10401

Diagram No. 1117-2

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

# DESCRIPTIVE REPORT

*Type of Survey* ... Hydrographic/Side Scan Sonar

*Field No.* ... WH-10-4-91

*Registry No.* ... H-10401

## LOCALITY

*State* ... Texas

*General Locality* ... Gulf of Mexico

*Sublocality* ... 14 NM Southeast of Port Aransas

1991

CHIEF OF PARTY
CDR R.P. Floyd

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DATE ...

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| NOAA FORM 77-28 (11-72) | U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION | REGISTER NOS. |
|---|---|---|
| | **HYDROGRAPHIC TITLE SHEET** | H-10401 |
| INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in completely as possible, when the sheet is forwarded to the Office. | | FIELD NO. WH-10-04-91 |

State: TEXAS

General locality: GULF OF MEXICO

Locality: 19 ~~13~~ NM ~~EAST~~ SOUTHEAST OF PORT ARANSAS, ~~TEXAS~~

Scale: 1:20,000 Date of Survey: Sept. 9 - Nov. 16, 1991

Instructions dated: May 28, 1991 Project No.: OPR-K220-WH-91

Vessel: NOAA Ship WHITING S-329 EDP # 2930

Chief of party: Commander Richard P. Floyd

Suveyed by: R. Floyd, C. B. Greenawalt, N. Crews, R. Fletcher, K. McNitt, K. Taggart
D. Bixby, E. Berkowitz, J. Seitz, F. Cruz, A. Myers, R. Harris
E. W. A. R. E. L.

Soundings taken by echo sounder: DSF 6000N

Graphic record scaled by: WHITING survey personnel

Graphic record checked by: WHITING survey personnel

Protracted by: N/A Automated plot by: XYNETICS 1201 PLOTTER (AHS) HP 7959B, Bruning (FIELD)

Verification by: ATLANTIC HYDROGRAPHIC SECTION

Soundings in MLLW: Meters

REMARKS: Change No. 1 dated August 23, 1991

Change No. 2 dated October 1, 1991

Surveyed by 1:20,000-scale standards, plotted at 1:10,000

Field number erroneously indicates 1:10,000 survey

Junctions with H-10399, H-10400, and H-10402

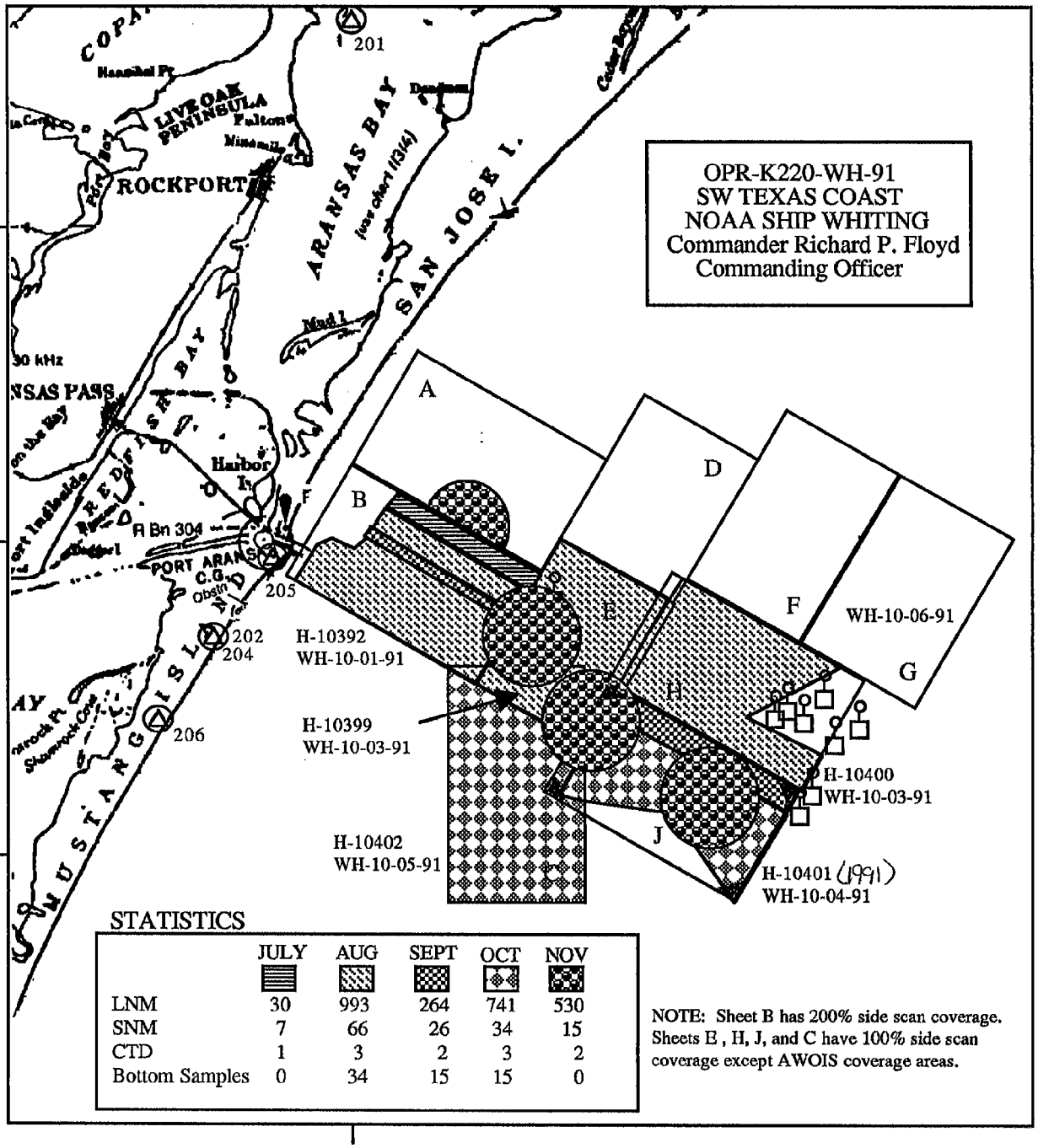
NOTES IN THE DESCRIPTIVE REPORT WERE MADE IN RED DURING OFFICE PROCESSING.

