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Archaeological Investigation and Remote Operated Vehicle Documentation: Confederate Commerce Raider CSS *Alabama* - 2002

CSS *Alabama* Association
Association CSS *Alabama*
Institute for International Maritime Research, Inc.

April 1, 2004

Archaeological Investigation and Remote Operated Vehicle Documentation: Confederate Commerce Raider CSS *Alabama* 2002

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Submitted to:

Joint French American Scientific Committee for the CSS *Alabama*

Submitted by:

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Abstract

During June and July 2002, the American CSS *Alabama* Association and the French Association CSS *Alabama* carried out an archaeological investigation of the remains of the Confederate commerce raider CSS *Alabama*. Under the direction of Dr. Gordon P. Watts Jr., American and French archaeologists, French volunteer divers and French Navy personnel cooperated in an examination of the wreck that took place between 29 May and 27 July 2002. Underwater archaeological investigation of the wreck site was carried out between 30 May and 21 June 2002. Objectives for the investigation included video and 35mm photographic documentation of both the wreck and underwater research activities. Continued test excavation in a previously tested area aft in the officers' quarters and limited excavation within the hull forward in the crews' quarters was the focus of archaeological investigation. In addition to small "at risk" artifacts, a number of large items including the aft pivot gun, the aft fire suppression pump and the galley stove were identified for possible recovery. At the conclusion of the diving operations, the focus of on-site activity shifted to video and 35mm documentation of the wreck site to generate data for the production of a site mosaic and computer model of the surviving wreck structure. Between 5 and 21 July, a remote operated vehicle (ROV) was employed to conduct that documentation. For the CSS *Alabama* project the ROV was equipped with an acoustic positioning system, a high-resolution digital still camera and an underwater video system. Because funding for the 2002 investigation was not released in time to make sufficient preparations or to obtain and test equipment, a number of the research objectives were compromised. Excavation was frustrated by equipment problems. Artifact recovery, although highlighted by the CSS *Alabama's* bell, was limited to salvage of a random collection of material. Diver and ROV documentation of the exposed vessel remains generated more than 2,000 images. Due to the lack of acoustic positioning for both divers and the ROV and problems with an untested digital camera system, much of the photographic data is of limited value in constructing a comprehensive scaled mosaic. Proposed high-resolution multi-beam imaging of the wreck was not carried out due to weather and other research priorities. Without question, the most important lesson to be learned from the 2002 investigation of the CSS *Alabama* is the liability inherent in attempting to plan, organize, equip and carry out a complex international underwater archaeological investigation without sufficient time and resources.

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1. **Introduction**

The 2002 investigation of CSS *Alabama* was an extension of 18 years of research on the vessel that began with discovery of the wreck site in 1984. Because the wreck of the CSS *Alabama* is jointly managed by the United States and France, the 2002 investigation was authorized by the U. S. Naval Historical Center in Washington, D. C., representing the United States government and the French Ministry of Culture, Paris, representing France. Research objectives were reviewed and approved by both those agencies and the joint American-French Scientific Committee, formed to make management and research recommendations for the CSS *Alabama*. The project was organized and conducted by the Institute for International Maritime Research, Inc., in Washington, North Carolina for the CSS *Alabama* Association, Mobile, Alabama and the French Association CSS *Alabama,* Paris, France.

Research objectives for the 2002 investigation included video and 35mm photographic documentation of the wreck and underwater activities, continued test excavation aft in the officers' quarters and limited excavation within the hull forward in the crews' quarters. In addition to small "at risk" artifacts, a number of large items including the aft pivot gun, the aft fire suppression pump and the galley stove were slated for recovery. Following completion of diving operations, the focus of on-site activity shifted to video and 35mm documentation of the wreck. A remote operated vehicle (ROV) was employed to conduct that documentation. The ROV operation was to generate data for the production of a geo-referenced site mosaic and computer model of the surviving wreck structure. High-resolution multi-beam imaging of the wreck was included in the research design but was not carried out due to weather.

On-site research activities took place between 29 May and 27 July 2002. Archaeological investigation of the wreck was carried out by American and French archaeologists, French volunteer divers and French Navy personnel between 30 May and 21 June 2002. American archaeologists Gordon P. Watts, Jr., John W. Morris III, Mark Padover, Jason Burns, Ken Merriman, Curtis Deyo and French volunteer Jean Loup worked from the American flag vessel *Enrica*. French volunteers, under the direction of Joe Guesnon, worked from the French flag vessel *Little Pocket*. French Navy divers from the Cherbourg Groupe de Plongeurs Demineurs (GPD) operated from the one of several vedettes and the *Vulcain*. ROV operations were carried out by James. Schmidt from the Naval Historical Center, Dana Lynn and William Lewis from the Naval Surface Warfare Center, Carderock Division and Gordon Watts and Mark Padover from IIMR. The British flag vessel *Genesis* served as the surface support platform for ROV operations.

