WAVE FORCE DATA SUMMARY

I. Microfilmed oscillograph records (16 mm), raw records of wave forces, profiles, and auxiliary traces.

    A. Wave Project I: 6 reels, 100 ft. each, 16 mm

        (205 hrs. of records from hurricanes, tropical storms, and winter storms)

    B. Wave Project II: 3 reels, 100 ft. each, 16 mm

        (77 hrs. of records from one hurricane and several winter storms)

II. Bound reports covering design, construction, maintenance, calibration, selected wave pressure contours, data reduction methods, and magnetic tape format descriptions.

    A. Wave Project I: 6 reports, about 300 pages total on microfilm

    B. Wave Project II: 6 reports, about 250 pages total on microfilm

III. Digitized data on magnetic tape - wave forces and profiles and related calibrations; magnetic tape compatible with IBM 360 system.

    A. Wave Project I: approximately 500 individual waves digitized at 0.2 sec intervals; one reel 2400 ft.; (individual waves were selected from hurricane records)

    B. Wave Project II: approximately 100 individual waves and 76 min. of continuous records digitized at 0.2 sec intervals; one reel, 2400 ft.; (individual waves and continuous records were selected from hurricane records)

    Note: All of microfilmed records (I) are not included in digitized data (III).

Four copies of each reel of microfilm have been made for loan purposes.

Compiled by:
Henry Odum

ERRATA FOR WAVE PROJECTS I AND II USERS' GUIDES AND DATA

CORRECTIONS TO "WAVE PROJECT I DATA USERS' GUIDE"
by L. S. Blank, August 25, 1969

1. The statement on Page 1,

   "The complete installation has been described in detail by
   Schurman[1] and Thrasher and Aagaard[2]. A plan view is shown
   in Figure 1."

   should read as follows:

   "The complete installation has been described in detail by
   Schurman[1], Thrasher and Aagaard[2], and the reports listed in
   Appendix B. A plan view for data taken after August 1956
   is shown in Figure 1. This figure applies to all the digi-
   tized data. Refer to Thrasher and Aagaard[2] for the plan
   view before August 1956."

2. Replace Figure 1 on Page 1 with the Figure 1 in the Errata.

3. The section "Correction for Staff-Dynamometer Separation
   Distance" on Page 18 should be replaced by the following:

   "Correction For Staff-Force Piling Separation Distance.

   "Two problems are inherent in the use of force data that is
   recorded at a location that is different from the location
   that the wave profile is measured. First, there is a time
   lag, Δt, between the wave profile and the force records
   that is a function of the separation distance and wave
   direction.   Secondly, the shape of the wave changes as it
   propagates and is not necessarily the same along each section
   of the crest line; this implies that the time variation of
   the wave profile at the force piling location is not neces-
   sarily the same as at the staff location. These problems
   were taken into account when digitizing the data.

   "The time lag for a given wave and force piling was calculated
   in the following manner. The time at which each of the out-
   of-water force dynamometers was first activated was determined.
   The height of the water-surface elevation at each of those
   times is equal to the height of the bottom of the corresponding
   dynamometer measured from the mudline. The distance to the
   bottom of each dynamometer was transferred to the wave profile
   by utilizing the wave-staff calibration steps that appear at
   the beginning of each record (see Figure 10) and the times
   were noted. The average difference between the times noted
   on the staff profile and those corresponding to dynamometer
   activation over all the out-of-water dynamometers was taken
   as the time lag, Δt.

"The amount of time lag by which each force data file <u>has to be</u> <u>adjusted</u> is located in Columns 49-54 of Card 1. This value is given in inches and can be converted to seconds by

$$\Delta t \text{ (sec)} = 4.0 \Delta t \text{ (inches)} \tag{4}$$

"A forward or backward shift is indicated by the sign of Δt. If $\Delta t > 0$, the wave staff was struck first, while $\Delta t < 0$ implies that the force piling was struck first. Consequently, the times in inches for the force data must be adjusted as follows:

$$TIME(J) = TIME(J) - \Delta t.$$

"The change in wave shape was accounted for in the following manner. In certain cases, for a given wave and force piling, the Δt varied according to the dynamometer that was used. This implies that the time variation of the wave profile at the force piling differed from that at the wave staff. In such cases, an 'effective' wave profile at the force piling was reconstructed by transferring the wave profile developed from dynamometer activation times onto the measured staff wave profile using the time lag (average Δt) to align the two profiles and then sketching in a new wave profile that passed through the points defined by the dynamometer activation times.

