the examination specification (test blueprint) be reviewed annually to see if changes are warranted. As part of the review, the exact percentages associated with each topic for the examination should be provided to stakeholders. This review could be completed as part of test cycle maintenance, and published as an annual report on the CFM® program.</p> <p>--CETE staff recommends that questions added to the bank undergo the same review process with cut score judgments and Essentiality-Quality averages imported into the bank and tagged to questions.</p>
12	Not Met	<p><u>SUMMARY:</u></p> <p>Practice had been to use 70% (derived by benchmarking other examinations). Project staff conducted a two-day workshop in February 2010 with seven subject matter experts to establish a defensible cut score using the Angoff procedure and the concept of a Minimally Competent Candidate. All panel members had attended the workshop in November, were familiar with the examination as current CBOR members, and were holders of the CFM®. Questions from the bank (182) were finalized and printed for review / rating. Printouts provided the questions (scenarios if applicable), answer options, and correct option as well as aligned Topic / Knowledge Area. Training for making ratings (Essentiality, Quality) and Angoff judgments was provided. Essentiality requires raters to judge importance of the knowledge assessed in relation to the linkage of each question to the domain of knowledge (Examination Topic/DACUM Knowledge Area), while quality requires an overall evaluation of stem, scenario, options, and graphics. First, in advance of the workshop a presentation was distributed to orient the panel to the judgments and followed up with a conference call for clarification. Second, the judgment tasks were again discussed at the workshop to ensure that all participants clearly understood the tasks and especially the concept of the Minimally Competent Candidate. Practice making ratings and sharing reasoning was used to increase understanding and shared frame of reference. Analysis of the Angoff judgments by panel members indicated high internal consistency reliability (.88, .92) but lower inter-rater reliability (.62 for Round 2); the average Angoff weight across questions and panel members was 74.43 (SD=4.94) for Round 1 and 75.72 (SD=4.56) for Round 2. Note that this Round 2 cut score average would be appropriate if test-takers were taking <u>all questions</u> judged in the workshop. <u>Although any actual cutoff score would vary with specific questions</u></p>

Standard	Compliance	Summary/Recommendations
		<p>selected for the form, discussions with the panel indicated general comfort with raising the cut score by as much as five points.</p> <p><u>RECOMMENDATIONS:</u></p> <p>--CETE staff recommends that the cut score for each examination be developed from the Angoff weights attached to the questions selected for the form. This will demonstrate compliance with this NCCA standard.</p> <p>--CETE staff notes that creating two equivalent forms will require calculation of two cut scores from the question weights in the question bank. Questions selected for forms will yield slightly different cut scores and either an average or separate cut scores could be used.</p>
13	Partial	<p><u>SUMMARY:</u></p> <p>CETE staff reviewed current scoring, interpretation, and reporting procedures in place for the CFM® system. In making these recommendations, guidance was provided by general best practices in testing.</p> <p><u>RECOMMENDATIONS:</u></p> <p>--CETE recommends that ASFPM consider the components that comprise this accreditation standard: scoring, interpreting, and reporting.</p> <p>--Current scoring is Right-Wrong (1=right or 0=wrong assigned to all responses by a test-taker and should be stored in the candidate database table) with a single point per question, but some questions appear to be more difficult (interpretation of elevation certificates and maps); increased difficulty might support a different scoring model in the future.</p> <p>--CETE recommends that the current interpretation of Pass/Fail categories be enhanced to incorporate the results of the DACUM practice analysis and Examination Specification (test blueprint). A possible revision to score interpretation might be written using the concept of minimal competence and by reference to the content-oriented test development:</p> <ol style="list-style-type: none"> 1) definition of the practice domain in terms of Duties-Tasks, Knowledge Areas, & Skills (DACUM research chart) 2) verification of DACUM chart elements using an online survey with good response from the ASFPM membership 3) alignments by subject matter experts between DACUM Duties, DACUM Knowledge Areas, and CFM® Examination Topics 4) subject matter expert allocations of question percentages to CFM® examination topics and ranking of those seven topics on importance <p>--CETE recommends that reporting, after two forms are implemented use a standard rather than a raw score for the total. Details are available for various specific standard scores (T-score) in psychometric textbooks. The T-score expresses a person's raw test score in a distribution with mean (average) of 50 and standard deviation 10; cutoff scores can be used for decision-making.</p> <p>--CETE recommends that reporting of scores by topic for the Examination Topics be considered for its effects on reliability (some topics have fewer questions and may not be as reliable as topics with more questions, for example Overall Context of Floodplain Management compared to Floodplain Mapping and NFIP Regulatory Standards).</p>
14	Partial	<p><u>SUMMARY:</u></p> <p>As part of the "item" analysis reported above for NCCA Standard 13, the reliability of test-taker responses was estimated to gauge the extent of random measurement error under the internal consistency model of reliability. Reliability was estimated for</p>

Standard	Compliance	Summary/Recommendations
		<p>test forms with adequate numbers of test-takers (# test-takers > 120). The results for a number of exam forms are shown in a table in the detailed analysis part of this section, but the overall reliability values are all above .81 (Current exam reliability is .85 and .87 for Series A and B). CETE believes that an examination of 120 items might attain a reliability >.90 with proper question bank maintenance and growth. There has been no publication of reliability estimates because they have not been calculated in the past.</p> <p><u>RECOMMENDATIONS:</u></p> <p>--CETE staff recommends repeating this reliability analysis as part of annual examination maintenance; the results should be reported as part of the annual summary from the CBOR Professional Development Committee (note that other materials are suggested throughout for this annual report).</p> <p>--CETE staff recommends adding topic area reliability to the overall reliability analysis to assist in reporting topic areas to failing candidates (see above). Only the items pertaining to a specific topic are analyzed. Making sure that feedback is reliable for the smaller topic areas supports fairness for test-takers.</p> <p>--CETE recommends that ASFPM attempt, over time, to increase reliability by enhancing quality of examination questions. Even though the reliability estimates are respectable (>.81), they could be higher still (>.90) – this recommendation is based on the observation that many questions are answered correctly by more than 80-85% of the test-takers. These questions do NOT contribute to the information provided by test scores. Such easy questions should be minimized and a desired range of question difficulty between 20% and 80% should be sought. The “item” analysis tables for Examination 09 in the attachments mark questions above 80% correct (red shading or font). A second aspect is the discrimination of the items, and negative question-total score correlations should be dropped or modified.</p> <p>--CETE recommends that ASFPM consider additional methods of reliability estimation for future investigations of the CFM® program. Additional methods of estimating reliability are “retest” in which the same sample takes the test after an interval or and “parallel forms” in which the group takes all forms of the examination. Psychometric consulting would be helpful in completing and documenting such investigations for the accreditation standards.</p>
15	Not Met	<p><u>SUMMARY:</u></p> <p>Because the CFM® examination consists of a single set of questions rearranged into two forms, there are not equivalent forms in the psychometric sense. The recommendations below provide some guidance for ASFPM in moving deliberately over time toward two or more equivalent forms of the examination. At that point, with proper documentation of equivalence the standard can be reevaluated.</p> <p><u>RECOMMENDATIONS:</u></p> <p>--CETE recommends that ASFPM over time increase the size of the question bank to support two equivalent forms with a common core of 40 questions. This requires developing approximately 160 distinct questions and 40 common core questions. Each form would then consist of the 40 common questions plus 80 unique questions. The set of common questions can be determined judgmentally or using statistics from “item analysis”.</p> <p>--CETE recommends that ASFPM conduct psychometric investigations of the equivalence of forms when the question bank is sufficiently large to support multiple forms. Several designs are possible for the psychometric</p>

Standard	Compliance	Summary/Recommendations
		<i>investigations. One such study might consist of a single large group that takes all questions in the bank, while another study would consist of two groups that take forms with common questions. Either classical test theory or item response theory can be used to analyze the test-taker data and document equivalence.</i>
16	Met	<p><u>SUMMARY:</u> The CFM® program represents ASFPM intellectual property, which must be safeguarded to ensure score integrity. Based on a review of documents and materials provided by ASFPM, including procedures and proctor agreements, good procedures are in place for secure proctored examination administration. Because ASFPM handles its own testing, the materials are internal and not handled by a test delivery sub-contractor (forms document question change process for CBOR members). Best practices in psychometrics, however, suggest that monitoring for cheating (by test-takers) and piracy (stealing questions or test forms) be conducted and communicated. As noted in the SeaCrest report above, a security policy should be created and disseminated.</p> <p><u>RECOMMENDATIONS:</u> --CETE recommends that ASFPM consider regular monitoring of examination delivery, forms, and questions to detect potential cheating. Some techniques can be implemented by ASFPM (exceptions reports from examination administration sessions; analysis of examination averages by proctor; tracking question "exposure") and others (statistical-psychometric analysis of patterns of test-taker responses either generally or when cheating is suspected) might require a vendor. One vendor is Caveon (www.caveon.org), but there are other providers of services such as penetration attempts. --CETE recommends that ASFPM consider requiring test-takers to sign assurances that they have neither given nor received assistance on the examination. This assurance could be accomplished at administration of the examination or as part of the registration process. --CETE concurs with the SeaCrest recommendation (above) that suggests development and dissemination of a CFM® candidate handbook. If desired, ASFPM staff can locate good examples via Internet search (e.g., International Code Commission, National Council of State Boards of Nursing). Ensure that policies and procedures subject to change are referenced somewhere that they can be changed easily without reissuing documents.</p>
17	Partially Met	<p><u>SUMMARY:</u> This standard (related also to Standard 7) pertains to documentation and retention of information about examination development, which is a key feature for NCCA and ISO accreditation systems and for ensuring due process with certification candidates. As noted in the SeaCrest report above, ASFPM has many policies in place, as well as procedures for regular review, modification, and publication of test questions. Many products of this project are relevant for documenting compliance with this standard.</p> <p><u>RECOMMENDATIONS:</u> --CETE staff recommends that current documentation and retention policies be extended to the data, results, and reports of this R&V Audit project. --CETE staff suggests that the proposed database of examination questions be maintained securely with encryption, user controls or permissions (password), and access recording (who accessed the database, when, and why). See</p>

Standard	Compliance	Summary/Recommendations
		<i>Standard 18 below for candidate response secure storage.</i>
18	Partial	<p><u>SUMMARY:</u> Just as for Standard 17, which pertains to the examination questions, secure storage of candidate materials is highly desirable for reasons of privacy and due process. Test-taker responses deserve the same level of attention and diligence as the database of examination questions and the printed test forms. CETE understanding is that all examinations are stored at ASFPM headquarters.</p> <p><u>RECOMMENDATIONS:</u> --CETE recommends that a records retention interval with rationale be established for these materials. --CETE, consistent with test security and protection of ASFPM intellectual property, recommends that secure shredding always be the method of destruction of old test materials.</p>

DETAILED ANALYSIS of Assessment Instrument Standards

NCCA Standard 10

This standard with two essential elements is partially met. Publication of the results (Essential Element B) is required for full compliance, and this should be done for and from the perspective of the ASFPM membership.

The content domain of Floodplain Management was defined using a DACUM process that resulted in a research chart representing the knowledge-practice domain, then verified with a large-scale survey of ASFPM members. The practice side was defined in terms of Duties and Tasks; the practitioner side was defined in terms of Knowledge and Skills. The process of DACUM Workshop (#1) and the verification survey is described below.

One of the cornerstones of certification and licensure testing is the delineation of a body of knowledge or practice domain for the profession. This process helps to specify the examination specification / test blueprint and can be applied to other programs of the certifying agency (training or professional development). CETE staff collaboratively planned with ASFPM (for example, discussions of recruiting specifications for the 7-12 panel members) and conducted an occupational practice analysis at CETE (July, 20-21, 2009). The panel was facilitated using the DACUM (Developing a Curriculum) process. Eleven (11) Subject Matter Experts, all holders of the CFM®, participated in the two-day session. Several of those individuals then participated in subsequent workshops for continuity. The DACUM process calls for a committee of 7-12 expert workers to work within a structured process (facilitated storyboarding) to generate broad duties through brainstorming and recall, then to delineate subordinate tasks, as well as general knowledge and skills, worker behaviors (attitudes, personality traits), future trends and concerns, and abbreviations-acronyms used in the field. The purpose of the DACUM process was to describe the occupation of floodplain management through experienced workers, in order to support the examination specification (test blueprint).

Following the creation of the initial DACUM chart, a follow-up review was coordinated with the panel by ASFPM to create a pre-verification DACUM Research Chart for Floodplain Managers. Among the

changes recommended by the panel were the following: a) dropping two duties (H and I) from consideration for certification testing (subsequent project work was performed on Duties A-G) and b) modifying several of the general Knowledge-Skill statements. This pre-verification chart and the panel membership are provided in the Attachments. After the finalization of the DACUM chart, an online survey was conducted to verify the practice analysis and to provide ratings for the creation of a test specification-blueprint. The online survey was conducted by CETE staff using the SurveyMonkey tool. The survey was reviewed by ASFPM staff and was launched with an email from the President of CBOR, on August 26, 2009. The survey remained online until September 14, 2009 and 2187 members responded to the survey, with between 1572 and 1582 individuals providing complete responses (response rate was 26%). CETE transferred a “final” DACUM chart during August, 2009 and transferred the survey and associated response data to ASFPM during September, 2009.