ACOIS / SURFL 9/17/93 SJV

KWW 8/8/94

NOAA FORM 77-28 SUPERSEDES FORM C & GS-537

# PROGRESS SKETCH
# NOAA SHIP WHITING
# NOVEMBER 1991




STATISTICS

| | JULY | AUG | SEPT | OCT | NOV |
|---|---|---|---|---|---|
| LNM | 30 | 993 | 264 | 741 | 530 |
| SNM | 7 | 66 | 26 | 34 | 15 |
| CTD | 1 | 3 | 2 | 3 | 2 |
| Bottom Samples | 0 | 34 | 15 | 15 | 0 |

NOTE: Sheet B has 200% side scan coverage. Sheets E , H, J, and C have 100% side scan coverage except AWOIS coverage areas.

DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY
OPR-K220-WH
FIELD NUMBER WH-10-4-91
REGISTRY NUMBER H-10401
NOAA SHIP WHITING

Cdr. Richard P. Floyd, Commanding Officer

## A. PROJECT

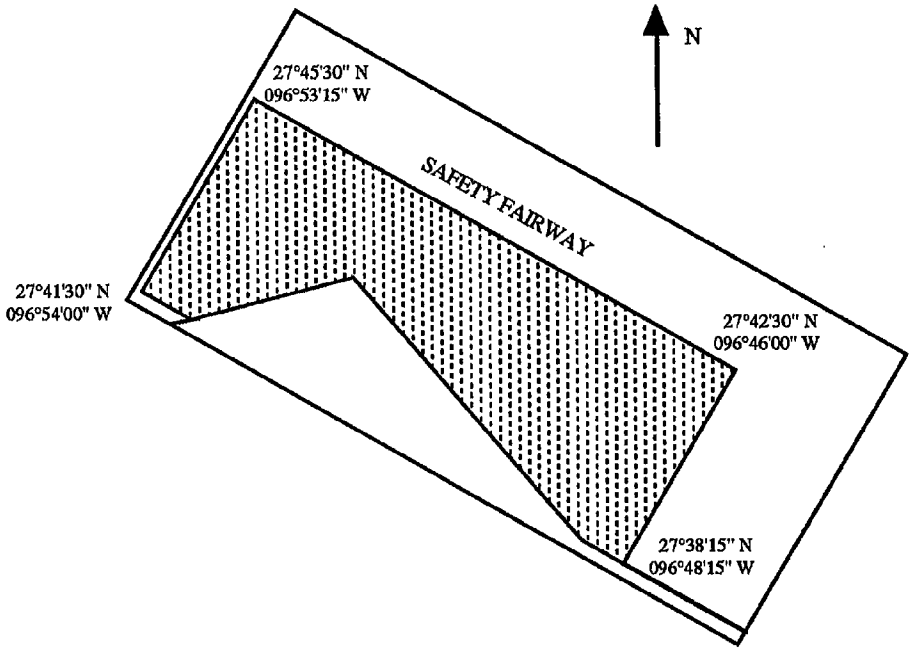
The purpose of this project was to perform a basic hydrographic survey with side scan sonar (SSS) coverage of the approaches to Corpus Christi in support of the maintenance of existing nautical charts. This area is of interest because Port Ingleside, on the north shore of Corpus Christi Bay, is being planned as a major strategic home port for the United States Navy. The area also supports a significant sport and commercial fishing industry.

This survey was designated as sheet "J", assigned a field sheet number of WH-10-4-91 and registry number H-10401. Survey operations were conducted in accordance with the May 28, 1991 Hydrographic Project Instructions, OPR-K220-WH, S.W. Texas Coast, Texas, Change Number 1 dated August 14, 1991, and with Change Number 2 dated October 1, 1991.

## B. AREA SURVEYED

Hydrographic survey H-10401 was centered in the southern portion of the safety fairway approximately 13 nautical miles east southeast of Port Aransas, TX.

The survey was bound by the following approximate limits:




Survey operations began on September ~~11~~ 9, 1991, day of year (DOY) 25~~3~~2, and were completed on November 16, 1991 (DOY 320).

WHITING acquired data during the following days:

| Gregorian Date: | DOY: |
|---|---|
| 09-10 September | 252-253 |
| 24-25 September | 267-268 |
| 03-05 October | 276-278 |
| 08-09 October | 281-282 |
| 20-22 October | 293-295 |
| 04-06 November | 308-310 |
| 16 November | 320 |

C. SURVEY VESSEL

The NOAA ship WHITING S-329, EDP number 2930, was the only vessel used to gather data for this survey.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

The Hydrographic Data Acquisition and Processing System (HDAPS) was used to collect and process data for survey H-10401. A listing of the program titles and version numbers can be found in Appendix VII. DATA FILED WITH FIELD RECORDS.

The MicroVax program NAVUTL (version 6.0) was used to compare the geographic positions obtained for a platform located in the survey area.

The IBM program NADCON (version 1.01) was used to calculate the datum shift from North American Datum (NAD) 83 to NAD 27 to create overlays for comparisons with prior surveys.

The MicroVax program CALIB (version 2.0) was used to recompute ARGO partial lane correctors using ARGO and Falcon rates recorded during the original calibrations. The recomputation was necessary due to a position error in two of the calibrating network stations.

The HDAPS program RECOMP (version 1.04) was used to recalculate positions by applying recomputed ARGO partial lane correctors.

The HDAPS program POINT (version 2.03) was used to recalculate the position of bottom samples by applying the recomputed ARGO partial lane correctors, which differed from those applied on-line.

All sound velocity corrections were determined using programs CAT (version 1.0) and VELOCITY (version 1.11).

E. SIDE SCAN SONAR EQUIPMENT

An EG&G model 272-T dual-channel towfish was towed at a speed of 5-6 knots from a block attached to an A-frame support on the fantail of WHITING. The operating frequency of the SSS was 100 kHZ, and the range scale was 100 meters port and starboard, resulting in a 200-meter swath width.