"The digitized data correspond to 'effective' wave profiles. The user should refer to the original data on microfilm for modifications made to the staff wave profiles."

4. The following corrections should be made to the Data File Numbers listed in Table I:

"21080152" should read "21080154"

"21087193" should read "21087192"

"21515133" should read "21515113"

ERRORS IN THE DIGITIZED WAVE PROJECT I DATA

The following error exists for the digitized data included in Data File 21067022:

YBAR is set equal to YC. This causes an overflow in calculating V(I), as defined by equation (3). Refer to original data on microfilm and the reports listed in Appendix B of the Guide for corrections.

ERRORS IN THE DIGITIZED WP II DATA.
Reference: "Wave Project II Users' Guide"
by L. S. Blank, May 23, 1969.

1 The Continuous Section 06886-1/01 has the following error:

The last values of file 1/08 and first values of 1/09 have the same time values. Refer to data on microfilm for necessary corrections.

2. The Continuous Section 06886-2/01, file 2/16, has the following errors in the wave profile data:

a. Time values for time indices I = 18 and 19 are the same

b. Time value jumps from 89 to 188 in going from the time index 19 to 20.

c. REF(I) is zero and ETA(I) is too large at I = 19.

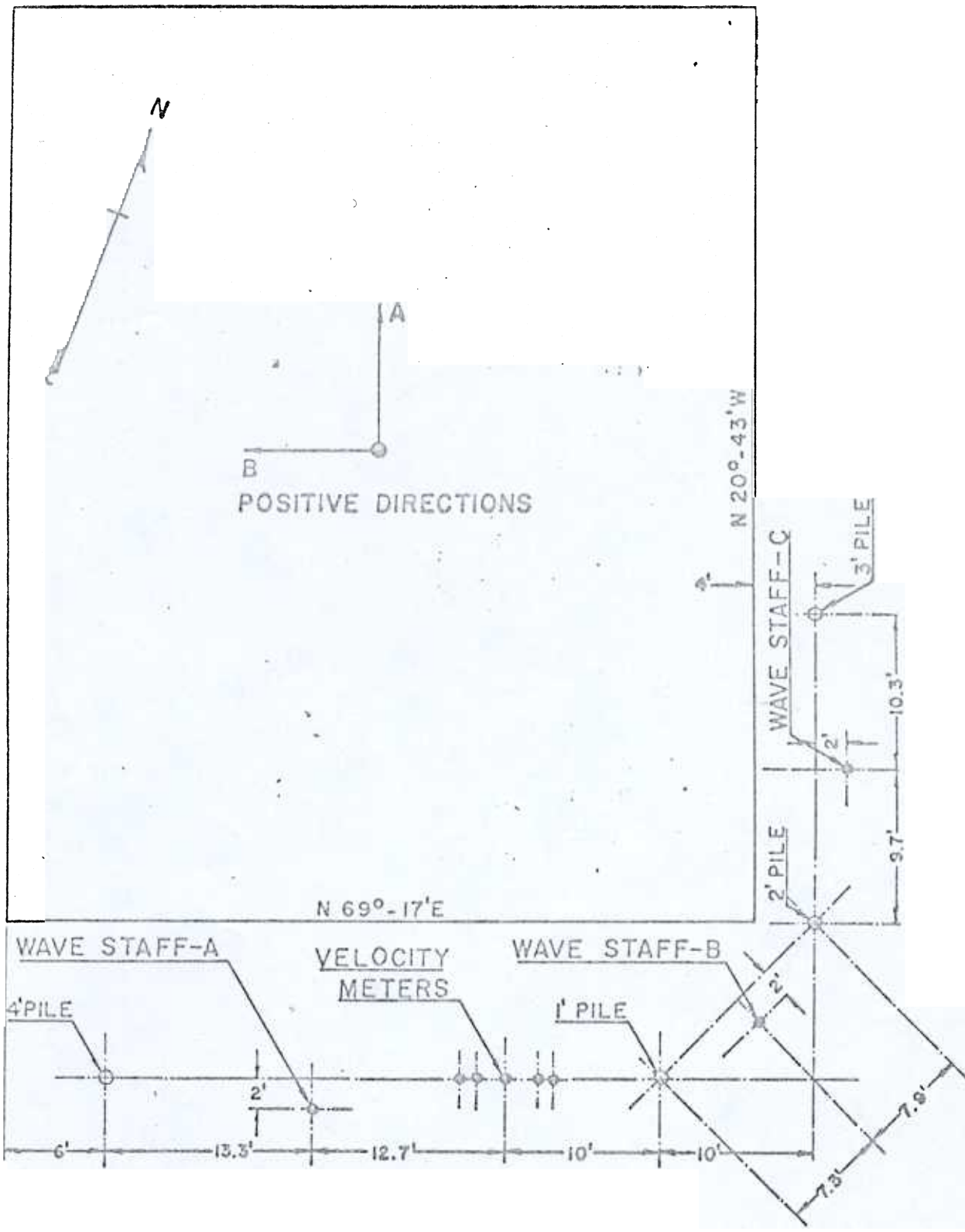Refer to data on microfilm for necessary corrections.