Among the analyses of survey responses were various descriptive frequency counts for background variables such as education, level, and salary (the latter requested by ASFPM to leverage the results of the survey). One hundred eight (108) tasks, grouped under Duties A-G, were rated on importance (scaled 0-4) and frequency (scaled 0-6). Twenty-four knowledge areas and thirteen skill statements were rated on importance (scaled 0-4) and familiarity (scaled 0-4). Using the two ratings for each task, a single criticality variable was calculated as the product of Importance and Frequency (weighted 70-30 per the survey question) in order to suggest the more important tasks and duties for alignment and for drafting a test blueprint for question writing. Importance (scaled 0-3) was used to represent Knowledge Areas in the alignment, examination specification (test blueprint), and question writing. A strategic decision was made to focus on the traditional ASFPM examination topics and DACUM knowledge areas for the examination specification and to use the Duty-Task information to support question writing (task as context). This support can be used over time, certainly in creating new questions that involve tasks identified as critical.

The DACUM chart, verification survey, and all data collected are the intellectual property of ASFPM. Many of these materials have been transferred to ASFPM staff. Another way to understand the practice analysis is to realize that the material represents a body of knowledge (BOK) as discussed by Rops (2002). CETE project staff suggests consideration of additional uses of the occupational practice analysis of Floodplain Managers. Among them are the differences between knowledge or skill importance and the associated familiarity (a discrepancy that can be used strategically in developing training and preparation materials, typified by high discrepancies for knowledge areas judged to be important in the future, for example GPS and GIS). Another use of the data is to examine sub-groups of the respondents (by filtering the data, for example, on “occupation level” of the respondent as local, state, Federal, or private), or using more refined filters such as the two-way breakdown of level and private sector). This data from the verification survey can also be used to consider additional certifications. Specifically, the current CFM® is an “entry” credential and it may be possible to develop an advanced or expert designation which would require a more challenging examination (perhaps with an oral testing component administered by a panel of master practitioners).

NCCA Standard 11

This standard with five essential elements is partially met because of the series of workshops and products of this project. Attachment D provides workflow of the project. Continuing use of similar psychometric practices for examination planning, question development, and question bank maintenance with associated documentation (See Standard 17) is required for full compliance.

Workshop #2 [Question Alignment-Revision-Creation]

Credentialing examinations are often constructed, reviewed, and maintained using workshops at which subject matter experts collaborate with certification and psychometric staff. CETE staff prepared and conducted a three-day workshop in early November 2009. Preparation activities by CETE project staff used the information from the DACUM practice analysis verification survey (n=1582) and other source materials provided by ASFPM (FEMA regulations, elevation certificates, copies of the current examination), and a CETE question-writing application database (intranet) with questions (certification candidate test responses were stored and manipulated in another database). First preparations identified two pools of questions, one pool of 181 for which test-taker responses were adequate (number of test-takers for the series > 120) and the other pool of 296 for which test-taker responses were not adequate or the questions themselves were in partial form. A second part of the preparation prior to the workshop consisted of an editing of these two pools of questions by CETE staff. One product of the editorial process was a set of illustrations of common question writing issues that was used to train the panel members at the workshop to create the nucleus of a group of trained question writers for ASFPM in the future.

Participants. Thirteen (13) Subject Matter Experts attended this workshop. Three had participated in the DACUM process (providing continuity across phases of the project). This second workshop was designed to focus on 1) alignments for parts of the DACUM occupational practice analysis and current CFM Examination Topics, 2) test specification-blueprint sharing, 3) question linkage to test blueprint-specification, 4) question review and modification, and 5) new question creation.

Workshop Process. After a review of the background of the project and the DACUM occupational practice analysis with verification survey, the 13 panel members made a series of Yes-No judgments about relationships among work and worker components of practice. The following two-way alignments were judged by the panel: 1) CFM® Examination Topics (7), DACUM Duty Titles (7), and 3) DACUM General Knowledge Areas (24). These alignment judgments were entered into a spreadsheet to create a draft examination specification - test blueprint. They are found in Attachment E. Given the focus of the certification on occupational-technical knowledge, the best was to create an examination specification was to combine data from the alignment of CFM® Examination Topics to DACUM General Knowledge areas (7X24) and from the ratings of importance for the DACUM knowledge areas provided by verification survey respondents. The examination specification-blueprint is provided as Attachment F

To summarize, the current examination topic areas were viewed as the central pivot of the blueprint due to their longstanding usage by ASFPM. The logic was to incorporate the DACUM verification results to strengthen the system and minimize change. The following alignments were completed.

- Seven "Topic Areas" were aligned to 7 DACUM Duties by 13 Subject Matter Experts
SME Panel judged (Y-N) alignment (8/13 or .62 required to establish link)
- Seven Topic Areas were aligned to 24 General Knowledge statements by 13 SME
SME Panel judged (Y-N) alignment (8/13 or .62 required to establish link)
- Seven DACUM Duties were aligned to 24 General Knowledge statements by 13 SME
SME Panel judged (Y-N) alignment (8/13 or .62 required to establish link)

Another activity completed by the group between the first and second day was a review of the percentage allocations to the seven CFM® Examination Topics. Among the reasons for this review are

changes in the profession-occupation over time. The recommended allocation percentages from November and February workshops are provided in Attachment F.

The next step at the workshop was alignment of the question bank to the exam specification-blueprint. In similar projects, CETE staff has found that, when a certification system (test question bank) is being retrofitted to an occupational practice analysis, a linkage (alignment) between existing questions and the Examination Specification is required to determine surplus-gap status of the question bank and begin to document content validity. This step was accomplished by the group after the Examination Specification-Blueprint (Topic Area with supporting DACUM Knowledge Areas) was incorporated into the CETE database tool. This database tool, with a digital projector, allows a group to view the features of the question (stem-options, question difficulty values across different forms) and to make various judgments about features of the questions (Keep-Modify-Drop; content linkage to Topic Area and DACUM Knowledge; pertinent notes about the item).

While the alignment judgments were being entered for analysis, CETE staff conducted a review of general question writing rules, using examples drawn from the CFM Test Bank (181-question pool with test-taker data). This training informed question modifications that occurred during and after the alignment-linkage process, as well as the creation of additional questions for the bank. Although CETE staff members had planned to complete all test development and question review tasks at this workshop, the goal was not reached. Most of the second day was spent in question alignment and question modification, and this process spilled over into the third day. After this part was completed, the project team recommended moving to creation of new questions rather than beginning the question judgment procedures (content validation and cutoff score establishment). Eleven new questions, most based on narrative scenarios, was written in a short time and several participants stated that they felt comfortable writing questions on their own (several individuals sketched out new questions in writing, either stand-alone or questions linked to the new scenarios, and turned them in to Mr. John Ivey).

Final question review and cutoff score judgment tasks, which pertain to the validation aspect of the project, were not completed. A third workshop, described below, was required to complete the scope of work. A no-cost extension was used to complete the scope of work.

Additional Recommendations Pertinent to Standard 11

--If ASFPM wishes to conduct its own question analyses, Iteman 4 software (2010) from Assessment Systems Corporation (www.assess.com) is a recommended option. For a reasonable price (\$799) with relatively easy data input, this package estimates reliability and question statistics (difficulty, discrimination), as well as a graphic display that is helpful in identifying and diagnosing poor-performing questions. CETE recommends this software, but there are other options.

--CETE recommends that this core group of trained question writers within ASFPM be maintained and further developed. Honoring the question writing guidelines and providing practice in writing and reviewing questions will continue the progress from this R-V Audit, but adding to the group over time will also be important.

--CETE recommends that ASFPM consider adding different formats to the current MC questions in the bank. Matching, multiple true-or-false (rather than single true-false), and analogies are three examples of formats that could enhance the question bank. Haladyna (2004) provides guidance for developing and validating MCQ formats.

--CETE recommends that ASFPM consider replicating questions that work well in terms of the psychometric question analysis (when identified during the annual review, such questions can be replicated to help increase the number of quality questions in the bank).

--CETE recommends that ASFPM consider expanding its use of non-MC question formats, which currently make up ~20 of the 120 questions (interpreting FEMA Elevation Certificates and maps are the current non-MCQ formats). This

recommendation means that these formats should be carefully developed and deployed in the question bank and examination. Osterlind (1997) provides guidance for developing performance-based items.

--CETE also recommends that ASFPM consider lengthening the examination by 10-30 questions (to 130 to 150). Adding more questions to the test database also addresses expected lower reliability due to fewer questions in three of seven topics (Overall Context, Mitigation, and Natural-Beneficial Functions). Thus, increasing the reliability of each topic area helps to justify the best practice of reporting scores by topic area to candidates.

NCCA Standard 12

This standard with two essential elements is not met. However, use of the cut score “weights” as provided in the project database deliverable (future examination cycles) and documentation (See Standard 17) of cut score establishment and adjustments are required for full compliance in future examination cycles.

Workshop #3 [Question Finalization, Content Validation, Cut Score Determination]

Because the scope of work was not completed in November, a third workshop was held at CETE during February 2010. At this workshop, participants were a smaller subset of seven (7) individuals who had participated in the original test development workshop. All of these individuals were members of CBOR. The focus of the workshop was divided into two parts – Question Finalization followed by Content Validation and Passing Score Determination. On February 22, the sub-group finalized the questions and then transferred them to CETE for print production. Over the next two days (February 23-24), the group met at CETE for content validation and passing score determination (using the Angoff method). The two-day process consisted of five steps:

- 1) Brief project review (given that all participants had been engaged in the project);
- 2) Training in question reviews and understanding minimal competence (review of pre-distributed presentation);
- 3) Practice in making question and bank ratings on scan sheets (including sharing and justification of the ratings with other panelists),
- 4) Individual judgments for question essentiality, question quality, and Angoff rating for establishing a defensible passing score; and
- 5) A second round of Angoff judgments only in order to increase the reliability of the judgment process because the panel size was at the lower boundary for required sample.

Methods for speeding the process included sharing the question review training PPT with ASFPM staff and then with the panel, and then holding a teleconference with the panel during early February to ensure that there were minimal gaps in understanding of the process. For example, one panel member at the November and February workshops expressed concern that the structured judgments were “opinions” and thus inappropriate. This is common among individuals approaching cut score determination for the first time. It can be countered by noting that professional judgments are required within the profession itself and by noting that all passing points on examinations are judgmental and subjective (training and structuring judgments according to the well-established minimal competence framework and averaging multiple judgments help to avoid arbitrary capriciousness).

The analysis of data from the judgments indicated impressive internal consistency, with values ranging from .945 (Question Quality Judgments) to .986 (Round 1 Angoff minimal competence judgments). The inter-rater reliability, calculated using the Angoff Analysis Tool of Assessment Systems Corporation, was lower (.62 for Round 2 Angoff judgments).

Additional Recommendations Pertinent to Standard 12

--CETE staff recommends that ASFPM evaluate pass rates in future examination cycles. If information is collected and available for demographic variables (gender, ethnicity, or first language), pass-rates and average test scores can be calculated for sub-groups to evaluate the fairness of the examination. It might be better to be proactive on fairness (sometimes called bias) by collecting demographic data and conducting analysis rather than encountering a challenge and being forced into a reactive response.

--CETE staff recommends that ASFPM calculate the Conditional Standard Error of Measurement for the cut score (CSEM; under classical test theory, the SEM is a function of the observed score variability and the reliability and the CSEM is the SEM at a certain point or interval on the examination scale –here at or around the cut score). This recommendation will provide evidence to document the precision of measurement and support the use of the cut score in making decisions – in other words, a small CSEM at the cut score helps an auditor to understand that the pass-fail decision is not unduly influenced by random error of measurement.

--Additional guidance, should ASFPM decide to add performance-based items to the examination, is provided by ICE-NOCA through its publication *Setting Passing Standards for Performance-Based Certification and Licensure Examinations*.

NCCA Standard 13 (Scoring, Interpreting, Reporting)

This standard with three essential elements is partially met. Continuous use and documentation (See Standard 17) of generally accepted psychometric practices with rationales are required for full compliance.

ASFPM uses a single raw score in decision-making about awarding the CFM® designation to test-takers and reporting scores to passing-failing candidates. That total score is the sum of correct answers. No correction for guessing is applied. The obtained score of a test-taker is referenced to the current cut score of 70% (.70 X 120). If it is 84 or higher, the individual passes the examination and the major requirement for earning the CFM®. Maintenance of the CFM® is through continuing education.

