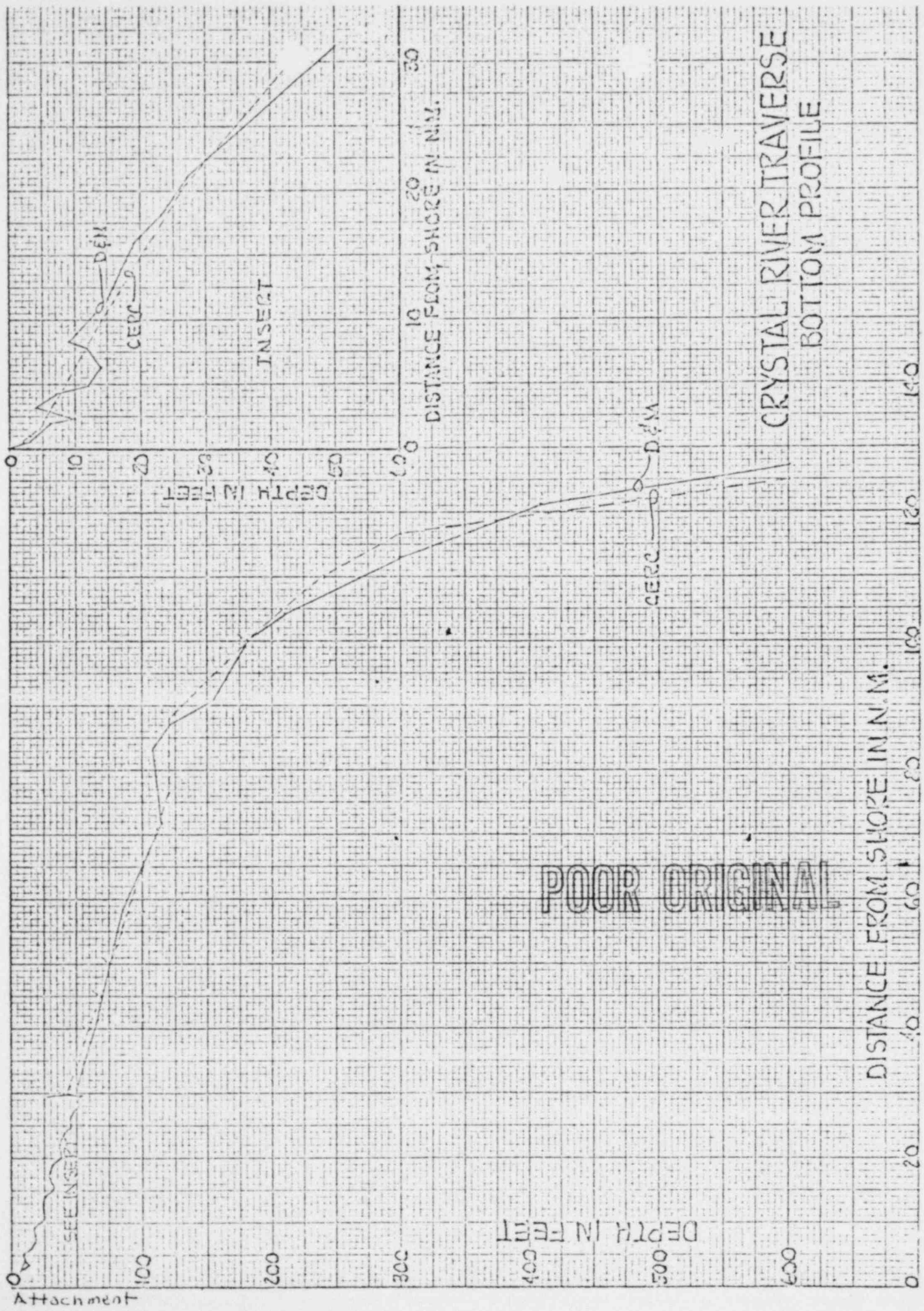


COMMENTS ON CERC TECHNICAL MEMO NO. 35;
STORM SURGE ON THE OPEN COAST:
FUNDAMENTALS AND SIMPLIFIED PREDICTION;
by B. R. Bodine; May 1971