Data were recorded by an EG&G model 260 Image Correcting Side Scan Sonar System. The following is a list of SSS equipment serial numbers and dates of use:

| Type | S/N | DOY |
|---|---|---|
| Towfish | 011901 | 268, 278, 309, 310 |
| Towfish | 011904 | 267, 268, 277, 278, 281, 282, 293, 294, 308, 310, 320 |
| 260 Recorder | 0012102 | 267, 268, 276-278, 281, 282, 293, 294, 308, 309, 310 |
| 260 Recorder | 0012106 | 282, 320 |

Sounding lines were offset by 130 to 150 meters to maintain 100% bottom coverage and a swath overlap of 2 millimeters at the scale of the survey. WHITING achieved 100% coverage of the bottom throughout the survey area, and 200% coverage for the investigation of two Automated Wreck and Obstruction Information (AWOIS) items. There is a small holiday in the 200% coverage (100% coverage achieved) for AWOIS item 4155 where WHITING deviated from the survey line to avoid a platform. The depth of water surveyed ranged from 24 to 33 meters.

Confidence checks were performed at least twice daily to confirm the reliability of the side scan trace to the outer limits of the range scale. A trench which ran through the survey area showed up on almost every main-scheme line, providing continuous confidence checks.

Side scan sonar records were examined by WHITING personnel. Data were rejected if the background trace appeared as though it obscured possible contacts. The HDAPS Contact Utility Program used measurements of contacts to compute their position and true height off the bottom. Contacts were considered significant if they had a height of at least 10% of the water depth or a notable shape or pattern.

In accordance with the project instructions, WHITING did not develop or investigate contacts discovered during survey H-10401. This work is scheduled for another ship.

F. SOUNDING EQUIPMENT

A Raytheon Digital Survey Fathometer (DSF) 6000N echo sounder was the only sounding equipment used to determine water depth during the survey. The DSF 6000N produced an analog record of a high frequency (100 Khz) and low frequency (24 Khz) depth. The high and low frequency depths were digitized and then recorded by the HDAPS acquisition system. The high frequency depths were selected as the primary depths.

The only echo sounder used for survey operations was S/N A111N.

In addition to being scanned to check the accuracy of digitized depths, echograms were carefully reviewed for significant features beneath the SSS towfish, none of which were found. Electronics technicians performed daily accuracy checks and preventive maintenance of the DSF 6000N for assurance of data quality.

On DOY 277 fix numbers 730-759 were inadvertently acquired with the DSF 6000N in low frequency (only) digitize mode. The high frequency depths were scaled from the echogram and manually entered into the HDAPS system. The HDAPS program PRIMARY was then used to select the high frequency depths as the primary depths

G. CORRECTIONS TO SOUNDINGS

Six velocity tables were used during survey H-10401. A SEACAT Conductivity, Temperature and Depth (CTD) profiler (s/n 286) was used to collect velocity data. The CTD profiler was last calibrated on January 24, 1991. Calibration coefficients were applied via program VELOCITY. A copy of the calibration report is included in the supplemental cahier submitted with this survey.

A data quality assurance (DQA) check was completed for every cast. The DQA information was obtained by recording the temperature and density of a bucket sample using a thermometer and hydrometer. The temperature and density were then compared to the cast using the DQA subroutine in the CAT program.

CTD casts used for this survey were made on the following days:

| DOY | Vel.Table# | Latitude | Longitude | Depth |
|---|---|---|---|---|
| 255 | 5 | 27°45'06" N | 96°44'54" W | 29.5 m |
| 261 | 6 | 27°45'09" N | 96°45'06" W | 35.3 m |
| 276 | 7 | 27°41'44" N | 96°45'46" W | 28.3 m |
| 289 | 8 | 27°45'06" N | 96°44'54" W | 30.3 m |
| 306 | 9 | 27°49'09" N | 96°48'21" W | 30.2 m |
| 319 | 10 | 27°44'54" N | 96°45'06" W | 36.4 m |

The velocity program picked significant depths to describe the water column sound velocity profile. The resulting correctors were entered into HDAPS velocity tables and applied to the sounding data during acquisition or post processing. The velocity tables are included in Separate IV* and a separate binder of all cast data is included in the supplemental data cahier.

Settlement and Squat was determined on August 5, 1991 (DOY 217), in Corpus Christi Channel, Cut "A" range. Values were determined by making several runs with the ship at various speeds past a mooring platform where an observer with a level was stationed. Level readings of a stadia rod positioned on the ship were recorded on each run. At-rest readings were recorded between each run to eliminate tidal affects. Average correctors were determined for each speed and entered into an HDAPS offset table. The data and computations are included in Separate IV.*

A Heave, Roll, Pitch sensor (HIPPY), S/N 19109-C, was interfaced with HDAPS. The HIPPY output heave, pitch, and roll data to the HDAPS data acquisition computer. All soundings were corrected for vessel heave.

Tidal datum for project OPR-K220-WH was mean lower low water. The operating tide stations at Corpus Christi, Texas (877-5870) and Port Isabel, Texas (877-9770) will be used as control for datum

*DATA FILED WITH FIELD RECORDS.

determination. Verbal contact was made with Mr. Larry Nieson of the Atlantic Operations Group (N/OMA1213), and he confirmed the stations were working properly during the period of survey operations. There were no leveling requirements for this project.

The reference for predicted tides was Galveston, Texas. The following time and height correctors were entered into the HDAPS tide tables and applied during acquisition or post processing:

| Time Correctors | | Height |
|---|---|---|
| High Water | Low Water | Corrector |
| -1 hr 30 min | -1 hr 30 min | x1.28 |

Contours of the preliminary sounding plots revealed discrepancies between soundings of some adjacent survey lines. The application of actual tides is expected to "smooth" contours; however, the effect of steady winds on coastal tides may be different from those experienced at the tide gauge station, which is located well inshore, at the head of Corpus Christi Bay. APPROVED TIDES WERE APPLIED DURING OFFICE PROCESSING.

The static draft correction used throughout the survey was 3.2 meters. This was confirmed by pneumatic depth gauge on October 28, 1991 (DOY 301). The Transducer Depth Determination report is included in Separate IV. DATA FILED WITH FIELD RECORDS.

Several attempted comparisons between a calibrated leadline and the DSF 6000N were unsuccessful due to difficulties in measuring the depth over an extremely soft bottom.