The interpretation of the score does not take into account the seven topics of the examination specification, nor is this required. One implication, however, is that a test-taker can possibly compensate for poor performance in one or more sections by above-average performance in other areas. Note that the examination specification (test blueprint) ensures that more “weight” (more questions) is assigned to topics that are more important, specifically the Floodplain Mapping and the NFIP Regulatory Standard topics. More weight means more questions, therefore a test-taker must answer more questions correctly from these “important” sections because it is difficult to compensate in other topics due to a small number of questions (lower percentage means fewer questions on the examination). Another implication is that providing candidates who fail with tools to improve their performance on subsequent re-takes might require providing scores on parts of the examination. A psychometric dilemma is that the reliability of sub-scores from sections with small numbers of questions may be low, which is why a recommendation in the compliance table above concerns estimating the psychometric reliability for each of the topic areas. Increasing length of the examination, again, is one way to address concerns about compensatory performance by test takers.

It may be useful in the future to consider how the parts of the examination are related to each other by estimating correlations between scores on the sections. Further, some members of the cut score panel indicated during debriefing that there had been discussions about instituting a multiple hurdle system by which passing certain sections of the examination would be required in order to earn the designation.

Reporting scores can include total score (X correct of 120), sub-score (X correct for Examination Topic), pass-fail status, or combinations. In the future, continuing to report sub-scores is warranted if psychometric analysis of question difficulty/discrimination and sub-score reliability provides support. Continuing this step provides

information to failing candidates about areas of strength and weakness so that they can remediate their performance.

NCCA Standard 14

This standard with a single essential element is partially met. Continuing use and documentation (See Standard 17) of good psychometric practices (annual reliability estimation with question analysis used in bank maintenance) are required for full compliance.

Psychometric Question (Item) Analysis

A reliability analysis by CETE staff was begun during 2009 and completed during 2010 to address key objectives of the Reliability-Validity audit. This analysis resulted in estimated 1) reliability of the two tests in the series using a method called internal consistency which is based on correlations between questions; 2) statistical and psychometric characteristics of each question (difficulty in terms of the proportion responding correctly; discrimination in terms of the correlation between getting the question right-or-wrong and the total score); and 3) statistics for the each test series or form (including the average total score, variability of the total scores, and average and range of difficulties). Some of the results were imported into a CETE database and used during the workshop review (question difficulty). The first or preliminary question analysis was revised to take into account sponsor feedback, additional responses from test-takers (Series 09A and 09B, May to November 2009), and the test series comparison. When the difference between average scores (.820) for Series 09A and 09B was tested statistically with a t-test, the results indicated that the series were not statistically different: $t = 1.13$, $p = .2583$. The independent t-test results in a statistic (t) for which the value either supports a conclusion of significant differences (or does not) between the averages on the two series for Examination 09.

The first table below defines the variables reported in the summary of the Question ("Item") Analysis and gives their definitions to the right. The second table gives the estimated values for those series that had enough test-takers for analysis.

<i>Table Column</i>	<i>Definition</i>
Exam / Series	ASFPM Designators for the Cycle and Form
Dates Used	Range of dates from database field
# Tested	# Test-takers used in psychometric analysis of questions
Test Score	Sum of Right answers (Average & Standard Deviation)
Pass %	Percentage achieving score of 84 or higher
# Questions	# Questions used in psychometric analysis (may be < 120)
Reliability	Estimated internal consistency reliability using Cronbach's alpha (α)
Question-Total Correlation	Question (R-W) correlation with total score; average / standard deviation
Question Difficulty (p)	Proportion answering question correctly (average, min / max values)

Summary of Question Analysis for ASFPM CFM™ Examinations: By Exam and Series											
Exam	Dates	#	Test Score		Pass %	Questions	Reliability	iT Correlation		Question Difficulty	
			Avg	SD				Avg	Min/Max	Avg	Min/Max
01A	09/00–06/02	247	92.59	10.96	82.6%	119*	.863	.205	-.05/.45	.778	.25/.98
01B	09/00–06/02	215	91.94	11.68	81.4%	120	.876	.228	-.14/.50	.766	.21/.99
02A	08/02–12/04	544	91.34	9.72	81.3%	120	.817	.169	-.14/.42	.761	.20/.98

Summary of Question Analysis for ASFPM CFM™ Examinations: By Exam and Series											
Exam	Dates	#	Test Score		Pass %	Questions	Reliability	iT Correlation		Question Difficulty	
			Avg	SD				Avg	Min/Max	Avg	Min/Max
02B	08/02–12/04	482	91.66	10.53	82.8%	120	.846	.197	-.10/.47	.764	.21/.99
03A	01/05–12/05	289	91.45	9.97	79.6%	120	.827	.181	-.20/.43	.762	.20/.99
03B	01/05–12/05	232	90.19	10.76	75.0%	120	.850	.197	-.05/.50	.752	.18/.98
04A	01/06–08/06	221	89.49	10.91	74.7%	119*	.852	.196	-.10/.44	.752	.17/.98
04B	01/06–08/06	191	91.20	10.12	75.9%	120	.830	.180	-.09/.48	.760	.18/.99
05A	09/06–05/08	1008	90.68	10.25	74.9%	120	.832	.180	-.07/.41	.756	.22/.98
05B	09/06–05/08	819	90.89	9.71	78.0%	120	.816	.170	-.11/.41	.757	.21/.99
09A	10/08–11/09	467	92.85	10.46	80.7%	120	.850	.195	-.06/.45	.770	.08/.99
09B	10/08–11/09	435	92.03	11.31	79.3%	120	.870	.215	-.02/.44	.770	.08/.98

A number of the recommendations of this project report were derived from the lessons learned in importing the questions and test-taker responses. These recommendations will assist in maintenance for statistical-psychometric analyses that should be conducted annually and used to improve and grow the question bank. For example, CETE believes strongly that the single True-False question is not effective (due to the susceptibility to guessing by a test-taker who does not have the technical knowledge) but there was considerable reluctance to drop all such questions in November and again in February. What is recommended is over time to eliminate this question format slowly. Likewise, questions that are too easy can be eliminated over time, perhaps by first addressing questions with difficulty levels above 90% during one examination cycle, and then moving to revise or eliminate those with difficulty levels between 80-89% in subsequent cycles.

A second recommendation is to estimate the reliability for topic areas (in addition to the overall score using all questions). This topic area reliability is important given the reporting practice and variable numbers of questions (from 6-28 for Examination 09: Overall Context 8Q, Floodplain Mapping 31Q, NFIP Standards 29Q, Reg Standards 28Q, Flood Insurance 12Q, Mitigation 6Q, Natural-Beneficial Functions 6Q). Current score reporting consists of the number correct for each of the topic areas provided to passing and to failing candidates. This current ASFPM practice may be providing feedback to failing candidates based on less-than-reliable scores for the smaller sections, specifically Overall Context, Mitigation, and Natural-Beneficial Functions (the issue has been mitigated in proposed examination specification for the Mitigation and Natural-Beneficial Functions sections).

NCCA Standard 15

This standard with two essential elements cannot be met at this time. Development of a question bank that can support two or more forms, together with evidence of equating forms on difficulty and documentation of good psychometric practices Standard 17), is required for full compliance.

This standard is not met because there are not two forms of the examination in the psychometric sense, just two re-ordered versions of the same question set. Although as reported above the two re-arranged sets of questions (09A, 09B) were not statistically different, two distinct forms (for example with 80 unique questions and 40 common questions) should be developed after increasing the size of the question bank. When the question bank size supports this requirement, a formal equating study should be completed and archived in order to meet this standard in terms of psychometric practice and documentation. Note that the translation equivalence element is not relevant because the examination is offered only in English.

NCCA Standard 16

This standard with a single essential element is met.

The standard is met because the single essential element here concerns secure administration of the examination, which is under the control of ASFPM. As policies and procedures appear to be in place, publication according to the definition provided in the SeaCrest report will enhance compliance.

Additional specific recommendations for ASFPM consideration

--CETE recommends that ASFPM consider technology, including video monitoring as a strategic tactic and computer-based testing as a strategic goal to control test security (because of reduced likelihood of examination leakage).

--CETE recommends that question exposure be tracked in the question database by noting for each question when and where in the examination it has been used.

NCCA Standard 17

This standard with a single essential element is not met, but most of the compliance components can be put into place with minimal effort.

The standard is not met, but the essential element here pertains to storage of examination development materials and access to them. When the secure products are stored and access controls are developed for the database and products, the standard will be met.

NCCA Standard 18

This standard with a single essential element is partially met; publication should be put into place.

This standard is partially met, as the certifying body ASFPM stores all examinations ever given at headquarters but does not have a published records retention interval or access controls. Determination and publication of an appropriate interval is all that remains to secure compliance.

Additional Recommendations:

--CETE suggests that it is possible to digitize and store administered examinations through scanning to provide greater capacity and access control.

SECTION 4) Summary: Overall Conclusions and Additional Recommendations

Backing away from the accreditation standards compliance approach to gain perspective, key themes across governance and assessment instrument recommendations pertain to the following:

SeaCrest recommendations covered areas of Governance, Policy-Procedure, and Information Published. The governance keys are as follows: G1) autonomy for CBOR and G2) addition of a public member.

Assessment Instrument key themes are as follows: A1) two or more equivalent forms of the CFM® examination, A2) question bank from which specific forms are constructed for each testing cycle, A3) greater involvement of the ASFPM membership in examination development and validation, and A4) attention to publication of reports to stakeholders with information about examination development, maintenance, and test-taker scores.

Each of these keys is addressed briefly below as they are recommended priorities from the perspective of the contractor staff.

G1) Governance relationships between ASFPM and CBOR should be clarified, transparent, and free of any appearance that CBOR is unduly influenced by ASFPM concerning management of the CFM® program. The SeaCrest report provides tactics to accomplish this strategy, but implementation will depend on willingness and trust between the parties.

G2) Public members serve important roles in associations and certifications. They should act as a sounding board and a reality check when technical and regulatory issues arise, in order to provide perspective. The SeaCrest report and its Attachment C discuss how to recruit and select a public member.

A1) Recommendations for multiple and equivalent forms are common in the certification world. The primary reasons are the need to preserve test security and to ensure due process if a certification candidate retakes an examination (Downing & Haladyna, 2006; Knapp, Anderson, & Wild, 2009). Equivalence refers to the comparative difficulty of the two forms and means that it should not matter which form a certification candidate receives at a test session (the scores would be roughly equal). Note that this recommendation for two forms is sensitive to the time required 1) to inform the association membership and 2) to expand the pool of questions. Further, recommending two forms does NOT imply that all questions are different between forms because a common set of questions that appears on both forms is required for statistically equating the difficulty. For instance, given the current 120 question form length used for the CFM® examination, a two-form configuration might consist of 40 common and 80 unique questions. Such a configuration would require a bank of 200 questions (80 + 80 + 40) rather than 240 questions (120 + 120). The issue of establishing form equivalence means that additional psychometric expertise will be required for ASFPM going forward.

A2) Question bank is a generic term for the repository of questions and other items that could potentially be used for a specific examination form. The bank is usually stored in a relational database (ASFPM currently uses MySQL). Rows in this database refer to specific questions and should have a unique identification number for tracking purposes. Question information includes parts of the question: the stem of the question, the response alternatives (options), the correct alternative (key), and any associated material (FEMA Elevation Certificates, maps, or narrative scenarios that pertain to multiple questions). One advantage of using a relational database to hold the bank is that it allows the user to define additional fields (columns) that “tag” information related to each specific question. Among the fields that can be added are a) revision history (currently tracked via paper

documents), b) when and where used (year and form to track question “exposure”), c) question psychometric characteristics such as difficulty or discrimination, and d) any challenges to the question-item by individual test-takers. Careful maintenance of the database is important for quality and defensibility of the certification program. As well as customized generic databases (Access, SQL, MySQL), there are a number of commercial products for question test banks, certification candidate information, and management systems. Prominent vendors include ZAPCertify, Integral7, Alpine Testing Systems, and others. CETE recommends that ASFPM consider the first two as representing best-in-class vendors and make a decision between them based on pricing and features.

A3) The current CFM® program relies on a small set of individuals who work to create and review questions, create the examination forms, and generally administer the system. CETE staff members recommend that the annual question analysis and test bank maintenance become institutionalized, public (yet secure), and transparent. This recommendation is intended to allow the process to be accessed by a larger set of ASFPM members who will provide input from the field. A part of this process is to have clear assignments and terms for service for the various roles. Staggering and rotating membership in the group responsible for the examination is one method for accomplishing this suggestion. Succession planning is the term in business for ensuring a supply of individuals who are ready to assume responsibility in case of disaster – the project team is not predicting disaster but methods to ensure continuity.

A4) Publication of annual-cyclic or periodic reports is intended to provide information to stakeholders, thus this overall point spans several accreditation standards (Standard 7, various elements of Standards 10-18). Such reports can be a valuable communication tool if planned and executed properly. Models are available at large certification agencies and can be found through web searches. The PDC annual report is one way in which many of these elements could be included (summary of examination results, average scores, and psychometric statistics for reliability of the total score and by topic areas).