| <u>NO.</u> | <u>PAGE</u> | <u>REMARK</u> |
|------------|-------------|---|
| 1. | 11. | The list of variables should contain a definition of S, as per page vi. |
| 2. | 14. | Equation 11 should read: $\frac{S}{X} = \frac{1}{gD} [fV + kW^2 \cos \theta]$ |
| 3. | 16. | Equations labeled 15 should have limits on i for X to i = IM, and on t to i = NM. In addition, the lower limit on i for t is i = 1. |
| 4. | 16. | Seventh line from bottom of the page, change x to x _o . |
| 5. | 17. | In the denominator of equation 18, the last subscripts (i) and superscript should be inside the parenthesis for variable D, and a closing bracket supplied after the term in the denominator. |
| 6. | 19. | The right side of the inequality for variable V should be to the $\frac{1}{2}$ power, and the multiplier 2 in the denominator should be removed. |
| 7. | 19. | The right side of the inequality in equation 24 should be to the $\frac{1}{2}$ power, and the subscript for the second B in the numerator should be i + 1. |
| 8. | 21. | The subscript for the second A term in equation 25 should be i + 1. |
| 9. | 22. | Add the following sentence after the last line of the first paragraph of section 2: "Because other parameters have also been selected from historical maximum values, the probability of a SPH occurrence would be less than the CPI probability." |

| <u>NO.</u> | <u>PAGE</u> | <u>REMARK</u> |
|------------|-------------|--|
| 10. | 23. | The third and fourth sentences of the first paragraph of section 3 should be changed to the following: "To ensure that there is minimum likelihood that the safety aspects of these power plants would be compromised during severe hurricanes (surge and wind generated wave effects) the AEC . . . AEC concluded that adequate safety would be provided if the safety-related facilities of such plants were not adversely affected by the surge . . ." |
| 11. | 25. | The subscript for the second p term on the left side of equation 32 should be deleted. |
| 12. | 26. | The first paragraph of section 2 should be modified to reflect the use of initial rise values based upon Jachowski's analysis of the 10 percent historical tidal frequency. |
| 12. | 41.-43. | Literature cited should be updated to reflect present research in calibration coefficients. |
| 13. | 45.- | The appendix should be updated to reflect the program changes made for verification studies and for PMH estimates. It is strongly suggested that the program be modified further to include printed output of all input variables in the same format as read by the program. (Furthermore, the program changes for readily making PMH estimates, to incorporate a peripheral PMH wind field program, have been made by the AEC staff.) |



SUMMARY OF HURRICANE VERIFICATIONS

| HURRICANE | LOCATION | MODEL | RUN AND DATA SOURCE | MODEL TIME INCREMENT -HOURS | INITIAL RISE, FEET | BOTTOM FRICTION COEF. | D&M WIND STRESS COEFS. $\times 10^{-6}$ | | AEC WIND STRESS CORR. FACTOR $\times 10^{-6}$ | COMPUTED PEAK ELEV., MLW | OBSERVED MAXIMUM RECORDED ELEV., MLW | REMARKS |
|-----------|-------------|-------|---------------------|-----------------------------|--------------------|-----------------------|---|------|---|--------------------------|--------------------------------------|--|
| | | | | | | | CSK1 | CSK2 | | | | |
| 1949 | Freeport | AEC | AEC | 1 | 3.4 | .007 | - | - | 1.3 | 9.65 | 9.6 | Computed peak is 7 hrs. late; fit is poor "inside" gage. |
| | Freeport | D&M | D&M | 1 | 2.63 | .0001 | 1.0 | 1.4 | - | 8.98 | 9.5 | Observed hydrograph used in model does not include tide which would shift peak backward 1 hour. Without tide computed peak value of 7.58 compares to observed value of 7.9. |
| | Galveston | AEC | AEC | 1 | 3.2 | .02 | - | - | .5 | 6.64 | 6.66 | Computed peak is 5 hrs. late; fit is good; basic data very poor. |
| Galia | Galveston | AEC | AEC | 1 | 3.1 | .02 | - | - | 1.1 | 10.67 | 10.48 | Computed peak is 3.5 hrs. late; fit is good. |
| | Galveston | D&M | AEC | 1 | 1.9 | .02 | 1.25 | 1.0 | - | 7.77 | 10.48 | |
| | Galveston | D&M | D&M | 6&3 | 1.87 | .0011 | 0.8 | 1.0 | - | 22.65 | 22.18 | Tide gage datum was 12.19 ft. below MLW. Errors noted in wind speed and angle data. (See Summary for discussion of run.) |
| | Freeport | AEC | AEC | 1 | 3.9 | .007 | - | - | 1.2 | 12.73 | 12.35 | Computed peak is 3 hrs. early; fit is |
| | Sabine Pass | D&M | D&M | 6&3 | 1.11 | .0019 | 0.8 | 1.0 | - | 8.25 | 7.96 | Observed hydrograph on computer printout is not the same as that listed in Blue Book*(Appendix D). Water level datum not specified. Hydrograph recorded in a channel - not on open coast. Computed peak value compares to 7.36, the observed maximum on printout. Errors noted in wind*speed and angle data. |

*Enclosure 2 to FP&L letter of July 13, 1973, Dames & Moore Hurricane Verification Study.

