



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

JUN 27 1980

MEMORANDUM FOR: Harold R. Denton, Director  
Office of Nuclear Reactor Regulation

FROM: Robert J. Budnitz, Director  
Office of Nuclear Regulatory Research

SUBJECT: ENDORSEMENT OF RESEARCH PROGRAM, ENTITLED  
"SURGE, WAVE AND METEOROLOGICAL MEASUREMENTS ALONG THE  
COAST OF FLORIDA" (RES-80-3)

This program had been established jointly by the Office of Nuclear Reactor Regulation (NRR) and the Office of Standards Development (SD) for the purpose of collecting data on surges caused by high wind hurricanes in order to provide factual information on inundation of coastal areas on the eastern shores of Florida. After the program was established and the contract given to the University of Florida by NRR, the project was transferred to the Office of Nuclear Regulatory Research (RES). RES continued this research until FY1979. RES has presently joined other government agencies for conducting this program through interagency cooperation and participation in order to formulate a cost-effective program and reduce NRC funding. The primary contributors to this program are the Waterways Experiment Station, U. S. Army Corps of Engineers, Department of Army, and the State of Florida. It is expected that other agencies may join this program.

During the years that NRC sponsored the program, a highly reliable and unique gage for water level measurement was developed, surpassing all known similar instruments. This gage is described in a 109-page report, NUREG/CR-1354, entitled "A Microprocessor Based Underwater Data Acquisition System." The gage consists of a near-bottom mounted pressure transducer and a low power consuming microprocessor. On command from shore, the instrument will record ocean surface elevation data according to an internal program for approximately 6 days. Based on recorded elevation, surge information will be extracted. High quality data were obtained by using this gage during two hurricanes in 1979, "David" and "Frederick," as reported in the "Memorandum on Data Obtained During Hurricanes David (August 25, 1979 - September 7, 1979) and Frederick (August 29, 1979 - September 14, 1979)," submitted to the NRC by the University of Florida.

During the years that NRC sponsored this program, gaging stations were installed with NRC funding at five locations on the east coast of Florida. One station was installed on the west coast with the funding from the State of Florida. One additional station is being installed on the east coast. The location of the five new stations proposed in this program, and the sequence of their installation is shown on the map included in the proposal.

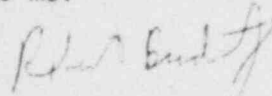
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The proposed 5-year contract will include expenses for partial maintenance of the stations and for partial cost of installation of new stations on the west coast and completion of the Jacksonville station on the east coast.

The objective of this program is collecting field data for the needs of NRC on surges during major hurricanes (those with wind speed of 125 + mph), as well as intermediate intensity hurricanes (70 + mph), for the purpose of validating and verifying models which can more realistically, and less conservatively, predict the surge from our design basis hurricanes. Meteorological measurements will be conducted simultaneously. The near-shore bathymetry of the Florida peninsula provides an excellent testing ground for a generic study of the near-shore surges and waves; i.e., there is a variety of near-shore bottom profiles around the peninsula.

Recurrence of hurricanes of a major and an intermediate intensity are 7 and 16 per 100 years respectively; i.e., on an average, the return periods are 14 and 6 years, respectively. The stations are located in such a way as to intercept each hurricane crossing the Florida east coast. The major hurricane data are necessary for a comprehensive resolution of the problem of inundation analysis for coastal nuclear power plant licensing. Because of a wide range of meteorological and bathymetric conditions existing in Florida, measurements resulting from this research will be applicable to the prediction of hurricane storm surge along the U.S. coast line and beyond. Taking into account the needs of NRC and other contributing agencies, this interagency program must be regarded as a long-term undertaking.

If you agree that the RES program described in the Enclosure is responsive to NRR needs, please indicate by signing the signature block below and return a copy of this memorandum to me.