Excellent agreement was found between water depth determined by the DSF 6000N and a 3D Instruments Incorporated, pneumatic gauge (SN 138921-30). The following observations were recorded simultaneously on October 28, 1991 (DOY 301):

| Pneumatic Gauge (feet) | DSF 6000N (meters) |
|---|---|
| 47.4 | 11.2 |
| 47.6 | 11.2 |
| 47.5 | 11.2 |
| 47.4 | 11.2 |
| 47.4 | 11.2 |
| 47.4 | 11.2 |
| 47.4 | 11.2 |
| 47.4 | 11.2 |
| 47.4 | 11.1 |
| 47.4 | 11.2 |
| Average Depth = 47.4 ft | 11.2 m |
| x.3048 | + 3.2 m (WHITING draft) |
| 14.4 m | 14.4 m |

The pneumatic depth gauge measures true water depth. The DSF 6000N measures water depth below the transducer.

The pneumatic gauge was calibrated on February 27, 1991 (DOY 58). Systems checks were completed in accordance with Hydrographic Survey Guideline number 55. These data are included in the Transducer Depth Determination Report. DATA FILED WITH FIELD RECORDS.

Sounding corrections were applied in post processing to the high frequency depths of the DSF 6000N.

H. CONTROL STATIONS SEE ALSO SECTION 1.B. AND 2.A. OF THE EVALUATION REPORT.

All geodetic positions were referenced to the NAD 83.

Six horizontal control stations were used for this survey: three stations were occupied with Falcon Mini-Ranger positioning equipment, and three were occupied with ARGO positioning equipment.

The geographic positions (GP's) of all the stations occupied were surveyed or verified to 3rd order, class I standards. Station descriptions and GP's are included for each site in Appendix III.

Two of the control stations were placed on water tanks. Offsets were computed from the center of the tanks to the rail where the Mini-Ranger RT was secured. The original measurements did not adhere to 3rd order class I standards. Offset positions were re-surveyed to 3rd order class I standards in early September, and the following errors were discovered:

Port Aransas Tank Eccentric (station 205)

| | | |
|---|---|---|
| Initial Position: | 27°49'47.531" N | 97°03'49.421" W |
| Corrected Position: | 27°49'47.566" N | 97°03'49.371" W |

Offset: 1.7 meters

Port Aransas Mustang Tank Eccentric (station 206)

| | | |
|---|---|---|
| Initial Position: | 27°45'06.430" N | 97°07'29.160" W |
| Corrected Position: | 27°45'06.889" N | 97°07'28.929" W |

Offset: 15.3 meters.

These positioning errors affected the crossline and bottom sample data collected on September 9 and 10, 1991 (DOY 252 and 253). The calibrations and their subsequent hydrographic positions were corrected before submission of this survey.

I. HYDROGRAPHIC POSITION CONTROL SEE ALSO SECTIONS 1.b. AND 2.9. OF THE EVALUATION REPORT.

The DM-54 Automatic Ranging Grid Overlay (ARGO) system, operated in the range-range mode, was the primary positioning system used during survey operations. The Falcon Mini-Ranger 484 short range positioning system was used for calibrating the ARGO stations.

The ship's position was determined by the intersection of multiple lines of position from the shore-based stations. Position errors appeared on the track plot as fliers. If reliable positions existed on both sides of the flier, the questionable position was "smoothed" during post processing. HDAPS records included the station codes used for each positioning fix, an error circle radius (ECR), and a maximum residual, which can be used as a measure of how accurate each fix is. Survey data were acquired and plotted at a scale of 1:10,000, but 1:20,000 scale accuracy standards were met (i.e. ECR @ 1.5mm = 30 m and maximum residuals @ 0.5 mm = 10 m).

ARGO positioning equipment included the following:

| Station | RPU | ALU |
|---|---|---|
| WHITING | R1083662 | C1083309 |
| 201 | R047844 | A047853 |
| 202 | R0680312 | A047858 |
| 203 | R1085755 | A0783640 |

Falcon baseline calibrations were performed on July 31 and August 2, 1991 (DOY 212 and 214), at NAVSTA Ingleside, Texas. Baseline calibrations were performed as specified in AMC OPORDER 86 and the Field Procedures Manual 3.1.3.2. The HDAPS system was used to record and process the Falcon range data. Correctors were placed into an HDAPS C-O (computed-observed) table before survey operations began. An abstract of Falcon baseline correctors is included in Separate III. DATA FILED WITH FIELD RECORDS.

Falcon Mini-Ranger 484 positioning equipment included:

| Station | Code | Serial # | RPU | RT |
|---|---|---|---|---|
| WHITING | - | - | D0004 | E2960 |
| 204 | 7 | E2915 | - | - |
| 205 | A | G3571 | - | - |
| 206 | C | F3296 | - | - |

The ARGO positioning system was calibrated at the beginning of each survey leg and whenever the maximum residuals consistently exceeded the tolerance of 0.5 mm at the scale of the survey. The HDAPS primary verses secondary method of calibration was utilized. The ship was positioned at the calibration site with the Falcon

stations set up as the primary positioning system and the ARGO stations as the secondary system. HDAPS provided a comparison of the Falcon position with each ARGO station. ARGO whole and partial lane correctors for each station were displayed on the computer screen. Ten comparisons were obtained by performing a screen dump when the Falcon maximum residuals were less than 10 meters and the signal strengths were 15 or greater. The ARGO whole and partial lane correctors were averaged for the ten observations and applied using the delta range function in the ARGO control display unit. A summary of ARGO partial correctors for the period of survey operations is included in Separate III.*

The ARGO calibrations affected by erroneous positioning of Falcon stations 205 and 206 were recomputed off-line via the Microvax program CALIB. New ARGO partial correctors were computed and the affected data (crosslines and bottom samples) repositioned using the HDAPS programs RECOMP or POINT. Commander Christopher Lawrence, Chief Atlantic Hydrographic section, granted WHITING permission to make the position recomputations. The output listings for the recomputations are included with the survey data.

Offsets for positioning and survey equipment entered into the HDAPS offset table were obtained from historical data and verified. A diagram and table of offsets is included in Separate III.*

Flooding problems during unusually high tides in late September caused ARGO station, GOOSE, to drop off the air. This forced WHITING to run with only two lines of position (LOP's) on the following days:

| DOY | Fix #'s |
|---|---|
| 267 | 150 - 281 |
| 268 | 312 - 426 |

The closing calibration conducted on September 24, 1991 (DOY 267) at 2014Z, differed by 19 meters from the opening calibration conducted on the same day at 1200Z. The difference normally should not exceed 10 meters. WHITING obtained verbal permission from Commander Christopher Lawrence, Chief Atlantic Hydrographic Section, to accept the data and apply average correctors (average of opening and closing calibrations). The data (fix numbers 150 to 281) were repositioned with average correctors using the HDAPS program RECOMP. Output listings from program RECOMP are included with the survey data.