This report document was prepared by Gordon P. Watts, Jr., with able assistance from Raymond Tubby and Robin Arnold.

2. Project Background and Previous Research

Personnel aboard the French Navy mine hunter *La Circe* discovered the wreck of the Confederate commerce raider CSS *Alabama* in 1984. At the request of the French Navy, Captain Max Guérout examined the data and material collected by *La Circe* and began to collect historical documentation regarding the CSS *Alabama*. His research confirmed that the wreck located by *La Circe* was indeed the Confederate commerce raider. Announcement of the location of the CSS *Alabama* led to diplomatic negotiation between France and the United States that subsequently resulted in an executive agreement concerning ownership and management of the wreck. The Executive Agreement of 3 October 1989 also established the framework for authorization and supervision of scientific investigation of the Confederate vessel. Guérout's research and identification of the wreck as the CSS *Alabama* also led to the creation of the French non-profit Association CSS *Alabama*. As a consequence of requests to continue on-site research, France as the territorial power of the wreck site and the United States of America as the owner of the wreck and its associated artifacts, jointly authorized the Association CSS *Alabama* to undertake additional investigations at the wreck site in 1988 (Guérout 1994).

The 1988 investigation of the CSS *Alabama* was organized around a cadre of volunteer divers, archaeologists and historians working in conjunction with Captain Guérout. Location of *Alabama*'s wheel, with the ship's motto "Aide-toi et Dieu t'aidera" provided absolute identification of the wreck (Figure 1). Data from the 1988 expedition facilitated the development of plans for volunteer diver supported research projects conducted by the Association CSS *Alabama* in 1989, 1990, 1991, 1992, 1993, 1994, 1995 and 1996. Captain Guérout served as Principal Investigator and each investigation was authorized according to the terms of the 1989 Executive Agreement. Funding for the research carried out between 1988 and 1996 was raised almost entirely in France. Those investigations resulted in a complex plan of the wreck (Figure 2) and the recovery of an important collection of approximately 200 objects, including: the wheel, several flushing toilets with transfer-printed ceramic bowls, and a variety of plates, glasses, salt cellars, and other galley and tableware, deck tracks for the vessel's ordnance trucks, a pivot carriage and a heavy Blakely rifled cannon (Guérout 1994).

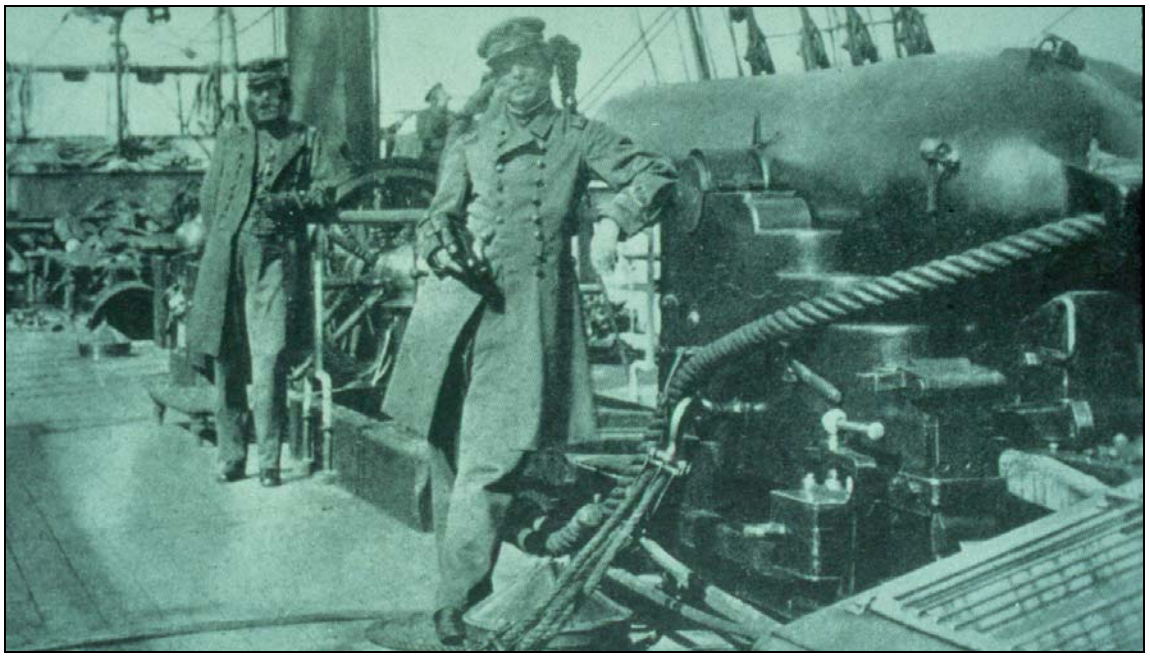

Figure 1. Semmes and Kell stand forward of the *Alabama*'s wheel and next to the 8-inch aft pivot gun.

