



Federal Emergency Management Agency

Washington, D.C. 20472

August 16, 2004

MEMORANDUM FOR: Regional and Headquarters Engineers

FROM: Doug Bellomo, P.E., CFM, Acting Chief,
Hazard Identification Section
[Original signed]

SUBJECT: Policy for Accepting Numerical Models for Use in the NFIP

Background: With a memorandum dated April 12, 1999, we released an updated version of the lists collectively entitled “Numerical Models Accepted by FEMA for the National Flood Insurance Program (NFIP) Usage.” In a follow-up memorandum dated July 13, 1999, we specified procedures to follow for accepting numerical models for flood hazard mapping and adding them to those lists. The purpose of this memorandum is to update those procedures.

The April 12 memorandum included six lists that the Hazard Identification Section maintains as a means of ensuring consistency in implementing Paragraph 44 CFR 65.6(a)(6) of the NFIP regulations. This paragraph explains conditions under which a computer model can be used for flood hazard mapping in the NFIP. Four of the lists cite hydrologic, hydraulic, and statistical models that are nationally accepted. The other two lists cite hydrologic and hydraulic models that are locally accepted. For your convenience, the lists are posted on the Flood Hazard Mapping portion of our website at www.fema.gov/fhm/. They can be accessed under the “Forms, Documents, and Software” section, or directly at http://www.fema.gov/fhm/en_modl.shtm.

Of the two main parts, Nationally Accepted Models and Locally Accepted Models, the latter contains models developed to address particular local conditions; these models may not be applicable nationwide.

As you are aware, we cannot accept Flood Insurance Studies that are performed with numerical models other than those on the aforementioned list. Please visit the website for the most up-to-date versions of the lists, which will be updated periodically.

Applicable NFIP Regulations

As Paragraph 65.6(a)(6) of the NFIP regulations states, any computer program used to perform hydrologic and hydraulic analyses in support of a flood insurance map revision must meet all the following criteria:

1. The model must be reviewed, tested, and accepted by a government agency responsible for the implementation of programs for flood control and/or regulation of floodplains.
2. The model must be well documented, including source codes and user’s manuals.

3. The model must be available to the Department of Homeland Security's Federal Emergency Management Agency (FEMA) and all present and future parties affected by flood insurance mapping that is developed or amended through the use of the model.

Explanation of Conditions

Coastal, hydrologic, hydraulic, and hydrodynamic models developed by Federal agencies responsible for the implementation of flood-control programs, floodplain regulation, and/or flood hazard analysis clearly meet the criteria stated in Paragraph 65.6(a)(6)(i) of the NFIP regulations. These criteria can be extended to include Federal agencies such as the U.S. Geological Survey that are not responsible for flood-control programs and floodplain regulations but are active in developing and advancing hydrologic and hydraulic models. To comply with requirement (1) above, models developed by non-Federal agencies or private entities must be certified by a governmental agency responsible for the implementation of programs for flood control and/or regulation of floodplain lands, and such models must meet the following criteria:

- The model must be used or planned to be used by communities for NFIP studies;
- The model must provide for new capabilities beyond any non-proprietary model on the existing accepted models lists; and
- The model must be reviewed, tested, and accepted with respect to its use in the design of flood-control structures or floodplain land use regulation. A written certification must be provided by the review agency to FEMA. Certification criteria are described in detail in a document entitled "Clarification of National Flood Insurance Program Criteria for Certification of Coastal, Hydrologic, and Hydraulic Models," dated October 10, 2001, which is attached to this memorandum and also available at our website at http://www.fema.gov/fhm/dl_cmodl.shtm.

In several previous instances, FEMA has reviewed and tested a proprietary model for possible inclusion in the Accepted Models lists. However, after the date of this memorandum, FEMA will no longer review and test any proprietary model. Another government agency that is familiar with the model should be contacted to certify its use. FEMA will provide necessary assistance to the certifying agency upon request. The certifying agency must review and test the model to determine whether the model is scientifically correct and technically sound, and whether the model can provide adequate information to support NFIP study and mapping. While Federal agencies can certify a model for nationwide use, State and regional agencies can certify a model for use within their jurisdiction. The certification document must be provided by an agency official with authority to certify the model on behalf of that agency. FEMA will review and evaluate the certification materials provided by the certifying agency to make the final determination on whether the model meets the minimum requirements of the NFIP.

With regard to requirements (2) and (3) above, we understand that many models developed by private entities, such as software developers, are often proprietary in nature. The conditions listed are not meant to infringe upon the software developer's rights. Under Paragraph 67.8(e) of

the NFIP regulations, FEMA is obligated to ensure that parties affected by floodplain mapping have the right to appeal map actions. Computed Base Flood Elevations (BFEs) can be appealed only if they are believed to be scientifically or technically incorrect. As part of an appeal resolution, it may be necessary that the source codes and user's manuals for the computer program used to develop or amend the BFEs be made available to affected parties who can demonstrate the need to review the model. This is necessary to allow the affected parties to evaluate the methodology used to compute the BFEs.

We have developed two sample disclosure agreements that both protect the interests of software developers and meet the procedural and technical guidelines of Parts 65 and 67 of the NFIP regulations. The first, entitled "Conditional Permission to Disclose Source Code and User's Manual," is a general agreement between FEMA and a model developer, stating that the model developer will release the source code and user's manual to any appellant who demonstrates the need to review the model. This agreement is concluded before a model is added to one of the aforementioned list. The second, entitled "Disclosure Agreement Between Model Developer and Impacted Party," is an agreement between the model developer and an appellant that provides for release of the source code and user's manual to the appellant and requires the appellant to protect the proprietary rights of the model developer. This second agreement is used only when an appeal is received. Copies of these agreements are available upon request. Samples of both documents are available from our website at http://www.fema.gov/fhm/dl_cnprm.shtm.

Removal of an Accepted Model

**This Document is Superseded.
For Reference Only.**

A model will be removed from the list if it meets one of the following conditions:

- The model is no longer supported by the agency that developed, supported, or certified the model;
- The model has not been used for an NFIP study or revision for 5 years, and no effective NFIP study is based on the model; or
- The model is no longer supported by current computer hardware or operating systems.

A list of "Numerical Models No Longer Accepted by FEMA for NFIP Usage" is available at http://www.fema.gov/fhm/en_nacpt.shtm.

The above procedures must be used to add a model to the lists of "Numerical Models Accepted by FEMA for National Flood Insurance Program (NFIP) Usage." (Because all listed models meet the minimum requirements of the NFIP; in the next release, the overall title of the lists will change to "Numerical Models Meeting the Minimum Requirements of the NFIP.") If you have any comments or questions, please contact Ms. Kelly Bronowicz, Project Engineer, of our Headquarters staff in Washington, D.C., by telephone at (202) 646-2559 or by fax at (202) 646-4596.