Accuracy requirements were met as specified in the Hydrographic Manual and Field Procedures Manual except as mentioned above. Any records that did not meet the accuracy requirements were rejected and rerun.

*DATA FILED WITH FIELD RECORDS.

J. SHORELINE SEE ALSO SECTION 2. b. OF THE EVALUATION REPORT.

No shoreline existed in the survey area.

K. CROSS-LINES SEE ALSO SECTION 3.9. OF THE EVALUATION REPORT.

A total of 17 nautical miles of crosslines were run on survey H-10401, 8% of the main-scheme lines run. A random sampling of sounding comparisons were within Hydrographic Manual Guidelines. The average difference between crossline and main-scheme soundings was 0.~~1~~ 2 meter. The maximum depth difference was 0.4 meter.

L. JUNCTIONS SEE ALSO SECTION 5. OF THE EVALUATION REPORT.

Survey H-10402 (1:20,000, 1991, sheet "C") lies to the west of H-10401. The junction between these surveys compares well. The average difference between soundings was 0.~~2~~ 1 meter. The maximum difference was 0.4 meter, and contour lines matched well.

Survey H-10399 (1:20,000, 1991, sheet "E") junctions with the northwest corner of survey H-10401. The average difference between soundings was 0.2 meter. The maximum difference was 0.4 meter. Depth curves between the two surveys showed very good agreement.

The northern edge of survey H-10401 is bounded by survey H-10400 (1:20,000, 1991, sheet "H"). The average difference between adjacent soundings was 0.~~1~~ 2 meter. The maximum difference was 0.3 meter. Depth curves between the two surveys showed ~~very~~ good agreement.

M. COMPARISONS WITH PRIOR SURVEYS SEE ALSO SECTION 6. OF THE EVALUATION REPORT.

Survey H-10401 compared well with prior survey D-107 (1:40,000, 1988 - 1989). The average difference between the 96 soundings that were compared was 0.2 meter. The maximum depth difference was 0.7 meter.

Survey H-10401 was also compared to prior survey H-6402 (1:40,000, 1938) and showed good agreement. The average difference between the 39 soundings that were compared was 0.3 meter. The maximum depth difference was 0.9 meter.

N. COMPARISON WITH THE CHART SEE ALSO SECTION 7.9. OF THE EVALUATION REPORT.

Enlargements (1:10,000) of chart 11307 (1:80,000, 31st edition, March 16/91) compared well with survey H-10401. All soundings from the chart were compared with nearby soundings from the survey. The average depth difference was 0.4 meter. The maximum depth difference was 0.7 meter.

Two charted depths from chart 11300 (1:460,732, 29th edition, September 29/90) were compared with soundings from H-10401. Both soundings differed by less than 0.3 meter.

The search radius for AWOIS item 7906, (A CHARTED NON-DANGEROUS SUNKEN WRECK, PA) (unnamed 28-ft pleasure craft reported to have burned to the water line and sunk in the vicinity of 27°45'N, 96°50'W (19.10"N, 53'24.94"W (NAD 83)), is centered on survey H-10399 and overlaps with the western edge of survey H-10401. This area of overlap was investigated with 200% SSS coverage. No significant contacts were recorded in this area. A chart recommendation will be made when H-10399 is submitted. CONCUR

AWOIS item 184 (A CHARTED NON-DANGEROUS SUNKEN WRECK, PA) (fishing vessel TRAMBANA, approximate position reported as 27°42'00"N, 096°50'00"W (NAD 27)) was partially investigated with 200% SSS coverage. The entire search radius was not investigated due to time constraints. No significant contacts were recorded in the area investigated. Since the entire search radius was not investigated, WHITING cannot recommend the removal of the non-dangerous wreck charted for this item. ~~The item investigation should be completed during the upcoming field season.~~ NO CHANGE IN CHARTING IS RECOMMENDED. ADDITIONAL WORK IS RECOMMENDED TO COMPLETE ITEM INVESTIGATION. THE ITEM HAS BEEN ASSIGNED TO THE NOAA SHIP HECK FOR FINAL DISPOSITION.

The entire search radius for AWOIS item 4155 (fishing vessel INEZ G, reported sunk at approximate position 27°43' N, 096°50' W (NAD 27)) was investigated with 200% SSS coverage. The search radius for this item extends north onto survey H-10400 (sheet H, 1:20,000, 1991), but is within the boundaries of the northern field sheet for survey H-10401. To save time, the second 100% coverage for the area that extended onto survey H-10400 was covered during operations on survey H-10401. No significant contacts were found in the area during surveys H-10401 or H-10400. WHITING recommends the non-dangerous wreck charted for this item be removed from the chart. CONCUR

WHITING recommends a diver investigation of one contact found within the search radii for AWOIS items 184 and 4155, contact numbers 12815.~~505~~ and 91393.~~345~~. The two SSS returns were from parallel adjacent survey lines. WHITING noted that the returns were offset from each other by approximately 30 meters. The source of the offset is unknown. The contact has a maximum height of 1.1 meter in surrounding depths of 27 meters, and is not considered significant according to the criteria for significance. However, it is located near a platform, and could be an old anchor from a mooring buoy or debris discarded from a crew boat or the platform. CONCUR SEE ALSO SECTION 7.9. OF THE EVALUATION REPORT.

WHITING found 27 SSS contacts within the survey area, but none were considered significant. Only one contact, described above, is recommended for further investigation* A listing of all SSS contacts is included in Separate V. DATA FILED WITH FIELD RECORDS.
* SEE ALSO SECTION 7.9. OF THE EVALUATION REPORT.

The platform, HHOC-MU-752-A, charted at position 27°42'36" N,

096°51'32" W (chart 11307, 1:80,000, 31st edition, March 16/91), was positioned by WHITING. To position the platform, WHITING ran survey lines in close proximity to the platform, and recorded the ship's position, a visual bearing, and a radar range to the leading edge of the platform abeam. Two observations were obtained, one on either side of the platform. The DIRECT function of program NAVUTL (version 6) was used to compute a position for each observation. The two positions were averaged to obtain a position for the center of the platform. The average position was then compared to the charted position. A rough check of WHITING's average position was obtained by comparison with an average position of 2 SSS returns from the platform.