In 1999, after a two-year hiatus in field research, investigation of the wreck resumed under the joint sponsorship of the French Association CSS *Alabama* and a newly formed American organization, the American Association of the Friends of CSS *Alabama*. Principal funding for the project was provided by grants from the U. S. Department of Defense Legacy Resource Management Program. Those funds were channeled through the American Association of the Friends of CSS *Alabama*. The Alabama Power Foundation, the City and County of Mobile, Alabama, members of the Association of the Friends of CSS *Alabama* and the City of Cherbourg, France, provided additional funding. Gordon Watts served as project principal investigator.

Objectives for the 1999 reconnaissance investigation focused on determining if significant changes in the surviving wreck structure, machinery or associated archaeological record had occurred since the last on-site investigation in 1995. In addition to making those observations, the research team employed underwater video and 35mm photography to document elements of the vessel's structure, machinery, fittings, ordnance and artifacts exposed on the seabed. During the 1999 investigation, a small diver propulsion vehicle was employed to remove the highly mobile layer of shell hash that covers more stable sediments containing the undisturbed archaeological record. Three specific locations were selected for testing. The first was in the stern at the base of the screw and lifting frame to determine if the frame was still attached to the hull. The second was in the bow aft of the stem to

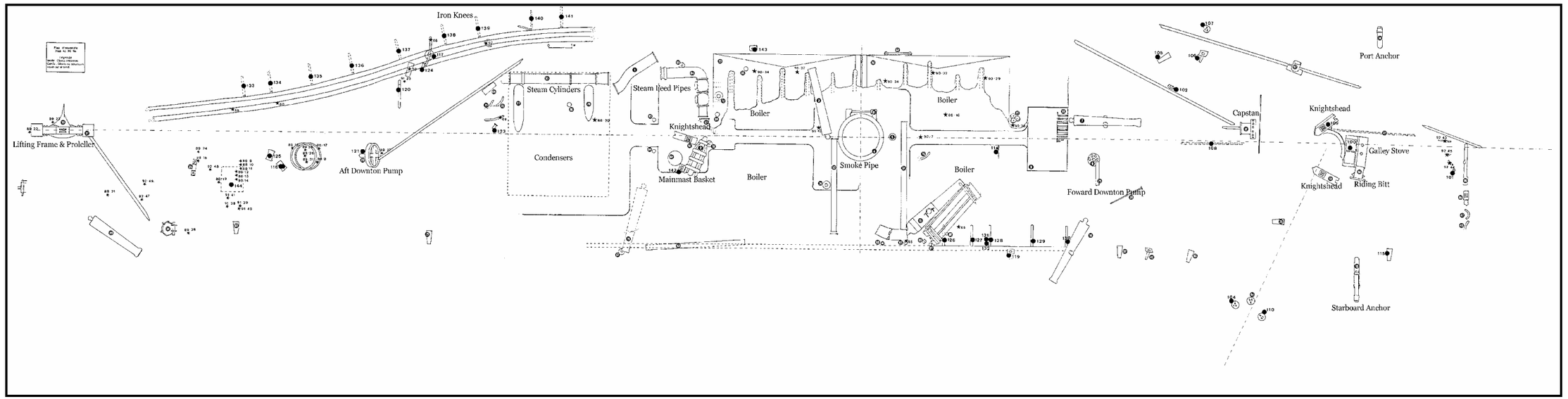

Figure 2. CSS *Alabama* Site Plan (Guérout 1994).

determine how much of the hull structure survives forward and determine if material associated with the forecastle was exposed. The third area chosen for removal of shell hash was the location of the second pivot gun to determine if the truck structure survived in association with the tube. Although the 1999 investigation was limited to two days of on-site activity, observations confirmed that no dramatic changes occurred in the condition of the aft section of the wreck. Exposed features appeared to have been relatively stable with a nominal amount of upper level bottom material migration. The investigation reinforced the conclusion that additional resources would be essential if research on the wreck site was to be intensified (Watts 1999).

In 2000, the American Association of the Friends of CSS *Alabama* and the Naval Historical Center entered into a Memorandum of Agreement with the Institute for International Maritime Research, Inc. (IIMR), a Washington, North Carolina based 501 (c) (3) corporation to plan, organize and conduct the field research. Under the terms of that agreement, IIMR planned, organized and supervised research at the wreck site during the summers of 2000, 2001 and 2002. Dr. Gordon P. Watts, Jr., served as the Principal Investigator for those operations. Funding for the 2000, 2001 and 2002 projects was provided by additional grants from the U. S. Department of Defense Legacy Resource Management Project. Those funds were appropriated by Congress and channeled through the Naval Historical Center to the American Association of the Friends of CSS *Alabama*. The Alabama Power Foundation, the City and County of Mobile, Alabama, members of the Association of the Friends of CSS *Alabama* and the City of Cherbourg, France, provided additional funding for the projects. Dive equipment used by American archaeologists was generously donated to IIMR by Scubapro, Inc. (Watts 2000).