SUMMARY OF HURRICANE VERIFICATIONS (Continued)

| HURRICANE | LOCATION | MODEL | RUN AND DATA SOURCE | MODEL TIME INCREMENT -HOURS | INITIAL RISE, FEET | BOTTOM FRICTION COEF. | D&M WIND STRESS COEFS. $\times 10^{-6}$ | | AEC WIND STRESS CORR. FACTOR $\times 10^{-6}$ | COMPUTED PEAK ELEV., MLW | OBSERVED MAXIMUM RECORDED ELEV., MLW | REMARKS |
|-----------|------------------|-------|---------------------|-----------------------------|--------------------|-----------------------|---|------|---|--------------------------|--------------------------------------|---|
| | | | | | | | CSK1 | CSK2 | | | | |
| Carol | Narragansett Bay | AEC | AEC | 1 | .5 | .02 | - | - | 1.5 | 9.16 | 10.67 | Observed peak surge values of hydrograph are an extrapolation. |
| | Narragansett Bay | D&M | D&M | 3&2 | 0.12 | .001 | 1.8 | 2.2 | - | 12.81 | 10.83 | Observed hydrograph on computed printout is not the same as that listed in Blue Book (Appendix D). Computed peak value compares to 12.63, the observed maximum on printout. |
| Audrey | Eugene Island | AEC | AEC | 2 | 1.95 | .030 | - | - | 1.1 | 8.33 | 8.40 | Timing is good; fit is poor. |
| | Eugene Island | D&M | D&M | 2&1 | 2.32 | .001 | 0.8 | 1.0 | - | 8.18 | 8.15 | Recording gage is located on an island - not on open coast. Computations carried on past island to main land. |
| | Eugene Island | D&M | AEC | 2 | 1.00 | .030 | 1.0 | 1.0 | - | 5.76 | 8.40 | |
| Camille | Pass Christian | AEC | AEC | 1 | 1.2 | .0025 | - | - | 1.4 | 25.07 | 25 | Only one observation at high water mark. |
| | Biloxi | D&M | D&M | 6&3 | 1.20 | .002 | 1.0 | 1.4 | - | 19.41 | 19.15 | No hydrograph available - only peak value. Computer printout peak value is listed as 21.41 ft. MLW, which is at variance with Blue Book, p. 70 (19.41). |

SUMMARY OF HURRICANE VERIFICATIONS (Continued)

| HURRICANE | LOCATION | MODEL | RUN AND DATA SOURCE | MODEL TIME INCREMENT -HOURS | INITIAL RISE., FEET | BOTTOM FRICTION COEF. | D&M WIND STRESS COEFS. $\times 10^{-6}$ | | AEC WIND STRESS CORR. FACTOR $\times 10^{-6}$ | COMPUTED PEAK ELEV., MLW | OBSERVED MAXIMUM RECORDED ELEV., MLW | REMARKS |
|-------------|----------------|-------|---------------------|-----------------------------|---------------------|-----------------------|---|------|---|--------------------------|--------------------------------------|---|
| | | | | | | | CSK1 | CSK2 | | | | |
| PMH | Pass Christian | AEC | AEC | 0.5 | 0.80 | .003 | - | - | 1.1 | 33.8 | - | Not verified by sensitivity study of hurricane parameters. |
| | Crystal | AEC | AEC | 1&.5 | 0.60 | .003 | - | - | 1.1 | 35.4 | - | Peak reduced 2 feet for overland flooding. |
| | Crystal | D&M | D&M | 1&.25 | 0.60 | .003 | 1.0 | 1.4 | - | 31.35 | - | D & M bottom profile appears to cause early peaking. Peak reduced 2 feet for overland flooding. |
| Test Case 1 | - | AEC | AEC | .5 | 0.00 | .003 | - | - | 1.0 | - | - | A constant wind stress coefficient, $k = 2.5 \times 10^{-6}$, was used. " |
| | - | AEC | D&M | .1 | 0.00 | .003 | - | - | 1.0 | - | - | |
| | - | D&M | D&M | 1.* | 0.00 | .003 | - | - | - | - | - | |
| | - | D&M | AEC | 1.* | 0.00 | .003 | - | - | - | - | - | |
| Test Case 2 | - | AEC | AEC | .5 | 0.00 | .003 | - | - | 1.0 | - | - | " " |
| | - | AEC | D&M | .1 | 0.00 | .003 | - | - | 1.0 | - | - | " " |
| | - | D&M | D&M | 1.* | 0.00 | .003 | - | - | - | - | - | " " |
| | - | D&M | AEC | 1.* | 0.00 | .003 | - | - | - | - | - | " " |

*Variable time increment used in Dames & Moore model.