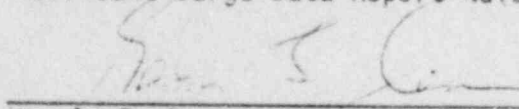
Robert J. Budnitz, Director  
Office of Nuclear Regulatory Research

Enclosure: University of Florida  
Proposal

cc: R. Mattson, NRR  
G. Knighton, NRR

Endorsement:

I agree that the research program, entitled "Surge, Wave and Meteorological Measurements Along the Coast of Florida," as defined in the enclosed research proposal, meets NRR needs subject to incorporation of the attached "Hurricane Surge Data Report Guidelines" dated 8/26/80.

  
Harold R. Denton, Director  
Office of Nuclear Reactor Regulation

  
Date

## HURRICANE SURGE DATA REPORT GUIDELINES

The data report to be submitted after each hurricane shall contain the following information in order for the NRC staff to verify and validate numerical surge models:

1. Detailed meteorological descriptions of the hurricane. These will include both data recorded by the contractee as well as data from other sources (NOAA, Airports, etc.). Important parameters include the track, the Central Pressure Index, the radius to maximum winds, and wind fields.
2. Time histories of the surges at the various stations, both with the tide and with the predicted tide removed.
3. Contoured surge inundation maps.
4. Text providing discussions and explanations as needed.
5. Data should be presented both graphically and numerically.

DEADLINE DATE

ASAP

(Date Proposal Must Be Received By Granting Agency)

UNIVERSITY OF FLORIDA  
Gainesville, Florida 32611

SEND NOTICE OF AWARD TO  
DIVISION OF SPONSORED RESEARCH  
219 Grinter Hall

APPROVAL OF PROPOSAL

RESEARCH   
TRAINING   
OTHER

(Check One)

March 19, 1980  
DATE

Title of Proposal HYDRODYNAMIC AND METEOROLOGICAL MEASUREMENTS OF HIGH WIND OVER SHALLOW WATER ALONG THE COAST OF FLORIDA

Submitted To: (Agency) U.S. Nuclear Regulatory Commission

(Division) Division of Contracts, ATTN: Mr. K. V. Morton

(Program) USNRC, Washington, DC 20555

University Unit Responsible for Research or Training and the Unit to Receive the Appropriate Indirect Cost Return

Engineering Industrial Experiment Station

Coastal & Oceanographic Engineering

Principal Investigator: (Project Director)

D. M. Sheppard  
NAME: D. M. Sheppard, Acting Chairman  
TITLE:  
TELEPHONE: 392-1436

Approval by Dean or Director:

NAME: M.J. Ohanian, Assoc. Dean of Research  
TITLE:

Approval by Dean or Director:  
(If more than one)

NAME:  
TITLE:

Co-Principal Investigator: (If Applicable)

Gary L. Howell  
NAME: Gary L. Howell, Assoc. in Eng.  
TITLE:  
TELEPHONE: 392-1436

Approval by Vice-President Health Affairs  
(For All Projects Involving I.H.M.H.C. Personnel)

NAME:  
TITLE:

Department Head:

D. M. Sheppard  
NAME: D.M. Sheppard, Acting Chairman  
TITLE:

Approval by Vice-President Academic Affairs  
(For All Projects Emanating From Research Centers)

NAME:  
TITLE:

Department Head: (If more than one involved)

Official Authorized to Sign for the University (Leave Blank)

NAME:  
TITLE:

DIVISION OF SPONSORED RESEARCH  
UNIVERSITY OF FLORIDA  
904-392-4800

SEND ALL CORRESPONDENCE RELATING TO:

Grant Administration: Division of Sponsored Research

Fiscal Matters: Engineering Financial Office

Scientific Matters: D.M. Sheppard, Coastal & Oceanographic Engineering

P.I. Check one:	
NEW	<input checked="" type="checkbox"/>
RENEWAL	<input type="checkbox"/>
CONTINUATION	<input type="checkbox"/>