Based on the 1999 reconnaissance, a more complex investigation of the CSS *Alabama* was organized for the summer of 2000. Objectives for the 2000 investigation ultimately focused on documentation of the wreck site using underwater video, continuation of test excavation previously carried out within the surviving hull in the stern and recovery of selected artifacts. The video data generated was used to test new electronic methods of digital mosaic construction (Figure 3). Limited test excavations were also undertaken within the hull aft, at the base of the propeller and at the location of the stern pivot gun. Excavation was also to be undertaken at the site of the aft fire pump and the starboard Trotman patent anchor. In addition to recovering artifacts and data that would shed light on life aboard the CSS *Alabama*, the test excavation was designed to generate information on the nature and scope of the archaeological record within the surviving hull structure. Although weather and equipment problems complicated on-site research activity, the investigation generated new information about the wreck and additional insight into conducting work on the site (Watts 2000).

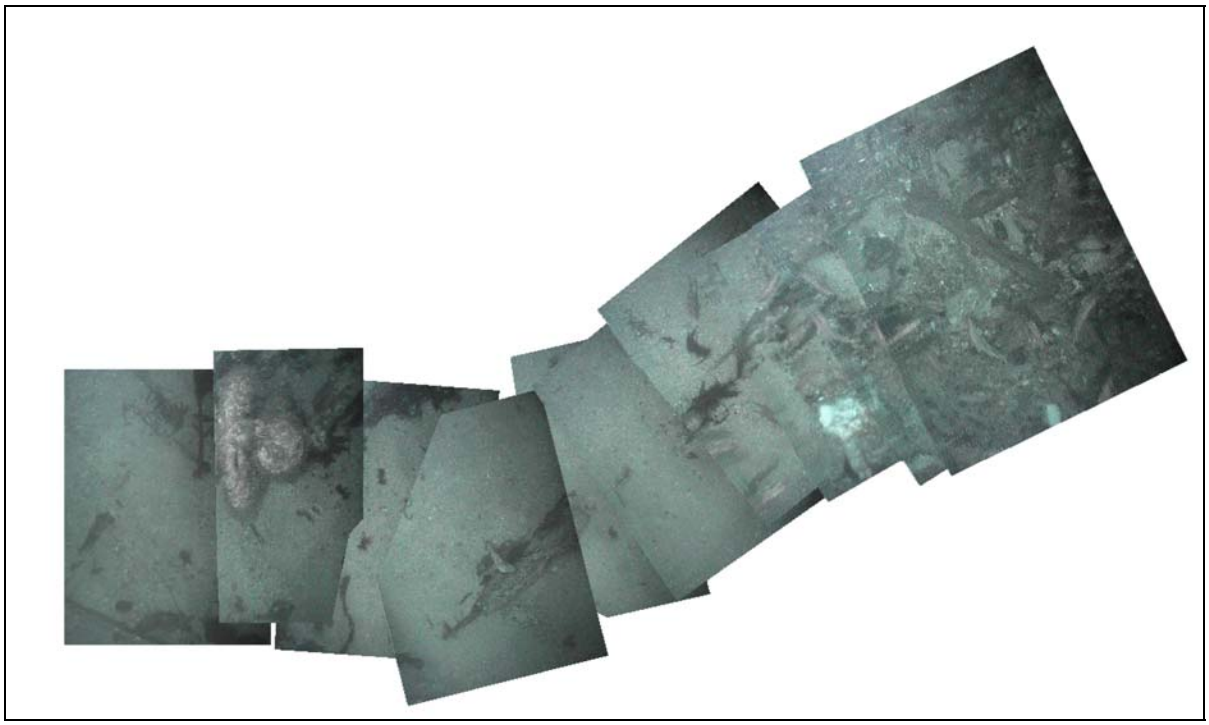

Figure 3. Example of a test mosaic from 2000 diver collected digital images. Images begin at the aft Downton pump (left) and continue to the aft coal bunker.

Investigation of the CSS *Alabama,* during the summer of 2001, was a continuation of previous research and management priorities. On-site operations focused on documentation of the exposed wreck structure, test excavation in the hull aft and recovery of selected and "at risk" artifacts. Documentation of the wreck structure was to have been based on use of the U. S. Navy research submarine *NR-1* and a U. S. Navy ROV. Unfortunately, authorization for use of the *NR-1* and ROV could not be obtained from the French government and the primary research objective had to be abandoned. Without data from the proposed *NR-1* and ROV surveys, the focus of on-site activity was shifted to excavation and artifact recovery. A test excavation in the stern produced a number of interesting artifacts and new information concerning the nature, scope and degree of preservation of the archaeological record within the CSS *Alabama*'s surviving hull structure. Efforts to recover the aft pump were again suspended until a better understanding of the methods of attachment could be determined (Watts 2001). With assistance from the French Navy, one of the CSS *Alabama*'s two Blakely patent British Royal Navy pattern 32-pounders was recovered (Figure 4).