Additional Specific Recommendations

1. Examination Purpose is a fundamental consideration in developing and validating a certification examination, as illustrated by Schoon and Smith (2000) in their book *The mission of certification*. Although the SeaCrest report indicated that the purpose of the CFM® program is stated in the charter, is recommended that CBOR-ASFPM create an examination purpose statement for the CFM® program and post this on the website.

Test purpose should include a global description of why test, who tests, and how they are tested. Further details provided in the test purpose statement might include answers to the following questions: What are the stakes of the examination in terms of consequences to the test-taker? What claims or warranties does ASFPM want to make and support concerning individual holders of the CFM® designation (those who pass)? Should the claim or warranty be knowledge-based or skill-based? Should the claim be related to the overall practice of the occupation-profession or to a specific job in an organization?

Another purpose issue that may arise is the use of the certification in hiring, which could have a rebound effect against ASFPM if an individual claims employment discrimination. One way to handle this issue is to specify the legal limits of the certification from the ASFPM perspective in the examination or certification purpose statement (this strategy is used in a brochure for the Automotive Service Excellence certification issued by the National Automotive Technical Education Foundation). The test purpose statement forms the basis of a technical report to support accreditation and guides the documentation and validation process.

CETE recommends that ASFPM draft and circulate a test purpose statement which when finalized could be posted on the website in a transparent manner and used as a mission statement in the technical report summarizing the CFM® examination.

2. Individual questions (which may include questions), stored in a database and assembled into test forms, are the vehicle used to evaluate certification candidates to support a decision to certify as a CFM®. Current questions on the two test series, which consist of identical but reordered questions, represent a blend of True-False, Multiple Choice, and Map or Elevation Certificate interpretation questions (using a fill-in or a multiple choice). Several recommendations were presented above and others are presented below using the results of the question analysis and test form (series) comparison as well as a review of practices and research-based guidance (Haladyna, 2004). Recall that the two statistics derived from the analyses were the number of test-takers who responded correctly and the question-total score correlation (how responding on the question, correct or not correct, relates to the total score on the test form (series)). Difficulty and discrimination are the respective summary terms for these two question characteristics.

It is recommended that ASFPM establish a secure database with table structures for storage of questions, as noted above, and for test-taker responses. For analyzing specific test-taker responses, it is best to store the actual candidate responses for each question (A-D if all questions are 4-option), and then to apply a key for right-wrong scoring (0=incorrect, 1=correct). This recommendation will support maintenance that is already conducted by ASFPM, and will supply additional information with appropriate database queries/filters, reports, and forms (for question review and modification). Many requirements exist for such databases, but controlled access will be crucial to maintain the high quality and integrity of the CFM® program.

It is further recommended that the number of true-false questions be reduced to eliminate questions that have high guessing probabilities (.50). The question difficulty values from the psychometric analysis seem quite high, with many values above .80 (meaning that 80% or more of test-takers are answering the question correctly). The distribution of question difficulty values from the reliability analysis is skewed to the high end of the spectrum. Questions with very high or very low difficulty values are not contributing much information about candidate knowledge to the total score. Nor are items that have low discrimination (marked in Attachment J with red font if < .10 or negative).

It is also recommended that the number of options be standardized to three, four, or five. This is a standard recommendation for multiple choice format questions, and there is research to support using three options (Rodriguez, 2005). CETE suggests that, if three options are used, ASFPM drop the poorest performing option to go with the three best (one correct and two distracters) and make the test slightly longer (150 questions). A complementary action is to apply the correction for guessing found in psychometric textbooks [$\text{Score} = \text{Right Answers} - \text{Wrong Answers} / (K - 1)$ where K is the number of options for an item – in the case of three options K-1 would equal 2].

It is also recommended that questions be written using standard question writing guidelines such as those provided by CETE project staff (or others that are widely available).

It is also recommended that multiple choice options be scrutinized to reduce low-functioning options (those that are not chosen, or are chosen at very low levels, by test-takers). Storage of the exact response for each candidate to every question supports use of option data in the annual review process.

Question options, for example, should be dropped if they are not attracting test takers or revised to become more attractive to those who do not have the technical knowledge required for certification.

Third, various state program examinations are affiliated in different ways with ASFPM, but as noted in the SeaCrest report it is important to reconsider that relationship if applying for accreditation review. Individual states would be best served by replicating this process with their own membership or adopting the national test for state usage. Leverage, such as that provided by the reach and resources of ASFPM as a national organization, makes quality assurance easier for the CFM® program.

Finally, a final possibility offered for consideration by ASFPM is the emergence of competency models in competition with the traditional task models used in credentialing. There are a number of advantages of competencies over tasks, according to Sanchez and Levine (2009), including future orientation and maximum performance orientation for competencies compared to past orientation and typical performance for traditional task analysis.

Conclusions

Overall, the staff members from SeaCrest and the OSU Center on Education and Training for Employment who worked on this project were impressed with the dedication and progress made by ASFPM in creating the CFM® program. The compliance status and recommendations should in no way detract from the accomplishments of engaged ASFPM staff and CBOR members. These advisory recommendations will take time to interpret and implement, and it may be that not all of them are accepted. Too, several examination cycles will be required to implement the more important recommendations and achieve data results. One of the keys to making change is ensuring that this voluntary certification is public and transparent. This openness will assist ASFPM in raising member awareness of the CFM® and increasing their understanding of opportunities for participation in the credentialing process.

Several strategic considerations for ASFPM to consider include international certifications, computer-based testing, additional certifications, and timing for seeking NCCA accreditation. For the first case, given the occurrence of various forms of flooding and other hazards worldwide, international certifications seem logical. If so, additional considerations of language and accreditation (ISO/IEC 17024) become relevant. In the second case, computer- and internet-based testing offer quicker scoring and feedback to candidates, but create issues of cost, technology, and security. Formation of a taskforce to consider this issue is one way to approach it. Also, large testing vendors provide whitepapers on issues and transitions between paper-based and computer-based testing. In the third case, additional certifications to consider might be at the expert rather than entry level.

A final strategic consideration offered is timing, or when to seek accreditation from NCCA. The major limiting factor is a requirement for at least two equivalent forms of the examination, thus several testing cycles are expected before the required question bank size is obtained and systematic question analysis reviews occur. Conducting these annual reviews and documenting personnel and procedures will help to address NCCA Standard 17 and others (for example, Standard 7). The graphic organizer below shows how to approach the process for the Assessment Instrument standards, and similar logic could be applied to governance standards reviewed by SeaCrest.

Graphic Organizer for CETE Recommendations and Next Steps

	Years				
Std	2010-2011	2012	2013	2014	2015
10	Publish results of the DACUM practice analysis; determine other points	Annual update?		Annual update?	Re-do
11	Shift to Examination 10 using database for form selection; consider embedded pre-test for question tryout in live exams (do not use in scoring); conduct annual review of bank, add questions to bank	Shift to Examination 11 under same general guidance (TBD by ASFPM)			
12	Compute & use cut score developed at workshop (calculate from items chosen for Exam 10)	Continue use of			
13	Consider recommended changes in scoring, interpreting, & reporting	Continue implementation			
14	Conduct and publish reliability analysis (PDC report)				
15	Work to build question bank for two forms of CFM® examination	Continue building bank (see 11 above)	Evaluate two forms?	Evaluate two forms?	
16	Continue secure administration; determine how to evaluate exam compromise	Continue secure administration; evaluate exam compromise	Continue secure administration	Continue secure administration	
17	Publish details of this accreditation audit project, including DACUM and workshops with question bank.				
18	Develop / implement rationale for test-taker materials storage				

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CETE ATTACHMENTS (Continued from SeaCrest Attachment sequencing)

D. Project Workflow and Events

E. Alignment Data Collected at November 2009 Workshop (CFM® Examination Topics X DACUM Duties [7 X 7], CFM® Examination Topics X DACUM General Knowledge Areas [7 X 24], and DACUM Duties X General Knowledge Areas [7 X 24])

F. Test Blueprint Recommended (Exam Topics with Knowledge Areas) with Supporting Documentation

G. Membership for Alignment-Linkage-Writing Workshop (#2)

H. Membership for Question Review and Cutoff Score Determination Workshop (#3)

I. Item Writing Guidelines [Document shared October, 2009]

J. Examination 09 “Question” Analysis Data for Annual Maintenance (Template for annual review workshop)

K. Brief Summary of DACUM-Verification-Alignment Process to Delineate Floodplain Management Domain

L. DACUM Research Chart (as finalized August, 2009 by Members from Workshop #1; including Duties H & I)

M. Summary of DACUM Research Chart (used in online verification survey)

N. Recommendations for CFM® Examination Maintenance (Question Psychometric Analysis, Establishing Cut Score for Examination and Series)

D. Project Workflow and Events

Workflow Step or Event	Who?
RFP	ASFPM Issued
Proposal	CETE with SeaCrest Partner
Negotiations	All parties
Contract Finalized	ASFPM-OSU Research Foundation
Governance Audit	SeaCrest Partner
Draft Governance Audit Report Shared	SeaCrest Partner
Investigate Background of CFM® (Documents, Interviews)	CETE
Transfer ASFPM Database	CETE
Investigate-Confirm Structure	CETE
Extract Questions, Test-taker Responses to new database	CETE
Preliminary Psychometric Analysis of Questions (by Form)	CETE
Draft Psychometric Analysis Report Shared	CETE
Recruit DACUM Panel	ASFPM-CBOR
Prep-Conduct DACUM Workshop #1	CETE
Finalize DACUM Research Chart	ASFPM- DACUM Panel
Create-Review Verification Survey	CETE
Host-Monitor Online Survey	CETE
Analyze Survey Responses	CETE
Import Questions & Statistics into Application	CETE
Create Draft Test Blueprints	CETE
Prep-Conduct Workshop #2	CETE-Test Development Panel
Summarize-Plan Workshop #3	CETE
Prep-Conduct Workshop #3	CETE-Test Bank Finalization Panel
Prepare Final Report Summarizing Project	CETE-SeaCrest

E. Alignment Results (Judgments by SME Panel at November 2009 Test Development Workshop)

Alignment Background. In order to understand the occupational-practice domain and utilize the results of the online verification survey, Yes/No judgments of alignment between elements of the DACUM chart from the occupational practice analysis and the seven CFM® Examination Topics were collected. The DACUM chart included nine duties; seven were used for certification testing (based on a post-workshop review of the panel coordinated by ASFPM staff) and twenty-four knowledge areas. The various elements to be aligned are shown below in three separate tables, respectively DACUM Duties, CFM® Examination Topics, and DACUM Knowledge Areas. The sequence ID from each of the tables on this page is used in the alignment tables below to save space.

DACUM DUTIES	
Sequence	Duty Statement
A	Administer Floodplain Management Programs
B	Perform Hazard Identification & Risk Assessment
C	Perform Outreach Activities
D	Perform Customer Service Activities
E	Perform Mapping Activities
F	Perform Mitigation & Preparedness Activities
G	Perform Disaster Response & Recovery Activities

TRADITIONAL CFM® EXAMINATION TOPICS	
#	Topic Statement
01	Overall Context of Floodplain Management
02	Floodplain Mapping
03	NFIP Regulatory Standards
04	Regulatory and Non-Regulatory Administrative Procedures
05	Flood Insurance
06	Flood Hazard Mitigation
07	Natural and Beneficial Functions

DACUM KNOWLEDGE AREAS	
#	Knowledge Statement
01	<i>National Flood Insurance Program</i>
02	<i>Basic mathematics/statistics</i>
03	<i>Federal Emergency Management Agency (FEMA)/State contacts</i>
04	<i>44 Code of Federal Regulations</i>
05	<i>Coastal Barrier Resource Area (CBRA) zones</i>
06	<i>Geographic Information System</i>
07	<i>Permitting process</i>
08	<i>Building codes</i>
09	<i>Floodplain mapping</i>
10	<i>Construction techniques</i>
11	<i>Grant opportunities</i>
12	<i>Other agency or department regulations</i>
13	<i>Planning/zoning concepts</i>
14	<i>Incident Command Structure</i>
15	<i>Environmental regulations</i>
16	<i>Geomorphology</i>
17	<i>Global Positioning System</i>
18	<i>Mutual aid agreements</i>
19	<i>Development standards</i>
20	<i>Dam break & inundation</i>
21	<i>Natural-beneficial functions of floodplains</i>
22	<i>Hydrology/hydraulics concepts</i>
23	<i>Nonstructural/structural flood-proofing methodologies</i>
24	<i>Community/state/federal resources</i>