Attach: Figure 1

FIGURE I
PLAN VIEW OF TEST UNITS (AFTER AUGUST 1956)

SCALE: 1/10"=1"

CALIFORNIA RESEARCH CORPORATION		
OIL FIELD RESEARCH		
LA HABRA LABORATORY		
DRAWN: D B	DATE 10-29-57	LE 30-399
ENG'R: L S	PROJ: 5112	

Rec'd.
10-21-69

TO: MR. Henry Odum   N O D C   Oct 16   1969

FROM: MR. Les Blank.   COFRC

SUBJECT: OUR FILE:

YOUR FILE:

Henry:—

As mentioned in my memo yesterday, enclosed please find the tape volume containing the Wave Project II data.

The tape is unlabelled; written at 556 bpi density, and contains BCD data.

Record format is FIXED BLOCKED

Logical record length is 80 bytes (characters)

Physical record length (block size) is 1600 bytes (characters)

I have tested the volume by successfully retrieving files 1, 53, 54 and 177. You should have no problem. Data sets are sequential and correspond to the file directory in my report on WP II data.

My apologies again for the delay.

Sincerely

Les Blank.

MEMORANDUM GO-144

TO: MR. Henry Odum   Oct 30   196 9

FROM: MR. Les Black

SUBJECT: WPI 7 trk & 9 trk tape volumes.   OUR FILE:

YOUR

Henry: —

at long last are the data tapes from Wave Project I. I must apologize again for the delay but our computer has had the 7 day flu!

The 7 track tape is a non labelled tape written at 556 bpc. Non-labelled means no volume label or header & trailer labels. To be read on a 360, LABEL = (X, NL) must be coded in the label parameter while UNIT = 2400-2 is the unit parameter code. The reel is labelled WPI7T.

The 9 track is an 800 bpi, standard label tape as described in my report (complete compatability on 360). The reel and the volume are labelled NODCO2. Each data set is named WP1.

Hope we can now get into the newsletter.

Thanks for your patience,

Black

August 29, 1969

Dr. Thomas S. Austin, Director
National Oceanographic Data Center
Washington Naval Yard, Building 160
Washington, D. C. 20390

Dear Dr. Austin:

This is in further response to our exchange of correspondence
regarding deposit of wave force data at the National Oceano-
graphic Data Center.

We are sending under separate cover an additional partial
shipment of the wave data as described and agreed upon in
our prior correspondence. The present shipment is the last
one contemplated and completes the deposit of wave force data
which we had planned. The present shipment consists of the
following items:

1. Six rolls of 16 mm microfilm giving oscillograph
    records of wave height and wave force data as
    originally recorded.

2. One 2400-foot reel of magnetic tape containing
    reduced data in digital form of wave data files.

3. Six reports on Wave Project I. These reports
    describe in detail the experimental program which
    we have termed Wave Project I.

4. A revised Wave Project II Users' Guide. This is
    identical in every respect with the single copy
    of the Wave Project II Users' Guide which we forwarded
    to you under date of June 3, 1969, except that
    page 38 has been revised. We suggest that you
    destroy the original Wave Project II Users' Guide
    containing the incorrect page 38.
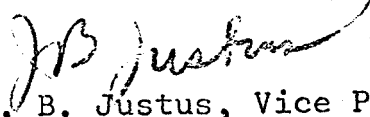
                                        Henry Odum

Please do not hesitate to call on us if we can be of assistance
in any questions which may arise concerning the information
we have sent to you.