Figure 4. Recovery of one of the British Royal Navy pattern 32-pounders during the 2001 investigation of CSS *Alabama*.

3. CSS *Alabama* Project Authorization

The remains of the CSS *Alabama* are the property of the United States of America. Management of the wreck is the responsibility of the Naval Historical Center in Washington, D. C. Because the wreck lies in French territorial waters it also falls under the administrative authority of that nation's Ministry of Culture. By mutual agreement between the United States and France, all on-site research activity requires authorization from both the Naval Historical Center and the French Ministry of Culture (Appendix A). The 2002 investigation of the CSS *Alabama* was performed according to the terms of authorizations from both the Naval Historical Center and the French Ministry of Culture. The joint American-French Scientific Committee, formed to make management and research recommendations for the CSS *Alabama*, reviewed and approved the project research design (Appendix B).

4. CSS *Alabama* Project Organization and Administration

The 2002 investigation of the CSS *Alabama* was organized and conducted by the United States CSS *Alabama* Association and the French Association CSS *Alabama.* Under the direction of President Ulane Bonnel, the French Association CSS *Alabama* obtained all necessary permits for on-site research from the Ministry of Culture and all required authorizations from naval and civilian authorities in Cherbourg. The Association CSS *Alabama* also negotiated use of the Cherbourg Natation Plongee (CNP) dive boat and facilities, coordinated the activities of the French volunteer divers and the surface assistance personnel and arranged insurance for the boat and all operational personnel, including the American archaeologists. The French Association CSS *Alabama* also negotiated the participation of French Navy personnel and surface support vessels (Appendix C).

The CSS *Alabama* Association, under the direction of President Robert Edington of Mobile, Alabama, obtained funding from the Department of Defense Legacy Resource Management Program and privately donated funds to support the 2002 research project. The CSS *Alabama* Association also coordinated activities in the United States and supported the production of a newsletter to make project research activities public. That organization entered into an agreement with the Naval Historical Center and the IIMR to carry out the 2002 investigation. Under that Memorandum of Agreement, IIMR worked in conjunction with the French and American associations and the Naval Historical Center, to plan, organize and conduct on-site research. In compliance with the report requirements of the Naval Historical Center and the Ministry of Culture, IIMR personnel also prepared this report on 2002 project activity.

5. Location and Description of the CSS *Alabama* Wreck Site

Wreckage of the CSS *Alabama* lies in La Manche off the Normandy Peninsula (Figure 5). The site is approximately 5.5 miles (8.9 km) offshore of Nacqueville and 6 miles (9.7 km) north-northeast of Fort de L'Ouest on the Cherbourg outer breakwater. [Location information is removed from circulation copies of this report].

The remains of the *Alabama* lie in approximately 61 meters (200 feet) of water. That depth makes work at the site both complex and hazardous. Water temperatures rise to approximately 50 degrees Fahrenheit (10°C) in the summer. Visibility at the site ranges from virtually zero to approximately 100 feet (30 m).

(LOCATION INFORMATION PROVIDED IN THIS FIGURE – FIGURE REMOVED FROM PUBLIC REPORT / CIRCULATION COPY)

Figure 5. Location of the CSS *Alabama* wreck site and restricted diving zone.

During the tidal cycle, currents flowing over the wreck site can exceed four knots. In addition to restricting on-site research activity, currents have had an important effect on the wreck. The *Alabama* lies on a hard bottom consisting of rocks, pebbles, shell hash and sand (Figure 6). That environment limited scour settling of the hull. With the exception of sand and shell deposited within and around the wreck, most of the vessel structure remained exposed to the water column elements. That highly dynamic water column environment contributed to the deterioration of virtually all exposed structural remains. During the life of the project, more than a meter of bottom surface sediments, mostly shell hash, have been observed to migrate rapidly away from the wreck and return. In this highly abrasive environment, the *Alabama*'s exposed hull remains, already weakened by biological activity, have deteriorated to the approximate level of the stable bottom surface below the shell hash.

Figure 6. Sample of bottom surface sediment at the CSS *Alabama* wreck site.