Alignment Summary: DACUM Knowledge Areas and Existing Examination Topics									
DACUM		Existing Examination Topics							
Knowledge	Importance (Verification)	Topic 1	Topic 2	Topic 3	Topic 4	Topic 5	Topic 6	Topic 7	Links
01	3.38	11	12	12	12	12	11	2	6
02	2.97		12						1
03	2.87	9							1
04	3.02			13	9				2
05 dropped	1.98			8					1
06	2.99		11						1
07	3.09			8	10				2
08	2.55			8	9				2
09	3.46	9	13						2
10	2.60			11					1
11	2.26						10		1
12	2.63	11			8				2
13	2.71	9		8			8	9	4
14	2.07								0
15	2.68	8						12	2
16	2.16	8						11	2
17	2.38		11						1
18 dropped	1.90								0
19	2.81			12	9				2
20	2.42	8					8		2
21	3.03	10						13	2
22	3.23		11						1
23	2.79	8		9	8		11		4
24	2.80	10					10		2
# Links		11	6	9	7		5	4	

Alignment Summary: DACUM Duties and Existing Examination Topics								
	Existing CFM® Exam Topic Areas							
DACUM	Topic 1	Topic 2	Topic 3	Topic 4	Topic 5	Topic 6	Topic 7	# Links
<i>DUTY A</i>	12	8	13	13	5	9	10	6
<i>DUTY B</i>	10	11	5	5	5	8	5	3
<i>DUTY C</i>	11	9	6	4	11	8	10	5
<i>DUTY D</i>	11	10	8	6	11	7	6	4
<i>DUTY E</i>	8	13	6	5	4	4	4	2
<i>DUTY F</i>	11	6	7	4	4	13	8	3
<i>DUTY G</i>	9	5	6	6	7	9	5	2
# Links	7	5	2	1	2	5	3	

Alignment Summary: DACUM Duties and General Knowledge								
	DACUM Duties							
KNOWLEDGE	A	B	C	D	E	F	G	# Links
01	13	9	13	11	10	10	10	7
02	4	6	2	1	8	3	4	1
03	13	4	9	9	3	8	9	5
04	13	6	8	9	7	8	11	5
05	13	8	7	5	6	2	3	2
06	4	8	3	2	11	4	7	2
07	13	2	10	13	2	5	8	4
08	11	2	6	9	0	8	9	4
09	13	11	10	9	11	6	9	6
10	12	5	7	9	2	11	10	4
11	7	2	8	6	2	9	10	3
12	11	5	8	9	1	7	9	4
13	11	5	8	6	6	9	5	3
14	4	2	3	2	1	5	13	1
15	12	3	6	7	2	8	5	2
16	7	8	0	0	7	3	2	1
17	4	6	2	2	9	2	7	1
18	4	1	1	1	1	5	13	1
19	13	3	9	10	5	6	8	3
20	6	9	6	3	4	7	8	1
21	11	7	7	7	6	6	5	2
22	7	11	4	3	13	3	5	2
23	12	5	8	9	0	13	10	5
24	12	6	9	9	5	10	13	5

F. Examination Specification (Test Blueprint) Question Allocations 2009 and 2010

ALLOCATION 2009	CFM® Examination Topics													
	Topic 1		Topic 2		Topic 3		Topic 4		Topic 5		Topic 6		Topic 7	
<i>Subject Matter Expert</i>	Low%	High%	Low%	High%	Low%	High%	Low%	High%	Low%	High%	Low%	High%	Low%	High%
Joe Remondini		15		20		28		10		12		10		5
Kait Laufenberg	10	20	20	30	10	20	10	15	10	15	15	20	5	10
Dorothy Martinez		15		20		20		20		10		10		5
Stephen Mitchell	5	10	20	25	25	35	25	35	5	10	5	10	10	15
Heidi Carlin		5		20		30		20		10		10		5
Jen Marcy	5	10	25	30	25	30	20	25	10	15	5	10	5	10
Mike Parker	10	25	25	30	25	30	10	25	10	20	10	20	5	10
John Ivey	3	5	25	30	20	25	20	25	5	10	10	15	3	5
Diane Calhoun	5	10	25	30	25	30	20	25	10	15	5	10	5	10
Chad Berginnis	10	15	15	20	15	20	15	20	10	15	20	25	10	15
Cindy Crecelius	5	10	20	25	25	30	20	25	5	10	5	10	10	15
Rhonda Montgomery	0	5	15	20	15	25	10	25	10	15	10	15		10
Warren Campbell		2		33		20		20		10		10		5
<i>Average</i>	<i>5.89</i>	<i>11.31</i>	<i>21.11</i>	<i>25.61</i>	<i>20.56</i>	<i>26.38</i>	<i>16.67</i>	<i>22.31</i>	<i>8.33</i>	<i>12.85</i>	<i>9.44</i>	<i>13.46</i>	<i>6.62</i>	<i>9.23</i>

ALLOCATION 2010	CFM® Examination Topics																				
	Topic 1			Topic 2			Topic 3			Topic 4			Topic 5			Topic 6			Topic 7		
<i>Subject Matter Expert</i>	<i>Rank</i>	<i>Low</i>	<i>High</i>	<i>Rank</i>	<i>Low</i>	<i>High</i>	<i>Rank</i>	<i>Low</i>	<i>High</i>	<i>Rank</i>	<i>Low</i>	<i>High</i>	<i>Rank</i>	<i>Low</i>	<i>High</i>	<i>Rank</i>	<i>Low</i>	<i>High</i>	<i>Rank</i>	<i>Low</i>	<i>High</i>
Kait Laufenberg	4	5	10	2	20	25	1	15	25	3	15	25	5	5	15	6	5	15	7	0	15
Diane Calhoun	2	3	10	5	15	25	1	15	25	4	10	20	6	5	15	7	5	15	3	5	15
John Ivey	4	3	10	2	20	30	1	20	30	3	20	30	7	3	10	6	5	15	5	5	15
Michael Parker	4	10	15	2	20	25	1	20	25	3	15	20	6	15	20	5	10	15	7	10	15
Heidi Carlin	2	10	20	4	35	45	3	30	40	1	20	40	5	10	20	7	5	10	6	5	10
Rhonda Montgomery	4	15	20	3	15	20	1	15	20	2	20	25	5	5	10	7	5	5	6	5	5
Cindy Crecelius	7	5	10	2	15	25	1	20	25	3	15	20	4	15	20	5	10	15	6	10	15
<i>Average</i>	<i>3.86</i>	<i>7.29</i>	<i>13.57</i>	<i>2.86</i>	<i>20.00</i>	<i>27.86</i>	<i>1.29</i>	<i>19.29</i>	<i>27.14</i>	<i>2.71</i>	<i>16.43</i>	<i>25.71</i>	<i>5.43</i>	<i>8.29</i>	<i>15.71</i>	<i>6.14</i>	<i>6.43</i>	<i>12.86</i>	<i>5.71</i>	<i>5.71</i>	<i>12.86</i>

Consensus Blueprint Following Panel Discussion During Workshop #2 (11-02-09)				
Topic	% Q	Min #	Max #	Exam 09
Overall Context of Floodplain Management (1)	05-10%	6	12	8
Floodplain Mapping (2)	20-25%	24	30	31
NFIP Regulatory Standards (3)	20-25%	24	30	29
Regulatory & Non-Regulatory Administrative Procedures (4)	15-20%	18	24	28
Flood Insurance (5)	10-15%	12	18	12
Flood Hazard Mitigation and Other Hazards (6)	10-15%	12	18	6
Natural and Beneficial Functions (7)	10-15%	12	18	6

% Q is based on 120 question examination, but the logic can be applied to any total number desired

SUMMARY: DACUM Duties (with linkage proportions) Aligned to Examination Topics and DACUM Knowledge Statements

Examination Specification with Alignment to DACUM Duties								
Topic (DACUM Knowledge Below)		Duties (Linkage proportions)						
	% Q	A	B	C	D	E	F	G
Overall Context: Floodplain Management (1)	05-10	0.92	0.77	0.85	0.85	0.62	0.85	0.69
<i>National Flood Insurance Program (01)</i>		1.00	0.69	1.00	0.85	0.77	0.77	0.77
<i>FEMA / State contacts (03)</i>		1.00		0.69	0.69		0.62	0.69
<i>Floodplain mapping (09)</i>		1.00	0.85	0.77	0.69	0.85		0.69
<i>Other agency or department regulations (12)</i>		0.85		0.62	0.69			0.69
<i>Planning / zoning concepts (13)</i>		0.85		0.62			0.69	
<i>Environmental regulations (15)</i>		0.85					0.62	
<i>Geomorphology (16)</i>			0.62					
<i>Dam break & inundation (20)</i>			0.69					0.62
<i>Natural-beneficial functions of floodplains (21)</i>		0.85						
<i>Nonstructural / structural floodproofing methodologies (23)</i>		0.92		0.62	0.69		1.00	0.85
<i>Community/state/federal resources (24)</i>		0.92		0.69	0.69		0.85	1.00
Floodplain Mapping (2)	20-25	0.62	0.85	0.69	0.77	1.00		
<i>National Flood Insurance Program (01)</i>		1.00	0.69	1.00	0.85	0.77		
<i>Basic mathematics / statistics (02)</i>						0.62		
<i>Geographic Information System (06)</i>			0.62			0.85		
<i>Floodplain mapping (09)</i>		1.00	0.85	0.77	0.69	0.85		
<i>Global Positioning System (17)</i>						0.69		
<i>Hydrology / hydraulics concepts (22)</i>			0.85			1.00		
NFIP Regulatory Standards (3)	20-25	1.00			0.62			
<i>National Flood Insurance Program (01)</i>		1.00			0.85			
<i>44 Code of Federal Regulations (04)</i>		1.00			0.69			
<i>Coastal Barrier Resource Area zones (05)</i>		1.00						
<i>Permitting process (07)</i>		1.00			1.00			
<i>Building codes (08)</i>		0.85			0.69			
<i>Construction techniques (10)</i>		0.92			0.69			
<i>Planning / zoning concepts (13)</i>		0.85						
<i>Development standards (19)</i>		1.00			0.77			
<i>Nonstructural / structural floodproofing methodologies (23)</i>		0.92			0.69			
Regulatory / Non-Reg Admin Procedures (4)	15-20	1.00						

<i>National Flood Insurance Program (01)</i>		1.00						
<i>44 Code of Federal Regulations (04)</i>		1.00						
<i>Permitting process (07)</i>		1.00						
<i>Building codes (08)</i>		0.85						
<i>Other agency or department regulations (12)</i>		0.85						
<i>Development standards (19)</i>		1.00						
<i>Nonstructural / structural flood-proofing methodologies (23)</i>		0.92						
Flood Insurance (5)	10-15			0.85	0.85			
<i>National Flood Insurance Program (01)</i>				1.00	0.85			
Flood Hazard Mitigation / Other Hazards (6)	10-15	0.69	0.62	0.62			1.00	0.69
<i>National Flood Insurance Program (01)</i>		1.00					0.77	0.77
<i>Grant opportunities (11)</i>				0.62			0.69	0.77
<i>Planning / zoning concepts (13)</i>		0.85		0.62			0.69	
<i>Dam break & inundation (20)</i>			0.85					
<i>Nonstructural / structural flood-proofing methodologies (23)</i>		0.92		0.62			1.00	0.77
<i>Community / state / federal resources (24)</i>		0.92		0.69			0.77	1.00
Natural and Beneficial Functions (7)	10-15	0.77		0.77			0.69	
<i>Planning / zoning concepts (13)</i>		0.85		0.62			0.69	
<i>Environmental regulations (15)</i>		0.92						
<i>Geomorphology (16)</i>								
<i>Natural-beneficial functions of floodplains (21)</i>		0.85						

* NOTE. This display could be elaborated for question writing by using prioritized tasks under to the aligned duties, for either Exam Topics or Knowledge Areas.

