LMVPD-P

Lake Pontchartrain, La., and Vicinity, Hurricane Project

XX THRU C/Pol & LR Plng Br

Arnold Robbins

22 Aug 78
Robbins/ea/383

TO C/Plng Div

1. I have checked with NOD relative to General Marshall's question about recent work on the Standard Project Hurricane, which might indicate (a) that there would be a greater than previously indicated level of protection for the existing lakefront levees, and/or (b) that the critical path of the design hurricane for Corps studies is wrong.

2. Based on discussion with Mr. Jack Comb, LMNED-HC, Mr. Alfred Becnel, LMNED-H, and Mr. Robert Lougue, LMVED-W, on 18 August 1978, and with Mr. Estes Walker, LMVED-WH, on 21 August 1978, there is no information available to the Corps to indicate that our position on the degree of protection (35-40-yr.) of the existing levees is questionable or should be reconsidered. Our studies indicate that the 10 miles (±) of existing Citrus and New Orleans Eastslevees would be subject to wavemovertopping during the design hurricane, and that such overtopping in the absence of the project barriers would amount to about 7 c.f.s. per linear foot of levee.

3. Mr. Crawford with the National Weather Service has been doing some work with a mathematical model of storm surges for the project area and has prepared a preliminary report on his work. It may be that report which is the basis of Mr. Guy LeMieux's understanding or misunderstanding of the level of protection afforded by the existing levees. We don't know the exact content of Mr. Crawford's preliminary report. However, the District is trying to obtain a copy to send to Mr. Walker. I will try to get a copy for your information.

ARNOLD V. ROBBINS

LAKE PONTCHARTRAIN HURRICANE PROTECTION PROJECT
LEVEL OF PROTECTION

1. Corps of Engineers' Regulations and Guidance.

a. EP 1165-2-1 (Red Book). On page A-75 this EP states "Hurricane Protection Projects. Design storms vary with the nature of the area being protected and the type of protection being provided. Beach nourishment projects providing hurricane protection to developments of low intensity may have design storms of 10-year exceedence frequency whereas high dikes and floodwalls protecting urban areas are generally designed for the standard project hurricane."

b. Engineer Regulations. I find no regulation that specifically addresses the level of protection for hurricane projects. We have ER 1105-2-111, Flood Damage Prevention: Level of Protection, in draft form for review at the present. This ER states in paragraph 7 "Policy On Level of Protection, subparagraph a. On the assumption that the exceedence of design flow would cause a castastrophe, the Standard Project Flood (SPF) is the minimum level of protection that District Engineers should recommend for high levees, high floodwalls, and high velocity channels in urban areas. Higher levels of protection using design floods up to the probable maximum flood (PMF) should be considered in the plan formulation process discussed in paragraph 5 and may be recommended if incrementally justified."

While this regulation does not specifically refer to hurricanes, I think that the rationale is even more appropriate here than it is for flood control projects since the advance warning is often of shorter duration because of the unpredictable path of the hurricane.

2. Level of Protection Authorized for Lake Pontchartrain. On page 61 of House Document No. 231, 89th Congress, 1st Session (which is the authorizing document for this project), paragraph 17-B states "Design Hurricane. Areas to be protected are highly developed for residential, commercial, and industrial uses or have immediate potential for such development. Because of the serious threat of human life and property involved, the design of the protection plan must be based on the Standard Project Hurricane for the region as described in paragraph 9. Additional details pertinent to the design hurricane are shown in Appendix A." In the description of the Standard Project Hurricane in paragraph 9, the frequency is given as once in about 200 years. This frequency is presently estimated as being about once in 250 years. In paragraph A-5, Design Hurricane, of Appendix A, which is presented on page 134 of the House Document, subparagraph a states "Selection of the Design Hurricane. The Standard Project Hurricane was selected as the design hurricane (Des H) due to the urban nature of the study area. A design hurricane of lesser

intensity which would indicate a lower levee grade and an increased frequency would expose the protected areas to hazards to life and property that would be disastrous in event of the occurrence of a hurricane of the intensity and destructive capability of the Standard Project Hurricane."

3. Level of Protection Without Barriers. If the presently designed levee system is completed and the barrier complex is not constructed, the level of protection would be for a storm of about 35 to 40 year frequency.

8 Jun 78

TESTIMONY BY CORPS OF ENGINEERS ON FLOODING IN NEW ORLEANS EAST FOR SPH CRITICAL TO SOUTH SHORE OF LAKE PONTCHARTRAIN WITH LEVEES TO BARRIER GRADES BUT NO BARRIERS IN PLACE

No record is available for the hearing at which the testimony was given. The following is based on the recall of the witness and others present.

The question asked was: What would the effect, in N.O. East area, of the SPH critical to Lake Pontchartrain South Shore occurring with levees to barrier grade but no barrier in place be?

The answer given was: The levee would be subject to overtopping by waves. Assuming no crevasse, the volume of such overtopping would be 16,000 acre-feet, resulting in an increase in the flooding depth caused by rainfall alone of 0.8 foot. This, combined with the 0.8 foot depth generated by rainfall alone, would yield a total depth of about 1.6 feet. There would be essentially no overtopping with the barrier. The question was directly solely at the New Orleans East Area. That area is essentially flat which minimizes maximum depths of flooding.

The same situation in the Citrus area, for example, would cause much deeper flooding. In that area, where ground elevations range from -8 feet to +5 feet msl, flooding depths of as much as 6 feet would result from the occurrence of the SPH critical to South Shore with levees at barrier grades but no barrier in place. With the barrier in place, the hurricane overflow would be essentially eliminated and flooding depths, resulting from rainfall only, reduced to about 2 feet.

In the area of Orleans Parish between the Industrial Canal and Franklin Avenue, the same situation would result in flooding to maximum depths of 8 feet. With the barrier completed, the depth of flooding, resulting from rainfall only, would be only 2 feet.

The situation would be similar in other parts of Orleans Parish and in Jefferson Parish.

FACSIMILE HEADER SHEET
(ER 105-1-5)

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Lake Pontchartrain, Louisiana and Vicinity

FREQUENCY ESTIMATES FOR DESIGN

The interim survey report on Lake Pontchartrain (dated 21 Nov 62) states (page 24, para. 9) that the standard project hurricane (SPH) for the coastal region of Louisiana corresponds to one having a frequency of once in about 200 years* in the study area. Design Memorandum No. 1, Hydrology and Hydraulic Analysis, Part 1-Chalmette (dated August 1966) describes the procedure for making frequency estimates based on US Weather Bureau revised SPH wind field patterns (page 18, para. 8c(1)). The design hurricane has a frequency of about once in 300 years on the south shore of Lake Pontchartrain. For the Lake Borgne area, the frequency is about once in 200 years. Accordingly, the frequency of the SPH most used in public releases is about once in 250 years. The procedure for the determination of frequency is described in para. 9 beginning on page 25 of DM No. 1. The levees in the authorized plan without the barrier would provide protection from a storm having a frequency of 35-40 years.

GUIDANCE

EP 1165-2-1 dated 10 Jan 75 (page A-75, para. b) states in part that "high dikes and floodwalls protecting urban areas are generally designed for the standard project hurricane."

The only other reference we could find, EC 1105-2-47, Flood Damage Reduction Policy: Levee of Protection" which expired in Dec 1976 (but is still listed in the index of publications) states (page 2, para 6) "that SPF's commonly have exceedence intervals from a few hundred to a few thousand years."

*Note: The SPH has a frequency of once on 100 years for the Louisiana coastal region. SPH's for other areas are based on observed characteristics of hurricanes which have occurred in the locale.

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