The difference between the charted position and the WHITING average position was approximately 56 meters. WHITING does not recommend the charted position be changed. At the scale of the chart (1:80,000), 56 meters is less than 1 mm. The supporting data for computation of the platform position can be found in the supplemental data cahier submitted with this survey. SEE ALSO SECTION 1.b. OF THE EVALUATION REPORT.

O. ADEQUACY OF SURVEY

This survey is a complete basic hydrographic survey, adequate to supersede prior surveys of the area. ~~No part of this survey is considered to be substandard~~.

P. AIDS TO NAVIGATION

There were no aids to navigation in the survey area.

Q. STATISTICS

| | |
|---|---|
| Number of Positions | 2954 |
| Nautical Miles of Main-Scheme Sounding Lines | 210 |
| Nautical Miles of Crosslines | 17 |
| Square Nautical Miles Surveyed | 15 |
| Days of Production | 16 |
| Detached Positions | 2 |
| Bottom Samples | 19 |
| Tide Stations | 0 |
| Current Stations | 0 |
| Number of CTD Casts | 6 |
| Magnetic Stations | 0 |

R. MISCELLANEOUS

Nineteen bottom samples were taken in accordance with the project instructions. All samples were submitted to the Smithsonian Institution.

WHITING compared AWOIS coverage soundings with main-scheme soundings and found discrepancies of up to 0.5 meter. These discrepancies may be a result of inaccurate predicted tide correctors. APPROVED TIDES APPLIED DURING OFFICE PROCESSING.

WHITING had problems with pen drags when making swath plots of the northern field sheet. The HDAPS office informed WHITING that the problem was caused by moving fixes that were at the end of a survey line. To solve the problem, swath plots were made by plotting by record number (DSN) instead of fix number.

Many problems and items for improvement were noted for the HDAPS system. A separate memorandum on this subject will be forwarded to the Hydrographic Surveys Branch.

S. RECOMMENDATIONS SEE ALSO SECTION 9. OF THE EVALUATION REPORT.

Some of the copies of prior surveys supplied to the WHITING were not to scale. Careful reproduction, to scale, would greatly facilitate the process of conducting comparisons with prior surveys.

There is considerable field time and logistics involved in setting up and maintaining an ARGO and Falcon positioning network. WHITING could have been more productive if a satellite positioning system were provided. CONCUR

T. REFERRAL TO OTHER REPORTS

The following reports have been or will be submitted as part of OPR-K220-WH.

Horizontal Control Report forwarded to N/CG244 on December 20, 1991.
Electronic Control Report forwarded to N/CG244 on December 20, 1991.
Chart Agent Visit Report forwarded to N/CG33 on November 17, 1991.
Chart User and Evaluation Report forwarded to N/CG243 on December 4, 1991.
Coast Pilot Report will be forwarded.

Submitted By:

Eric W. Berkowitz
Ensign, NOAA

Reviewed By:

Nancy L. Crews
Lieutenant, NOAA
Operations Officer

Approved By:

Richard P. Floyd
Commander, NOAA
Commanding Officer

# Horizontal Control Station Data

| Station No. | Latitude | Longitude | Antenna Elev. (m) | Carto Code | Station Name | Year Established | Seaward of HWL? | Station Source | Quad |
|---|---|---|---|---|---|---|---|---|---|
| 201 | 28/07/31.118 | 096/58/52.429 | N/A | 250 | Goose | 1987 | No | Published | N280954 |
| 202 | 27/47/~~32.060~~ 31.737 | 097/05/13.~~451~~ 309 | N/A | 250 | Sharkys | 1991 | No | Published | N270971* |
| 203 | 28/35/55.276 | 095/58/34.815 | N/A | 250 | Mata | 1991 | No | Published | N270971 |
| 204 | 27/47/33.070 | 097/05/14.862 | 7 | 250 | Knoll | 1934 | No | Published | N280963 |
| 205 | 27/49/47.56~~8~~ 7 | 097/03/49.37~~1~~ 0 | 38 | 250 | Port Aransas Tank Ecc., 1991 | | No | Field Position (3rd Order Class 1) | N270971 |
| 206 | 27/45/06.889 | 097/07/28.929 | 43 | 250 | Port Aransas Mustang Tank Ecc., 1991 | | No | Field Position (3rd Order Class 1) | N270971 |

*QSN is 1040; Other QSN's unavailable

**APPROVAL SHEET**
**HYDROGRAPHIC AND**
**SIDE SCAN SONAR SURVEY**
**OPR-K220-WH-91**
**H-10401**

This combined hydrographic and side scan sonar survey was conducted in accordance with the project instructions for OPR-K220-WH-91, the Hydrographic Manual (through change #3), AMC OPORDERS, Hydrographic Survey Guidelines (through #69), the Side Scan Sonar Manual, and the Field Procedures Manual for Hydrographic Surveying. The survey and reports were completed under daily supervision. All boat sheets and final transmitted sheets were reviewed in their entirety, and all supporting records were checked as well.

This survey is complete for the intended purposes of identifying items requiring further investigation by a different field unit.

Richard P. Floyd, Cdr., NOAA
Commanding Officer
NOAA Ship WHITING

**UNITED STATES DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Rockville, Maryland 20852

# TIDE NOTE FOR HYDROGRAPHIC SURVEY

**DATE:** February 6, 1992

**MARINE CENTER:** Atlantic

**OPR:** K220-WH

**HYDROGRAPHIC SHEET:** H-10401

**LOCALITY:** Gulf of Mexico, Southwest Texas Coast

**TIME PERIOD:** September 9 - November 16, 1991

**TIDE STATION USED:** 877-5870 Corpus Christi (Bob Hall Pier), Texas
Lat. 27° 34.8'N Lon. 97° 13.0'W

**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 20.58 ft.

**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 1.6 ft.

**REMARKS:** RECOMMENDED ZONING

Times and heights are direct on Corpus Christi (Bob Hall Pier), Texas (877-5870).