G. Panel Members for Alignment-Linkage-Writing (Workshop #2)

Panel Member Name	DACUM Workshop #1	Question Review & Cut Score #3
Chad Berginnis		
Dianne Calhoun		Panel Member
Heidi Carlin		Panel Member
Cindy Crecelius		Panel Member
Warren Campbell		
John Ivey		Panel Member
Kait Laufenberg	Observer	Panel Member
Jen Marcy		
Dorothy Martinez		
Stephen Mitchell	Panel Member	
Rhonda Montgomery	Panel Member	Panel Member
Mike Parker		Panel Member
Joseph Remondini	Panel Member	

H. Panel Members for Question Review (Content Validation) and Cutoff Score Determination (Workshop #3)

Dianne Calhoun	CBOR President
Heidi Carlin	CBOR Member
Cindy Crecelius	CBOR Member
John Ivey	PDC, CBOR Member
Kait Laufenberg	ASFPM Staff
Rhonda Montgomery	FEMA, CBOR Member
Mike Parker	CBOR Member

NOTE: Qualifications for individuals are found in the database table for Subject Matter Experts

I. Sample "Question Analysis" Tables to Illustrate Test Maintenance Input (Exam 09, Series A & B)
 [Mean = Question Difficulty; item-Total Correl = Question Discrimination]

CFM09A (467 Test-takers)				
	Mean*	Std Dev	item-Total Correl*	Alpha if Deleted
Q001	.71	.455	.201	.849
Q002	.88	.325	.293	.848
Q003	.96	.198	-.026	.851
Q004	.86	.349	.140	.850
Q005	.55	.498	.169	.849
Q006	.94	.242	.136	.850
Q007	.85	.357	.183	.849
Q008	.96	.207	.155	.849
Q009	.94	.242	.159	.849
Q010	.99	.092	.110	.850
Q011	.85	.355	-.034	.851
Q012	.80	.398	.002	.851
Q013	.97	.158	.134	.850
Q014	.93	.264	.086	.850
Q015	.72	.448	.220	.849
Q016	.90	.304	.222	.849
Q017	.97	.158	-.060	.851
Q018	.66	.474	.148	.850
Q019	.93	.249	.021	.850
Q020	.83	.373	.286	.848
Q021	.90	.301	.049	.850
Q022	.80	.400	.231	.849
Q023	.52	.500	.099	.851
Q024	.77	.419	.275	.848
Q025	.89	.315	.046	.850
Q026	.86	.347	.157	.849
Q027	.52	.500	.270	.848
Q028	.69	.465	.221	.849
Q029	.60	.491	.077	.851

CFM09A (467 Test-takers)				
	Mean*	Std Dev	item-Total Correl*	Alpha if Deleted
Q030	.85	.359	.068	.850
Q031	.54	.499	.219	.849
Q032	.68	.468	.218	.849
Q033	.44	.497	.131	.850
Q034	.93	.257	.296	.848
Q035	.89	.310	.183	.849
Q036	.87	.337	.413	.847
Q037	.87	.342	.298	.848
Q038	.81	.390	.186	.849
Q039	.94	.245	.268	.849
Q040	.84	.368	.126	.850
Q041	.54	.499	.126	.850
Q042	.67	.472	.345	.847
Q043	.92	.267	.138	.850
Q044	.38	.487	.282	.848
Q045	.93	.253	.176	.849
Q046	.78	.412	.255	.848
Q047	.92	.270	.195	.849
Q048	.90	.307	.129	.850
Q049	.86	.351	-.063	.852
Q050	.95	.212	.080	.850
Q051	.91	.283	.155	.849
Q052	.62	.485	.328	.847
Q053	.78	.415	.186	.849
Q054	.95	.212	.106	.850
Q055	.76	.427	.176	.849
Q056	.90	.301	.238	.849
Q057	.91	.280	.239	.849
Q058	.93	.260	.282	.848
Q059	.99	.113	.175	.850
Q060	.58	.494	.215	.849

CFM09A (467 Test-takers)				
	Mean*	Std Dev	item-Total Correl*	Alpha if Deleted
Q061	.83	.375	.096	.850
Q062	.95	.212	.158	.849
Q063	.89	.310	.097	.850
Q064	.88	.323	.244	.848
Q065	.79	.406	.396	.846
Q066	.72	.452	.112	.850
Q067	.07	.253	.076	.850
Q068	.48	.500	.044	.851
Q069	.45	.498	.127	.850
Q070	.84	.368	.273	.848
Q071	.61	.489	.243	.848
Q072	.57	.496	.362	.847
Q073	.21	.405	.321	.847
Q074	.64	.482	.331	.847
Q075	.26	.439	.199	.849
Q076	.35	.479	.154	.850
Q077	.94	.234	.248	.849
Q078	.92	.274	.186	.849
Q079	.96	.207	.273	.849
Q080	.94	.242	.268	.849
Q081	.73	.444	.298	.848
Q082	.59	.493	.234	.848
Q083	.58	.493	.205	.849
Q084	.65	.476	.211	.849
Q085	.88	.323	.011	.851
Q086	.82	.383	.308	.848
Q087	.88	.320	.248	.848
Q088	.86	.349	.165	.849
Q089	.74	.440	.291	.848
Q090	.94	.238	.186	.849
Q091	.63	.484	.172	.849

CFM09A (467 Test-takers)				
	Mean*	Std Dev	item-Total Correl*	Alpha if Deleted
Q092	.92	.270	.045	.850
Q093	.50	.501	.268	.848
Q094	.76	.430	.327	.847
Q095	.88	.328	.113	.850
Q096	.77	.421	.205	.849
Q097	.66	.475	.275	.848
Q098	.99	.122	.167	.850
Q099	.95	.217	.114	.850
Q100	.69	.465	.355	.847
Q101	.58	.493	.360	.847
Q102	.85	.362	.258	.848
Q103	.58	.494	.323	.847
Q104	.93	.257	.188	.849
Q105	.68	.466	.157	.850
Q106	.59	.492	.292	.848
Q107	.82	.384	.290	.848
Q108	.84	.370	.321	.848
Q109	.85	.355	.165	.849
Q110	.72	.452	.278	.848
Q111	.95	.212	.149	.849
Q112	.61	.489	.181	.849
Q113	.60	.491	.318	.847
Q114	.91	.292	.145	.849
Q115	.90	.304	.098	.850
Q116	.74	.440	.417	.846
Q117	.89	.310	.203	.849
Q118	.90	.304	.450	.847
Q119	.86	.347	.336	.847
Q120	.78	.418	-.069	.852

CFM09B (435 Test-takers)				
	Mean*	Std Dev	item-Total Correl*	Alpha if Deleted
Q001	.83	.372	-.018	.872
Q002	.78	.417	.031	.871
Q003	.97	.157	.182	.870
Q004	.93	.258	.144	.870
Q005	.70	.460	.304	.868
Q006	.85	.355	.072	.871
Q007	.49	.501	.154	.870
Q008	.73	.444	.264	.869
Q009	.58	.494	.112	.871
Q010	.87	.340	.063	.871
Q011	.89	.319	.093	.870
Q012	.80	.399	.150	.870
Q013	.51	.501	.174	.870
Q014	.75	.435	.263	.869
Q015	.83	.380	.145	.870
Q016	.95	.224	.103	.870
Q017	.86	.343	.099	.870
Q018	.95	.215	.103	.870
Q019	.90	.305	.165	.870
Q020	.98	.150	.171	.870
Q021	.77	.420	.291	.869
Q022	.83	.372	.329	.868
Q023	.95	.215	.065	.870
Q024	.86	.352	.102	.870
Q025	.54	.499	.198	.870
Q026	.87	.338	.225	.869
Q027	.98	.143	.101	.870
Q028	.58	.495	.190	.870
Q029	.93	.250	.090	.870
Q030	.83	.374	.353	.868

CFM09B (435 Test-takers)				
	Mean*	Std Dev	item-Total Correl*	Alpha if Deleted
Q031	.54	.499	.185	.870
Q032	.70	.460	.404	.867
Q033	.92	.276	.138	.870
Q034	.42	.493	.342	.868
Q035	.92	.272	.237	.869
Q036	.77	.421	.171	.870
Q037	.92	.272	.184	.870
Q038	.94	.246	.303	.869
Q039	.98	.126	.050	.870
Q040	.61	.488	.130	.871
Q041	.80	.400	.081	.871
Q042	.68	.468	.320	.868
Q043	.51	.501	.112	.871
Q044	.92	.265	.217	.870
Q045	.90	.305	.308	.869
Q046	.82	.382	.378	.868
Q047	.08	.276	.174	.870
Q048	.47	.499	.099	.871
Q049	.39	.488	.092	.871
Q050	.78	.414	.361	.868
Q051	.58	.494	.326	.868
Q052	.43	.496	.168	.870
Q053	.83	.380	.143	.870
Q054	.92	.265	.123	.870
Q055	.73	.445	.191	.870
Q056	.91	.283	.220	.869
Q057	.90	.299	.259	.869
Q058	.90	.302	.083	.870
Q059	.81	.390	.130	.870
Q060	.95	.210	.246	.869

CFM09B (435 Test-takers)				
	Mean*	Std Dev	item-Total Correl*	Alpha if Deleted
Q061	.89	.308	.122	.870
Q062	.68	.469	.329	.868
Q063	.23	.421	.324	.868
Q064	.64	.481	.329	.868
Q065	.26	.442	.293	.869
Q066	.36	.481	.383	.867
Q067	.85	.359	.278	.869
Q068	.83	.378	.259	.869
Q069	.93	.254	.226	.869
Q070	.87	.335	.105	.870
Q071	.59	.492	.127	.871
Q072	.95	.210	.173	.870
Q073	.91	.289	.224	.869
Q074	.85	.359	.267	.869
Q075	.74	.440	.431	.867
Q076	.74	.436	.108	.871
Q077	.93	.261	.311	.869
Q078	.94	.237	.183	.870
Q079	.96	.194	.218	.870
Q080	.92	.269	.259	.869
Q081	.69	.462	.299	.869
Q082	.92	.276	.104	.870
Q083	.49	.500	.342	.868
Q084	.78	.415	.297	.869
Q085	.88	.330	.179	.870
Q086	.77	.421	.282	.869
Q087	.83	.374	.295	.869
Q088	.81	.390	.074	.871
Q089	.74	.442	.161	.870
Q090	.94	.233	.140	.870

CFM09B (435 Test-takers)				
	Mean*	Std Dev	item-Total Correl*	Alpha if Deleted
Q091	.60	.490	.255	.869
Q092	.58	.494	.282	.869
Q093	.58	.494	.322	.868
Q094	.68	.467	.271	.869
Q095	.89	.314	.056	.871
Q096	.82	.382	.238	.869
Q097	.63	.483	.268	.869
Q098	.92	.272	.175	.870
Q099	.97	.164	.240	.870
Q100	.67	.472	.364	.868
Q101	.88	.325	.178	.870
Q102	.66	.476	.298	.869
Q103	.60	.490	.353	.868
Q104	.91	.283	.304	.869
Q105	.67	.470	.208	.870
Q106	.61	.487	.298	.869
Q107	.83	.376	.342	.868
Q108	.83	.378	.358	.868
Q109	.87	.340	.296	.869
Q110	.74	.440	.227	.869
Q111	.54	.499	.199	.870
Q112	.63	.483	.295	.869
Q113	.96	.199	.185	.870
Q114	.94	.246	.306	.869
Q115	.74	.442	.410	.867
Q116	.91	.279	.125	.870
Q117	.94	.242	.220	.870
Q118	.87	.335	.417	.868
Q119	.86	.345	.330	.868
Q120	.80	.404	.008	.871

K. Brief Summary of DACUM-Verification-Alignment Process to Delineate Floodplain Management Body of Knowledge and Practice

Associations contribute to the greater good by outlining and certifying a body of knowledge, particularly in floodplain management. Demonstrated mastery of a body of knowledge in practice is what differentiates holders of a credential. Credentialing examinations must be based on analysis of the practice of the profession or the occupation, usually as an intersection of work tasks and sets of knowledge-skill. This brief summary indicates how a formal practice analysis for Floodplain Management was conducted, then verified through an online survey and used with judgments of alignment to modify an existing examination specification (test blueprint). The importance of linking the examination specification back to the practice analysis is that it allocates questions to an examination form which should be representative of essential and important knowledge and skill requirements. The examination specification also gives an aiming point when linking existing questions to the body of knowledge for Floodplain Management.

The practice analysis began with a DACUM (Developing A CurriculUM) workshop conducted in July 2009 at the Center on Education and Training for Employment of The Ohio State University. The DACUM process is facilitated work by a panel of 7-12 expert workers from the profession or occupation that identifies through recall and discussion broad duties and subordinate, specific tasks as well as General Knowledge and Skills, Future Trends and Concerns, Tools and Equipment, and Abbreviations / Acronyms. ASFPM staff selected 11 knowledgeable individuals holding the CFM® to participate (their names are provided in a table of Subject Matter Experts contained in the project database) and included an observer. Mr. John Moser and Mr. Michael Wonacott of CETE conducted the two-day workshop, with Moser as facilitator and Wonacott as recorder. The DACUM process resulted in an initial research chart of nine duties (A-I). ASFPM coordinated a review of the initial chart and the chart was finalized in early August as input to the online verification survey. A number of decisions made at this point included omitting several knowledge areas and Duties H-I from testing.

A verification survey aims to get additional input on the task and knowledge-skill domain identified by the DACUM panel. Best practice is for a large, representative sample to make structured judgments about the domain elements. An online survey was created by CETE and ASFPM staff and posted for association members to provide information about their backgrounds, to rate 108 tasks on “Importance” and “Frequency”, and to rate 37 knowledge or skills on “Extent of Training Required” and “Importance”. The survey was active from August 26 to September 18 2009. A total of 2187 individuals began the survey (out of 5000+ ASFPM members). Because of reminders and incentives there were a large number of complete responses (ranging from 1572-1582 of 2187, which is a 71.8% completion rate, and an overall response rate of approximately 25% of the ASFPM total membership). Analysis of the verification survey created a number of products, including a snapshot of self-reported annual salaries across the nation and a verified domain of knowledge and practice. The verified Duty-Task domain includes judgments averaged across survey respondents for “Importance” and “Frequency” for each task statement, direct rankings of Duty importance, and judgments of the completeness of the set of tasks; the corresponding Knowledge-Skill domain includes judgments averaged across respondents of “Extent of Training Required” and “Importance” as well as overall ratings of the Knowledge-Skill domain. Alignment judgments were not requested from verification survey respondents because the survey was already lengthy.