Yours very truly,

J. B. Justus, Vice President
Production Research Department

cc: Mr. R. F. Faull

Reports, microfilm, and tape sent Registered Mail.

J. B. JUSTUS
VICE PRESIDENT
DEPARTMENT

June 3, 1969

D
N
W
W

Dear Dr. Austin:

This is in further response to our exchange of correspondence regarding deposit of wave force data at the National Oceanographic Data Center and, in particular, with respect to Mr. Faull's letter of March 14, 1969, and your reply of April 1, 1969.

We are sending under separate cover a partial shipment of the wave data as described and agreed upon in the subject correspondence. The present shipment consists of the following items:

I.   One 2400 foot reel magnetic tape, labeled NODCDA.

II. Three reels microfilm.

III. Six reports (1 each)

   1. The Clamp-On Wave Force Meter, L. Skjelbreia.

   2. Design, Construction, and Installation of Instrumentation for Wave Project II, V. Schoettle

   3. Operation of Wave Project II, Progress Report No. 3, V. Schoettle.

   4. Operation of Wave Project II; Progress Report No. 4, V. Schoettle.

   5. Operation of Wave Project II, Final Progress Report, V. Schoettle.

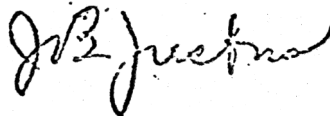   6. Wave Project II Data Users' Guide, L. S. Blank.

Henry Odum

We were pleased to receive your very nice letter of April 1 and hope that the information currently being shipped and that which is to follow will turn out to be a valuable addition to the National Oceanographic Data Center. If you have any questions you would wish to discuss by phone, may I suggest you call Mr. P. M. Aagaard at La Habra (213 - 691-2241); letters should be addressed to me at La Habra rather than Mr. Faull with whom you have previously corresponded.

Very truly yours,

cc: Mr. R. F. Faull

March 14, 1969

Dr. Thomas S. Austin, Director
National Oceanographic Data Center
Washington Naval Yard, Building 160
Washington, D. C. 20390

Dear Dr. Austin:

During recent years the Standard Oil Company of California
has carried out a project to measure and record certain
ocean behavior in the Gulf of Mexico. The projects have
been managed and carried out by technical operating teams
in two of Standard Oil Company of California's operating
subsidiaries: Chevron Oil Field Research Company and
Chevron Oil Company, The California Company Division. This
latter is Standard of California's operating group in off-
shore Louisiana, and is headquartered in New Orleans.

The data gathering effort has been funded in approximately
equal amounts by Chevron Oil Field Research Company, Esso
Production Research Company, and Shell Development Company.
The U. S. Navy at Port Hueneme, California, assisted
financially by being a data purchaser on two occasions
during the project term.

Chevron Oil Field Research Company, representing Standard
Oil Company of California and on behalf of itself and Esso
Production Research Company, Shell Development Company, and
the U. S. Navy at Port Hueneme, wish now to deposit the basic
experimental data with a public depository in such a manner
that it would be available to consultants, contractors,
universities, and such others that might make use of the data
I understand in discussing this with Dr. L. C. Bonham of our
La Habra staff that the National Oceanographic Data Center
would welcome the donation of this information, and we are
thus very pleased to offer it to you for the Data Center.

Henry Odum

The data are essentially wave forces and wave heights during
storm conditions at two locations in the Gulf of Mexico and
consist of original strip chart records on microfilm; magnetic
tapes containing digitized sections of recorded information;
and a series of reports describing project equipment, measure-
ment procedures, data reduction methods, calibrations, and
the general method of operation of the projects. A more
specific definition of the material will be furnished at the
time the data are transmitted to you.

We are presenting papers on the wave force project at the
First Annual Offshore Technology Conference in Houston,
May 18-21. Shell and Esso are also presenting papers based
on the same data at this meeting. We would plan on withholding
actual transfer of our wave force data to the National
Oceanographic Data Center until after the dates of this Offshore
Technology Conference, that is, until approximately June 1 of
this year.

We hope that you will accept deposit of our wave force informa-
tion in your Data Center. We believe the information is
unique and is of potential value to oceanographers and to
people concerned with stability and safety of offshore
structures. We look forward to hearing from you.

                    Yours very truly,

                    R F Faull