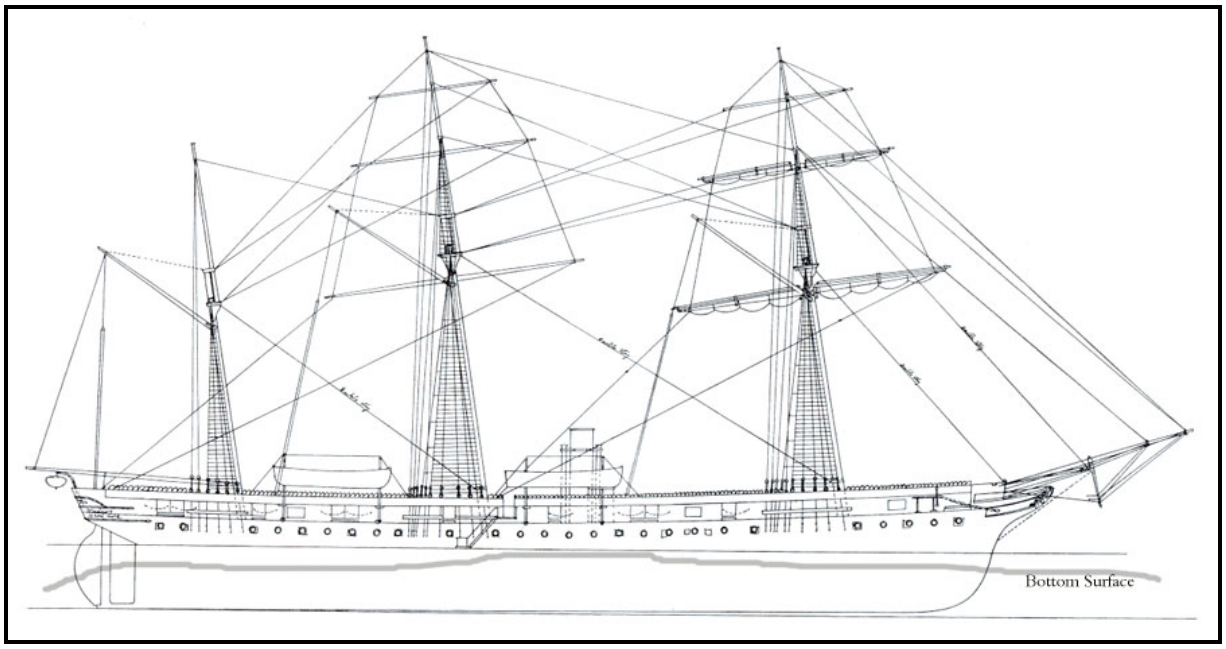

Figure 7. Projection of surviving hull remains plotted over drawing of the CSS *Alabama* by Andrew Bowcock.

Only the unexposed lower hull and amidships portions of the starboard side of the *Alabama* survive intact. The hull lists approximately 30 degrees to starboard and is oriented perpendicular to the prevailing current pattern. Depth measurements taken by the divers using a submersible, precision depth recorder confirm that sediment consisting of shell hash, pebbles and sand has accumulated within and around the *Alabama* to a depth of almost three meters (Figure 7). The major accumulation of material is amidships and is probably a result of the *Alabama*'s machinery and boilers. Amidships, the port side of the hull is exposed to the approximate position of the turn of the bilge while the starboard side could survive to the approximate location of the lower deck clamp. Toward the stern, the depth of sediment rapidly decreases to the approximate level of the propeller shaft. At the stern, a little less than half of the propeller is exposed along with the top of the brass frame that lifted it clear of the water. No evidence of the stem was observed, which made it difficult to determine the amount of sediment accumulation forward. It is also possible that the hull may not lie on an even keel fore and aft and the amount of surviving structure is considerably less (Figure 8). Very little of the surviving hull structure is exposed at the site.

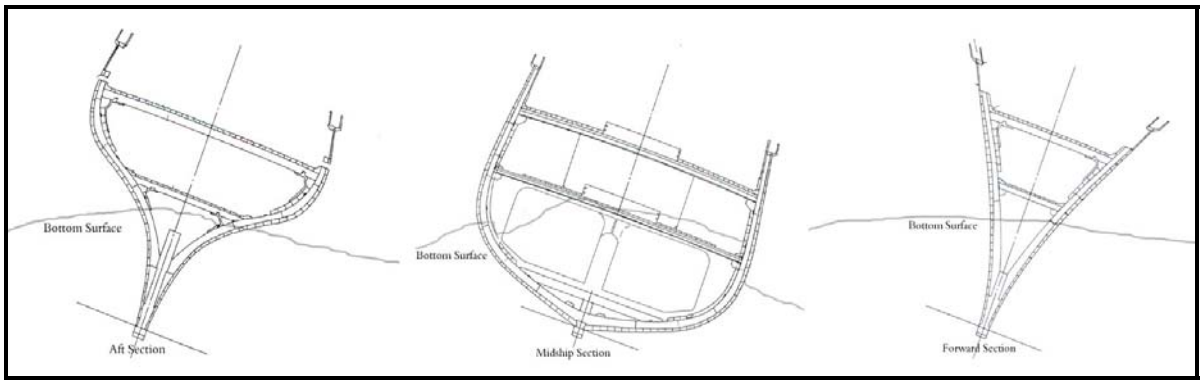

Figure 8. Projection of surviving hull structure beneath bottom sediment plotted over hull sections drawn by Andrew Bowcock.