Linkages provide the most detailed picture of relationships among parts of the body of knowledge-practice (tasks, knowledge-skills, and examination topics). The purpose of alignment is to examine the need for an element with respect to each and every other element. Three alignment judgment tasks were completed at the start of Workshop #2: (1) each DACUM Duty (seven) with each ASFPM Examination Topic (seven), (2) each DACUM Duty (seven) with each DACUM Knowledge (twenty-four), and (3) each ASFPM Examination Topic (seven) with each DACUM Knowledge (twenty-four). Linkage summaries are provided in Attachment E. The requirement to establish a linkage was that eight of thirteen (8/13 or .62) subject matter experts had to indicate Yes for the link.

L. Input to Online Verification Survey (excluding Duties H and I): Tasks and Knowledge-Skill Statements

Verification Survey Task Statements
Review local, state, and federal development regulations (A01)
Conduct pre-development meetings (e.g., developers, design professionals, stakeholders) (A02)
Process floodplain development permits (A03)
Review Elevation Certificates (ECs) (A04)
Conduct code compliance inspections (A05)
Participate in Community Assistance Visits (CAVs) and Community Assistance Contacts (CACs) (A06)
Conduct site inspections (e.g., pre/post development, compliance) (A07)
Maintain permit files and documents (e.g., repetitive loss, Elevation Certificates [ECs], Letters of Map Change [LOMCs]) (A08)
Review variance requests (A09)
Develop floodplain ordinances (A10)
Maintain floodplain ordinances (e.g., model, local, state) (A11)
Interpret floodplain ordinances (A12)
Implement higher regulatory standards (e.g., No Adverse Impact [NAI], Community Rating System [CRS], Low Impact Development [LID]) (A13)
Develop policy/position papers, business plans (e.g., 5-year, short and long term) (A14)
Address floodplain ordinance violations (e.g., legal actions, stop work orders, Section 1316 Declaration [1316]) (A15)
Complete Federal Emergency Management Agency (FEMA) Biennial Reports (A16)
Participate in community meetings (A17)
Coordinate floodplain activities with other agencies (e.g., federal, state, nonprofit) (A18)
Provide technical expertise to policy makers (A19)
Update floodplain management executive orders (A20)
Reconcile conflicting guidance (A21)
Advocate for floodplain-related legislation (A22)
Develop funding mechanisms (e.g., storm water utilities, grants, special funding) (A23)
Populate program databases (e.g., Community Information System [CIS], Mapping Information Platform [MIP]) (A24)
Mentor new floodplain managers (A25)
Document flood events (B01)
Collect localized data (e.g., rainfall, streamgauge data, historical flooding information) (B02)
Evaluate levee certifications (B03)
Identify at-risk properties behind levees (B04)

Develop levee breach maps (B05)
Develop levee protection zone maps (B06)
Evaluate dam and levee safety (B07)
Develop watershed master plans (B08)
Develop storm water management plans (B09)
Develop master drainage plans (B10)
Conduct risk modeling (e.g., HAZards United States [HAZUS], Flood Impact Assessment [FIA], Flood Damage Assessment [FDA]) (B11)
Communicate loss estimation models to decision makers (B12)
Assist with implementing hazard mitigation plans (B13)
Coordinate watershed development across jurisdictional lines (B14)
Identify Repetitive Loss (RL) and Severe Repetitive Loss (SRL) areas (B15)
Identify unique flooding risks (e.g., ice jams, alluvial fans, tsunamis) (B16)
Promote placement and retention of stream and tidal gages (B17)
Identify placement location for warning signs (B18)
Promote higher development standards (e.g., No Adverse Impact [NAI], freeboard, Community Rating System [CRS]) (C01)
Promote Best Management Practices (BMPs) for Low Impact Development (LID) and green infrastructure (C02)
Participate in community events (e.g., Earth Day, Rotary, open house) (C03)
Promote flood awareness week/month (C04)
Prepare media press releases (C05)
Participate in media interviews (C06)
Publish outreach brochures and handouts (C07)
Distribute outreach brochures and handouts (C08)
Assist with website development (C09)
Develop outreach partnerships with other agencies or departments (e.g., National Oceanic and Atmospheric Administration [NOAA], utility mailouts, watershed councils) (C10)
Provide training to other professional groups (e.g., engineers, surveyors, realtors) (C11)
Organize state and regional conferences (C12)
Conduct training workshops and seminars (C13)
Publish floodplain management newsletters (C14)
Provide education and training to local policy makers (C15)
Provide outreach at trade shows and conferences (C16)
Provide outreach to schools (e.g., presentations, poster contests, scholarships) (C17)
Provide public service announcements (C18)

Demonstrate interactive floodplain and watershed models (C19)
Promote placement of historical high water markers (C20)
Develop risk notification tools (e.g., letters, website, maps) (C21)
Promote non-structural floodproofing methods (C22)
Provide flood map information (e.g., Base Flood Elevation [BFE], flood zone, map index) (D01)
Provide general technical assistance to customers (e.g., construction techniques, site-specific risk assessments, insurance information) (D02)
Assist in resolution of flood insurance problems (D03)
Document flooding complaints (D04)
Provide copies of documents (e.g., Elevation Certificates [EC]s, forms, certificates) (D05)
Provide substantial damage letters for Increased Cost of Compliance (ICC) (D06)
Provide program information (e.g., National Flood Insurance Program [NFIP], Community Rating System [CRS], Hazard Mitigation Grant Program [HMGP]) (D07)
Refer customers to other agencies/resources (e.g., websites, contractors, United States Army Corps of Engineers [USACE]) (D08)
Explain processes to customers (e.g., regulations, Letters of Map Change [LOMCs], permits) (D09)
Review Letters of Map Change (LOMCs) and newly generated Base Flood Elevation (BFE) data (E01)
Maintain maps, Flood Insurance Studies (FISs) and other supporting data (E02)
Support Hydrologic and Hydraulic (H&H) analyses for riverine, coastal, and other areas (E03)
Develop future conditions floodplain maps (E04)
Determine best available data (e.g., topography, Hydrologic and Hydraulic [H&H], historical) (E05)
Map repetitive loss areas (E06)
Support flood risk mapping (e.g., MapMod, RiskMap) (E07)
Support community coordination during flood risk mapping process (e.g., MapMod, RiskMap) (E08)
Generate flood hazard maps (E09)
Utilize Geographic Information Systems (GIS) (E10)
Implement Community Rating System (CRS) programs (F01)
Develop flood warning systems (F02)
Pursue mitigation and planning grants/funding (F03)
Promote No Adverse Impact (NAI) (F04)
Participate in local emergency planning (F05)
Implement hazard mitigation plans (F06)
Coordinate with local emergency responders (e.g., Urban Search and Rescue [USAR], police/fire, Emergency Management Agency [EMA] directors) (F07)
Coordinate flood mitigation programs with other agencies (F08)
Assist with emergency Action, Evacuation, and Response plans (F09)

Implement emergency Action, Evacuation, and Response plans (G01)
Coordinate with Incident Command Structure (ICS) (G02)
Participate in preliminary damage assessments (G03)
Document extent of flooding and other disasters (G04)
Identify frequency of flood event (G05)
Conduct damage assessment surveys (G06)
Assess substantial improvements/damages (G07)
Implement disaster recovery/debris management plans (G08)
Assess rebuilding requirements based on event (G09)
Collect other agencies' damage data (G10)
Communicate damages to decision makers (G11)
Solicit assistance from others (e.g., Emergency Management Assistance Compact [EMAC], State Mutual Aid Compact [SMAC], mutual aid) (G12)
Rectify compliance issues (G13)
Participate in preparing mitigation grant and assistance applications (e.g., Public Assistance [PA], Hazard Mitigation Grant Program [HMGP], Federal Mitigation Assistance [FMA], Severe Repetitive Loss [SRL], and Repetitive Flood Claims Program [RFC]) (G14)
Document Federal and State response recovery grants and loans (G15)

Survey Knowledge and Skill Statements
Knowledge of National Flood Insurance Program (NFIP)
Knowledge of basic mathematics/statistics
Knowledge of Federal Emergency Management Agency (FEMA) / State contacts
Knowledge of 44 Code of Federal Regulations (CFR)
Knowledge of Coastal Barrier Resource Area (CBRA) zones
Knowledge of Geographic Information System (GIS)
Knowledge of permitting process
Knowledge of building codes
Knowledge of floodplain mapping
Knowledge of construction techniques
Knowledge of grant opportunities
Knowledge of other agency or department regulations
Knowledge of planning/zoning concepts
Knowledge of Incident Command Structure (ICS)
Knowledge of environmental regulations

Knowledge of geomorphology
Knowledge of Global Positioning System (GPS)
Knowledge of mutual aid agreements
Knowledge of development standards
Knowledge of dam break and inundation
Knowledge of natural and beneficial functions of floodplains
Knowledge of hydrology/hydraulics concepts
Knowledge of nonstructural/structural flood-proofing methodologies
Knowledge of community/state/federal resources
Skill in conflict resolution
Skill in public speaking
Skill in time management
Skill in multitasking
Skill in problem solving
Skill in facilitation
Skill in leadership
Skill in organization
Skill in computer software
Skill in customer service
Skill in map reading
Skill in communication (written, verbal, listening)
Skill in dealing with difficult people

M. DACUM Research Chart (including Duties H and I)

DACUM Research Chart for Floodplain Managers

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**Association of State Floodplain Managers
Madison, WI**

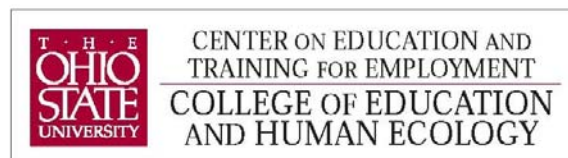
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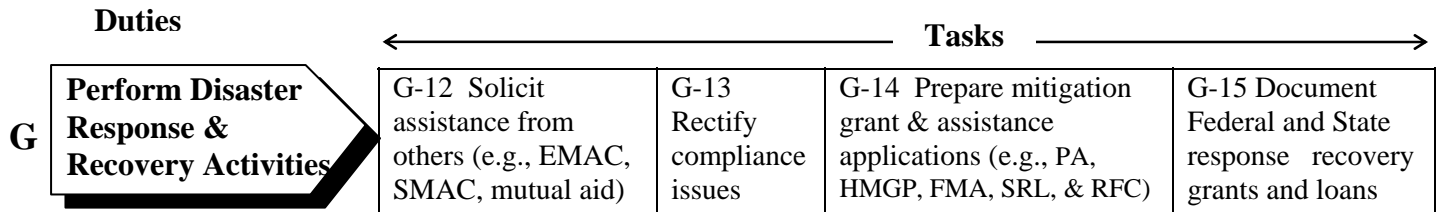
July 20-21, 2009

DACUM Research Chart for Floodplain Managers

Duties		← Tasks →			
A	Administer Floodplain Management Programs	A-1 Review local, state, & federal development regulations	A-2 Conduct pre-development meetings (e.g. developers, design professionals, stakeholders)	A-3 Process floodplain development permits	A-4 Review Elevation Certificates (ECs)
		A-11 Maintain floodplain ordinances (e.g., model, local, state)	A-12 Interpret floodplain ordinances	A-13 Implement higher regulatory standards (e.g., NAI, CRS, LID)	A-14 Develop policy/position papers, business plans (e.g., 5-year, short & long term)
		A-20 Update floodplain management executive orders	A-21 Reconcile conflicting guidance	A-22 Advocate for floodplain-related legislation	A-23 Develop funding mechanisms (e.g., storm water utilities, grants, special funding)
B	Perform Hazard Identification & Risk Assessment	B-1 Document flood events	B-2 Collect localized data (e.g., rainfall, streamgage data, historical flooding info.)	B-3 Evaluate levee certifications	B-4 Identify at-risk properties behind levees
		B-12 Communicate loss estimation models to decision makers	B-13 Assist with implementing hazard mitigation plans	B-14 Coordinate watershed development across jurisdictional lines	B-15 Identify RL & SRL areas
C	Perform Outreach Activities	C-1 Promote higher development standards (e.g., NAI, freeboard, CRS)	C-2 Participate in community events (e.g., Earth Day, Rotary, open house)	C-3 Promote flood awareness week/month	C-4 Prepare media press releases
		C-11 Organize state & regional conferences	C-12 Conduct training workshops	C-13 Publish floodplain management newsletters	C-14 Provide education & training to local policy makers
D	Perform Customer Service Activities	D-1 Provide flood map information (e.g., BFE, flood zone, map index)	D-2 Provide general technical assistance to customers (e.g., construction techniques, site-specific risk assessments, insurance information)	D-3 Assist in resolution of flood insurance problems	
		E-1 Review LOMCs & newly generated BFE data	E-2 Maintain maps, FISs & other supporting data	E-3 Support H&H for riverine, coastal, & other areas	E-4 Develop future conditions floodplain maps
F	Perform Mitigation & Preparedness Activities	F-1 Implement Community Rating System (CRS) programs	F-2 Develop flood warning systems	F-3 Develop BMPs for LID & green infrastructure	F-4 Pursue mitigation & planning grants/funding
		F-11 Assist with emergency Action, Evacuation, & Response plans			
G	Perform Disaster Response & Recovery Activities	G-1 Implement emergency Action, Evacuation & Response plans	G-2 Coordinate with ICS	G-3 Participate in preliminary damage assessments	G-4 Document extent of flooding & other disasters
					G-5 Identify frequency of flood event