Note: Times are tabulated in Central Standard Time.

for Edward K. Cummings Jr.
CHIEF, DATUMS SECTION

NOAA FORM 76-155
(11-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

SURVEY NUMBER

H-10401

# GEOGRAPHIC NAMES

| Name on Survey | A ON CHART NO. | B ON PREVIOUS SURVEY NO. | C ON U.S. QUADRANGLE MAPS | D FROM LOCAL INFORMATION | E ON LOCAL MAPS | F P.O. GUIDE OR MAP | G RAND MCNALLY ATLAS | H U.S. LIGHT LIST | K | |
|---|---|---|---|---|---|---|---|---|---|---|
| MEXICO, GULF OF (title) | | | | | | | | | | 1 |
| PORT ARANSAS (title) | | | | | | | | | | 2 |
| TEXAS (title) | | | | | | | | | | 3 |
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| | | | | Charles L. Harrington | | | | | | 16 |
| | | | | Chief Geographer-N/CG2x5 | | | | | | 17 |
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NOAA FORM 76-155 SUPERSEDES C&GS 197

08/23/93

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10401

| | |
|---|---|
| NUMBER OF CONTROL STATIONS | 6 |
| NUMBER OF POSITIONS | 2835 |
| NUMBER OF SOUNDINGS | 20525 |

| | TIME-HOURS | DATE COMPLETED |
|---|---|---|
| PREPROCESSING EXAMINATION | 92 | 05/22/92 |
| VERIFICATION OF FIELD DATA | 156 | 12/09/92 |
| ELECTRONIC DATA PROCESSING | 67 | |
| QUALITY CONTROL CHECKS | 40 | |
| EVALUATION AND ANALYSIS | 32 | 07/12/93 |
| FINAL INSPECTION | 14 | 08/05/93 |
| TOTAL TIME | 401 | |

ATLANTIC HYDROGRAPHIC SECTION APPROVAL 08/23/93

**COAST AND GEODETIC SURVEY**
**ATLANTIC HYDROGRAPHIC SECTION**
**EVALUATION REPORT**

SURVEY NO.: H-10401 FIELD NO.: WH-10-4-91

Texas, Gulf Of Mexico, 14 NM SE of Port Aransas

SURVEYED: 9 September through 16 November 1991

SCALE: 1:20,000 PROJECT NO.: OPR-K220-WH-91

SOUNDINGS: RAYTHEON DSF-6000N Fathometer, EG&G Model 260 Side Scan Sonar

CONTROL: CUBIC WESTERN DM-54 ARGO (Range/Range)

Chief of Party.....R. P. Floyd

Surveyed by.....C. B. Greenawalt
.....N. L. Crews
.....R. A. Fletcher
.....D. E. Bixby
.....K. A. McNitt
.....K. G. Taggart
.....E. W. Berkowitz
.....J. A. Seitz
.....F. R. Cruz
.....E. A. Myers
.....R. L. Harris

Automated Plot by.....XYNETICS 1201 Plotter (AHS)

1. INTRODUCTION

a. This is a combined basic hydrographic/side scan sonar survey. Side scan sonar was operated simultaneously with the fathometer during survey operations. Side scan sonar contacts located by the present survey during hydrographic operations were not investigated by the present survey. In cases where the side scan sonar was used to determine the estimated depth of a feature, the item is shown on the present survey with the upper case letter 'A' in parenthesis. This note is shown on the present survey smooth sheet in proximity to the title block. See also memorandum titled "Showing Estimated Side Scan Sonar Depths on Smooth Sheets", dated 23 February 1989, for an explanation of the note shown on the survey smooth sheet. Depths on these obstructions were estimated by scaling heights off the bottom from side scan sonar records. Positions were determined by computing offsets from the vessel's track.

b. During office processing a problem with the hydrographic position control for this project became apparent. When two adjacent lines of hydrography provided two

positions for the same contact, the positions differed by 30 to 60 meters. Contacts that were noted on one line would not be seen on adjacent lines at the anticipated location. The following situations associated with the ARGO positioning system are probable causes for the contact position irregularities.

Oil platform, HHOC-MU-752-A, did not plot in the same position when located by side scan sonar. The side scan contact positions are approximately 70 to 85 meters from the a published position, listed in the U. S. Coast Guard "OFFSHORE STRUCTURE AND SUBMERGED WELLS", publication. A detached position determined by the present survey was 56 meters from the published position.

The following is a list of irregularities associated with the ARGO positioning system which could have caused the position problem:

1) The site for station MATA was on the mainland. Signal attenuation may have been created by the signal from the station first passing over a body of water, the Intracoastal Waterway, then over a barrier island, and finally back over the water. This situation may have caused resultant range errors.

2) The ground plane for station GOOSE flooded during high tide. This situation may have caused undetectable phase shifts during survey operations.

Atlantic Hydrographic Section personnel thoroughly examined the field data in order to determine the origin and magnitude of the positional error. The discrepancies exist regardless of the factors used in the algorithm used for position computations. Examination of the residuals from multiple line of position (LOP) fixes yielded no evidence of positional problems; however, there were some areas where the geometry for fix computation was poor. A positioning problem exists; however, the exact cause(s) and magnitude could not be determined.

In order to determine the applicability of this survey to the nautical chart the following specifications were considered:

▸ Section 1.2.3. of the HYDROGRAPHIC MANUAL states, "The survey scale is generally twice as large as that of the largest scale chart published or proposed for the area."

► PART A., Section I.1. of the International Hydrographic Bureau (1968) Special Publication 44 states, "The scale adopted should never be smaller than that of the intended chart."

► Section 1.B.1.5 of the International Hydrographic Organization (IHO) Special Publication No. 44, 3rd Edition, 1987, states, "The position of soundings, dangers, and all other significant features should be determined from field observations, relative to shore control, or directly using satellite positioning such that there is a 95 percent probability that the true position, lies within a circle of radius 1.5 mm at the scale of the survey about the determined position."

Considering the specifications quoted from IHO Special Publication No. 44, the maximum allowable error for a 1:20,000 scale survey is 30 meters. Since the maximum positional discrepancy for side scan sonar contacts located by the field unit and shown on the present survey is approximately 50 meters, it is concluded that this survey does not meet the criteria for a 1:20,000 scale survey. Based on this conclusion it is felt that the survey data from this survey is suitable only for charts at scales of 1:40,000 or smaller.

c. Notes in the Descriptive Report were made in red during office processing.