The exposed remains of the CSS *Alabama* are characterized by a combination of features associated with the vessel structure, machinery, fittings and ordnance. Elements of the hull and machinery remain in much the same condition as they were found, when on-site examination of the wreck was begun in 1984. However, over 300 artifacts have been recovered. While most are small, several pieces of ordnance and a riding bitt represented significant features on the site. Their positions on the wreck have been included in the narrative description of the site and the site plan developed by Max Guérout.

5.1 Hull Structure

The *Alabama*'s stern is identified by the lifting frame and propeller, which mark the northern extremity of the site. Immediately aft of the lifting frame, the head of the rudder is exposed above the sediment. Wood structure identified during the 2002 investigation suggests that some portion of the *Alabama*'s fantail are also preserved below the sediment accumulated aft of the hull structure.

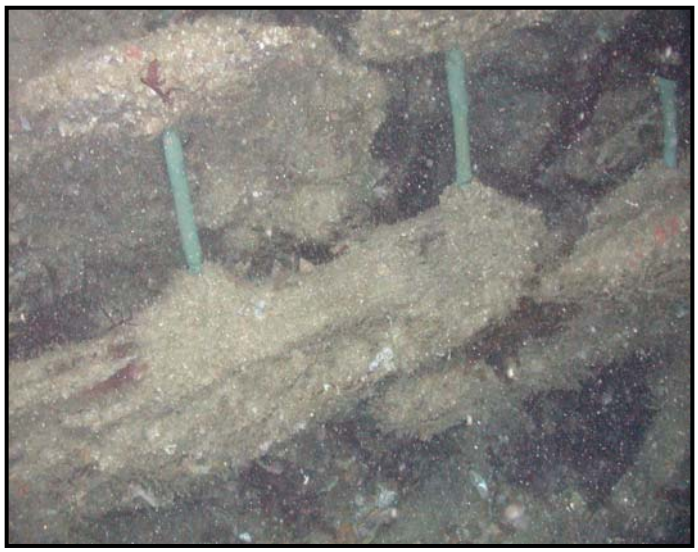

Figure 9. Exposed hull remains on the port quarter forward of the lifting frame.

Forward of the lifting frame and propeller, the port side of the hull is defined by exposed frames, planking and ceiling (Figure 9). Although sporadically covered by migrating

Figure 10. Iron knee attached to port deck clamp.

sediment, the lower port side of the hull extends from the sternpost to a point aft of the bow near the present location of the capstan. In the stern aft of the steam machinery a section of the port side lies buried outside the hull. Heavy iron knees extend up through the sediment to mark its position (Figure 10). On the starboard side accumulated sediment has covered most of the hull. From a point immediately forward of the steam machinery to a point adjacent to the forward Downton pump, the hull is exposed from one to three feet above the bottom surface. At the base of the starboard Trotman anchor, additional structure is exposed and confirms that the surviving hull remains extend well beyond the boilers but is completely buried. A rabbeted timber, identified as the stem, was exposed in 1992 but has not been observed more recently. During the 2001 and 2002 investigations, a small section of ceiling planking and frames was exposed on the starboard side of the hull immediately outboard and aft of the test excavation location. That section of the structure contained two valves associated with through-hull fittings.

5.2 Steam Propulsion Machinery

Much of the *Alabama*'s steam machinery is accessible. The two steam cylinders lie athwartships, just inside the lower hull aft of the boilers. Both cylinder heads, their beds and associated valve chests are exposed (Figure 11). A large steam pipe from the aft face of the aft boilers extends aft across the outboard ends of the cylinders (Figure 12). Debris and sediment cover the center of the engines and both of the condensers located to starboard.

Figure 11. Forward steam cylinder head.

Figure 12. Main steam feed pipe from boilers.

Figure 13. Forward port boiler firebox .

Forward of the steam engines, the outboard sides of two of the *Alabama*'s four boilers are exposed. Each of the port boilers is rectangular with a longitudinally rounded upper and lower shell. The lower outboard forward face of the forward boiler is exposed to the point that one of the firebox doors is periodically visible (Figure 13). The top of the port boilers are obscured by collapsed iron deck structure but the flues that connected them to the single smoke pipe are partially exposed (Figure 14). The starboard boilers are covered by sediment and debris from the iron decks above them. The base of the retractable smoke pipe that was centered between the four boilers extends approximately six feet into the water column (Figure 15). Forward of the smoke pipe an 8-inch copper steam blow off pipe that served the forward boilers remains standing. Aft of the smoke pipe a section of the 8-inch copper steam blow off pipe that served the aft boilers lies on the bottom athwartships. Although the shaft tunnel and propeller shaft are covered by sediment, the propeller and the frame that lifted it out of the water are partially exposed at the stern (Figure 16).