A-5 Conduct code compliance inspections	A-6 Participate in CAVs & CACs	A-7 Conduct site inspections (e.g., pre/post development, compliance)	A-8 Maintain permit files & documents (e.g., repetitive loss, ECs, LOMC's)	A-9 Review variance requests	A-10 Develop floodplain ordinances
A-15 Address floodplain ordinance violations (e.g., legal actions, stop work orders, 1316)	A-16 Complete FEMA Biennial Reports	A-17 Participate in community meetings	A-18 Coordinate floodplain activities with other agencies (e.g., federal, state, nonprofit)	A-19 Provide technical expertise to policy makers	
A-24 Populate program databases (e.g., CIS, MIP)	A-25 Mentor new floodplain managers				
B-5 Develop levee breach maps	B-6 Develop levee protection zone maps	B-7 Evaluate dam & levee safety	B-8 Develop watershed master plans	B-9 Develop storm water management plans	B-10 Develop master drainage plans
B-11 Conduct risk modeling (e.g., HAZUS, FIA, FDA)					
B-16 Identify unique flooding risks (e.g., ice jams, alluvial fans, tsunamis)	B-17 Promote placement & retention of stream & tidal gages	B-18 Identify placement location for warning signs (e.g., evacuation, flood risk)			
C-5 Participate in media interviews	C-6 Publish outreach brochures & handouts	C-7 Distribute outreach brochures & handouts	C-8 Assist with website development	C-9 Develop outreach partnerships with other agencies (e.g., NOAA, utility mailouts, watershed councils)	C-10 Provide training to other professional groups (e.g., engineers, surveyors, realtors)
C-16 Provide outreach to schools (e.g., presentations, poster contests, scholarships)	C-17 Provide public service announcements	C-18 Demonstrate interactive floodplain & watershed models	C-19 Promote placement of historical high water markers	C-20 Develop risk notification tools (e.g., letters, website, maps)	C-21 Promote non-structural floodproofing methods
D-4 Document flooding complaints	D-5 Provide copies of documents (e.g., ECs, forms, certificates)	D-6 Provide substantial damage letters for ICC	D-7 Provide program information (e.g., NFIP, CRS, UHMA)	D-8 Refer customers to other agencies/resources (e.g., websites, contractors, USACE)	D-9 Explain processes to customers (e.g., regulations, LOMCs, permits)
E-5 Determine best available data (e.g., topography, H&H, historical)	E-6 Map repetitive loss areas	E-7 Support flood risk mapping (e.g. MapMod, RiskMap)	E-8 Support community coordination during flood risk mapping process	E-9 Generate flood hazard maps	E-10 Utilize GIS datasets
F-6 Participate in local emergency planning	F-7 Implement hazard mitigation plans	F-8 Participate in development of state & other local communities' multi-hazard mitigation plans	F-9 Coordinate with local emergency responders (e.g., USAR, police/fire, EMA directors)	F-10 Coordinate flood mitigation programs with other agencies	
G-6 Conduct damage assessment surveys	G-7 Assess substantial improvements/damages	G-8 Implement disaster recovery/debris management plans	G-9 Assess rebuilding requirements based on event	G-10 Collect other agencies' damage data	G-11 Communicate damages to decision makers

DACUM Research Chart for Floodplain Managers



Acronyms

1316	Section 1316 Declaration	HEC-HMS	Hydrologic Engineering Center-Hydrologic Modeling System
BCA	Benefit Cost Analysis	HEC-RAS	Hydrologic Engineering Center-River Analysis System
BFE	Base Flood Elevation	HMGP	Hazard Mitigation Grant Program
BMP	Best Management Practice	ICC	Increased Cost of Compliance
CAC	Community Assistance Contact	ICS	Incident Command Structure
CAV	Community Assistance Visit	LID	Low Impact Development
CFM	Certified Floodplain Manager	LOMC	Letter of Map Change
CFR	Code of Federal Regulations	MIP	Mapping Information Platform
CIS	Community Information System	NAI	No Adverse Impact
COBRA, CBRA	Coastal Barrier Resource Area or CBR Area	NFIP	National Flood Insurance Program
COE	Corps. of Engineers	NIMS	National Incident Management System
CRS	Community Rating System	NOAA	National Oceanic and Atmospheric Administration
DACUM	Developing A Curriculum	PA	Public Assistance
EC	Elevation Certificate	PE	Professional Engineer
EMA	Emergency Management Agency	RFC	Repetitive Flood Claims Program
EMAC	Emergency Management Assistance Compact	RFP	Request for Proposal
FDA	Flood Damage Assessment	RL	Repetitive Loss
FEMA	Federal Emergency Management	SDE	Substantial Damage Estimator
Agency		SMAC	State Mutual Aid Compact
FIA	Flood Impact Assessment	SRL	Severe Repetitive Loss
FIS	Flood Insurance Study	TAO	Tax Assessor's Office
FMA	Federal Mitigation Assistance	UHMA	Unified Hazard Mitigation Assistance
GIS	Geographic Information Systems	USACE	United States Army Corps. of Engineers
GPS	Global Positioning System	USAR	Urban Search and Rescue
H&H	Hydrologic and Hydraulic		
HAZUS	HAZards United States		

Worker Behaviors

Knowledgeable	Inquisitive	Passionate
Ethical	Professional	Resilient
Responsible	Honest	Responsible
Detail oriented	Enthusiastic	Advocate
Accurate	Flexible	Grounded
Organized	Non-defensive	Discerning
Empathetic	Receptive	Mentor
Competent	Proactive	Good public speaker
Confident	Non-judgmental	Sense of humor
Compliance oriented	Creative	Timely
Team player	Educated	Assertive
Fair	Compassionate	Articulate
Firm	Balanced	Consistent

General Knowledge and Skills

Conflict resolution	Basic economics	Environmental regulations
Knowledge of NFIP	Basic math/statistics	Geomorphology
Mediation skills	Public speaking skills	GPS
FEMA/State contacts	Writing skills	Mutual aid agreements
44 CFR 60.3	COBRA zones	Map reading
Stress management	GIS concerns	Development standards
Time management skills	Permitting process	Dam break & inundation
Multitasking skills	Building codes	Natural & beneficial functions of floodplain
Interpersonal skills	Problem solving skills	Hydrology/hydraulics concepts
Facilitation skills	Leadership skills	Nonstructural/structural flood-proofing methodologies
Organizational skills	Decision making skills	Communication skills (written, verbal, listening)
Keyboarding skills	Floodplain mapping	Community/state/federal resources
Computer software literacy	Construction techniques	Mental health issues (staff, customers)
Other agency regulations	Customer service	Bi or multi lingual (desirable)
Grant writing opportunities	Cultural knowledge	
Planning/zoning concepts	ICS	

Tools, Equipment, Supplies and Materials

Maps	
Printer/plotter	
Computer	
Internet/Intranet	
Phone	
Fax	
Shredder	
Copier	
General office supplies	
Workspace	
Digital camera	
Calculator	
GPS	
Vehicle/license	
File cabinets	
Scanner	
44 CFR	
Software: GIS, MS Office, HAZUS, HEC-RAS, HEC-HMS, BCA, SDE, H&H software, Permit software, EC software, TAO software	
Building codes	Boots, steel toed
Measuring tapes	Waterproof paper
Engineering scale	Binoculars
Architect scale	Bug spray
First aid kit	Boat
Waders	Radios
Hard hat	Generator
Protective eyewear	Police scanner
Hand sanitizer	Weather alert radio
Personal flotation device	Flashlight
Masks	Business cards
Gloves	Authenticated identification

Future Trends and Concerns

Lack of adequate staffing & funding
Climate change
Inadequate software/hardware
Combined recovery/debris management plan
Levee issues
Rapid growth of coastal areas
Lack of stream, rainfall & tidal gages
FEMA as a stand-alone agency
Inadequately trained staff
Mentoring state/local floodplain managers
Lack of college degrees and curriculum for floodplain management
Capturing BFE data
Communicating actual risk
Lack of authority to resolve flood insurance issues
Legal attacks on floodplain managers
Lack of training required for floodplain managers
Consistent coordination with emergency management
Disconnect between regulatory and insurance sides
Lack of higher standards in local ordinances
Lack of all hazards insurance
Insufficient funding for flood hazard mapping
Challenge of ensuring compliance
Rapid growth in watersheds
Lack of respect for floodplain regulations

RECOMMENDED PROCEDURES FOR CFM® EXAMINATION MAINTENANCE (5-19-2010)

Conducting Cycle “Question Analysis”

PURPOSE: to conduct regular maintenance on the examination form (and question bank) to identify poor-performing questions for repair or replacement. Annual is a common frequency, but any cycle is appropriate with enough test-takers.

1. Near the end of an exam cycle, prepare to output the actual candidate responses to each question to a spreadsheet or text file. At this time, recruit 4-6 individuals who will be the panel for this process.
2. When the examination cycle ends and question analysis is being planned, output the data file, which should have the candidate's name (or ID#) followed by a space or a tab and then 120 letter responses that represent the actual responses of each candidate to each of the 120 questions. The key or set of correct responses will be needed as well.
3. Run the candidate data (separately by series) through a “question analysis” software package – CETE staff use Iteman (www.assess.com) (Iteman 4.0 is the current version, as explained in the final report, and recommend it).
4. Question analysis software produces output that should be copied for each person participating. At the review, copies of each examination form will also be required.
5. The review team (or sub-teams of 2-3 persons) goes through each question, paying special attention to those that are “flagged” for further review by one or more of the following (illustrated with red / green for Exam 09 in Attachment J)
 - A. Very easy questions (more of a problem than extremely difficult ones), answered correctly by >80-90% of the test takers, should be reviewed with a goal of repairing or replacing them (Attachment J highlights poor with red)
 - B. Questions that do not discriminate among examinees—question-total correlation that is <.10 (including negative values)—should be repaired or replaced (Attachment J notes with green-red good & bad questions)
 - C. Options for questions that are not drawing any responses from test-takers create the very easy values, and should be reviewed for repair or replacement. This should be done for ALL questions, whether or not flagged, to improve the discrimination of the questions between how and high scorers.
6. For each flagged question, the panel should set aside a fixed amount of time (we have found that 3-5 minutes is enough for most questions) and discuss the question with the goal of making changes or replacing it. The repaired or replaced question is evaluated in the following examination cycle (did the fix work or is another patch necessary?).
7. Any changes to the questions should be entered directly into the database, and documented using standard CBOR procedures AND / OR the Notes section of the database.
8. It is desirable to write a very short 1-2 page document summarizing each cycle's question analysis process. A suggested outline might be organized along the lines of who, what, when, how, etc.

Calculating the Cut Score for a Specific Examination Form

PURPOSE: to calculate a defensible cut score for forms using average judgments made about minimally competent candidates in a question-by-question analysis by the expert panel. Those Angoff weights are in the question bank.

1. First, select questions from the database that will make up the examination form in the next cycle (Exam 010). Those questions must be marked in the database because they are a subset (120 questions) that forms the basis for averaging question Angoff weights – CETE uses a sequence # (1-120) entered in a field named Form010 in a question bank database (the two series could be marked in two fields). This process uses information in the question bank database.
2. Second, a database query outputs or averages the Angoff minimally-competent candidate value for the chosen questions [logic is to create an equation such as, “For Q#1-120, average the Angoff field and output the mean”]. The average, across Angoff weights for each question, is the cut score that should be used for that Form-Series. When forms consisting of different questions are used, use two fields in the question bank for sequence# and repeat the process for each set of fields (average the Angoff weights).
3. Third, as part of the annual review that includes the question analysis as described above, calculate percent passing the examination for each form, and provide this value as part of a report published for stakeholders. If you calculate reliability as recommended in the final report by CETE-SeaCrest, report those values in this report as well (reliability overall and by topic area). Calculating and reporting the conditional standard error of measurement for the cut score as recommended in the final report can also be accomplished (Biddle, 2005 gives guidance on how to do this calculation).