2. CONTROL AND SHORELINE

a. Control is adequately discussed in sections H., I. and T. of the Descriptive Report.

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). Office processing of this survey is based on these values. The smooth sheet has been annotated with ticks showing the computed mean shift between the survey datum and the North American Datum of 1927 (NAD 27).

To place this survey on the NAD 27 datum move the projection lines 1.11 seconds (34.2 meters or 1.71 mm at the scale of the survey) north in latitude, and 0.938 seconds (25.7 meters or 1.28 mm at the scale of the survey) west in longitude.

b. There is no shoreline within the limits of the present survey.

3. HYDROGRAPHY

a. Soundings at crossings are in agreement and comply with the criteria found in sections 4.6.1 and 6.3.4.3. of the HYDROGRAPHIC MANUAL.

b. The standard depth curves were drawn in their entirety.

c. The development of the bottom configuration is considered adequate.

4. CONDITION OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records and reports conform to the requirements of the HYDROGRAPHIC MANUAL, FIELD PROCEDURES MANUAL, and SIDE SCAN SONAR MANUAL.

5. JUNCTIONS

H-10399 (1991) to the northwest
H-10400 (1991) to the north
H-10402 (1991) to the southwest

Standard junctions were effected between the present survey and junctional surveys.

6. COMPARISON WITH PRIOR SURVEYS

a. Hydrographic

H-6402 (1938) 1:40,000
H-6405 (1938) 1:80,000
D-107 (1988-89) 1:40,000

The three prior surveys listed above cover the present survey in its entirety.

Prior survey depths from H-6402 (1938) shows a general trend of being $0^3$ m shoaler than present survey soundings.

Prior survey depths from H-6405 (1938) shows a general trend of being $0^6$ m shoaler than present survey soundings.

Prior survey depths from D-107 (1988), formerly H-10270 1988), show a general trend of being $0^3$ m shoaler than present survey soundings.

The present survey is adequate to supersede the above prior survey depths within the common area. See also section 1.b. of this report.

7. COMPARISON WITH CHART 11300 (29th. Edition, 29 Sept. 1990)
11307 (31st. Edition, 16 March 1991)

a. Hydrography

The charted hydrography originates with the previously discussed prior surveys and requires no further consideration. The hydrographer makes an adequate chart comparison in section N., pages 10-12 of the Descriptive Report. The following should be noted:

AWOIS item #4155, a charted non-dangerous sunken wreck, PA, in Latitude 27°43'01.11"N, Longitude 96°50'00.94"W, originates with Notice to Mariner 52 of 1959 (NM 52/59). Two contacts were located during the present survey operations, and are plotted on the present survey, as discussed below:

| CONTACT # | LATITUDE (N) | LONGITUDE (W) | PLOTTED (M/FT) |
|---|---|---|---|
| 91393 | 27°42'32.50" | 96°51'31.94" | 26 *Obstr (A)*/87 |
| 92815 | 27°42'31.98" | 96°51'30.83" | 26 *Obstr (A)*/85 |

Chart Rep. as

Contact #91393, discovered on the first one hundred percent did not appear at the predicted offset on the second one hundred percent. During ship analysis of the contacts it was determined that the contacts were the same. Because of the position problem discussed in this section both contacts have been plotted. There was a position difference of approximately 30 meters between the two contacts. It is recommended that AWOIS item #4155 be deleted and the obstructions with estimated depths be charted in accordance with Cartographic Order 004/89, dated 3 July 1989. The obstructions have been assigned to the NOAA Ship HECK for final disposition.

The present survey is adequate to supersede currently charted depths on the 1:80,000 scale charts. See also section 1.b. of this report for a discussion on adequacy.

b. Dangers to Navigation

There were no Dangers to Navigation submitted by the field unit on this survey. No dangers were noted during office processing.

8. COMPLIANCE WITH INSTRUCTIONS

This survey complies with the Project Instructions except as noted elsewhere in this report.

9. ADDITIONAL FIELD WORK

This is an adequate basic survey. Additional work is required to verify or disprove items discussed in section N., pages 10-12, of the Descriptive Report. See also section 7.a. of this report for additional work recommendations.

Robert Snow
Cartographic Technician
Verification of Field Data

Norris A. Wike
Cartographer
Evaluation and Analysis

Leroy G. Cram
Supervisory Cartographic Technician
Verification Check

APPROVAL SHEET
H-10401

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the magnetic tape record for this survey. Final control, position, and sounding printouts of the survey have been made. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Leroy G. Cram Date: 08/09/93
Leroy G. Cram
Chief, Hydrographic Processing Team B
Atlantic Hydrographic Section

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Nicholas E. Perugini Date: 08/23/93
Nicholas E. Perugini, LCDR, NOAA
Chief, Atlantic Hydrographic Section

**********

Final Approval:

Approved: J. Austin Yeager Date: 8/8/94
J. Austin Yeager
Rear Admiral, NOAA
Director, Coast and Geodetic Survey

DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Survey
Rockville, Maryland

Hydrographic Index No. 90 C

NOAA FORM 75-96
(10-83)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

MARINE CHART BRANCH

# RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10401

**INSTRUCTIONS**

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

| CHART | DATE | CARTOGRAPHER | REMARKS |
|---|---|---|---|
| 11307 | 9/27/93 | Dan Glenn | ~~Full~~ Part ~~Before~~ After Marine Center Approval Signed Via |
| | | | Drawing No. 42 PARTIAL APPLIC. |
| | | | |
| 11300 | 9/27/93 | Dan Glenn | ~~Full~~ Part ~~Before~~ After Marine Center Approval Signed Via |
| | | | Drawing No. 46 PARTIAL APPLIC. |
| | | | |
| 411 | 2-1-94 | Jerry Schumacher | Full ~~Part~~ Before ~~After~~ Marine Center Approval Signed Via |
| | | | Drawing No. 65 Appd in full - NC 3E AREA |
| | | | |
| 11307 | 8/9/94 | L. Akerman | Full ~~Part Before~~ After Marine Center Approval Signed Via |
| | | | Drawing No. 42 |
| | | | |
| 11300 | 8/10/94 | L. Akerman | Full ~~Part Before~~ After Marine Center Approval Signed Via |
| | | | Drawing No. 47 |
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SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.