5.3 Machinery and Fittings

A number of pieces of the *Alabama*'s machinery and fittings associated with operation of the vessel are also exposed. Two Downton pumps were installed to dewater the bilges and fight fires. Along the centerline of the hull and forward

Figure 14. Crushed flues that connect the boilers to a common smoke pipe.

Figure 15. Smoke pipe and forward steam blow off pipe.

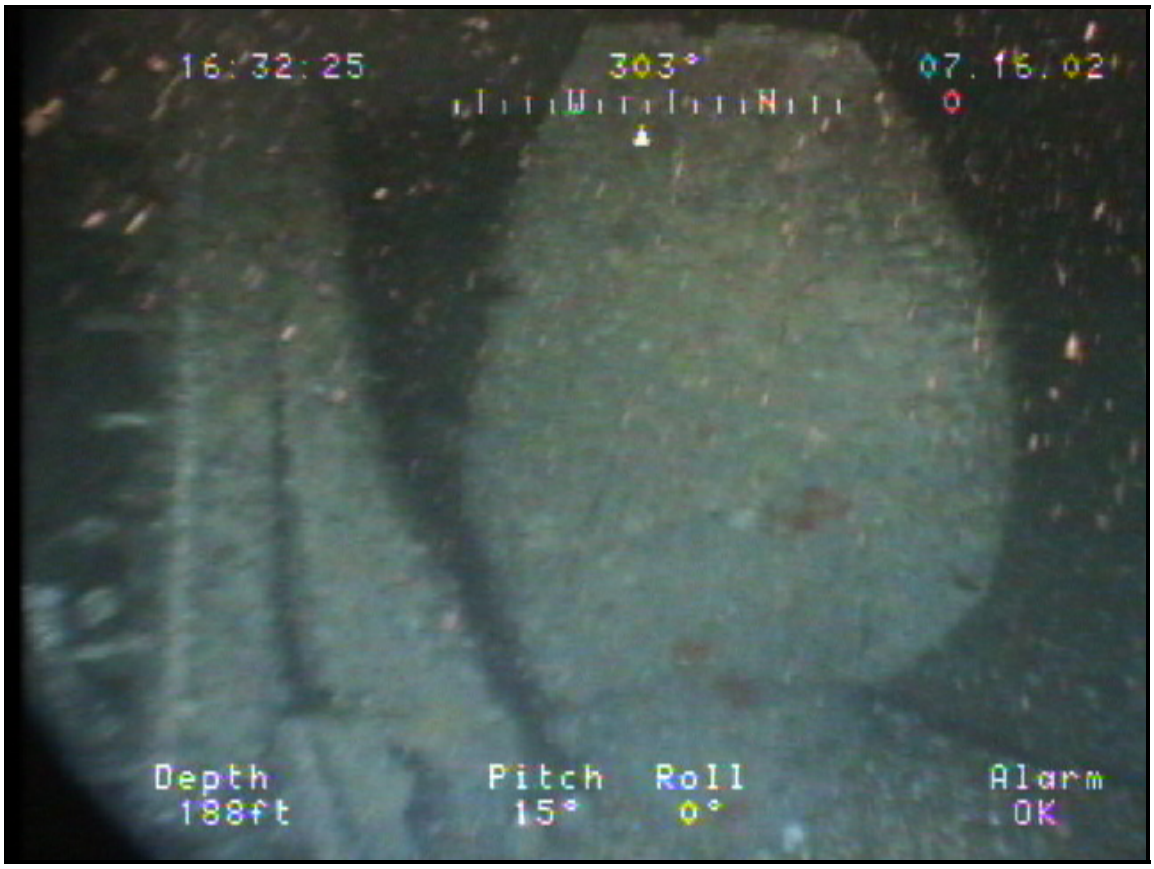

Figure 16. Lifting frame and propeller.

of the location where the remains of the ship's wheel were found in 1988, the aft Downton pump survives intact (Figure 17). The base of the pump remains plumbed to a valve chest that provided several options for source water. A fire nozzle with intact leather hose was recovered from the base of the pump in 2001. The second Downton was mounted forward of the boilers. Although the pump was intact as late as 1995, it appears to have been damaged by trawling or anchoring and the wheel was found broken in 2002 (Figure 18). The base of the pump appears to remain connected to its valve chest.

Frontward of the forward coal bunkers, an iron capstan is exposed on the bottom (Figure 19). Anchor chain stretches forward toward one of the large cast iron riding bitts, that was mounted on deck near the foremast (Figure 20). Just aft of the riding bitt, two knights from the foremast fife rail were found. Both knights were fitted with brass knightheads and fairleads for three internal sheaves (Figure 21). A third knight with similar fairleads and sheaves was found near the base of the mainmast between the aft boilers and the engines. Smaller, less obvious port lights with lead

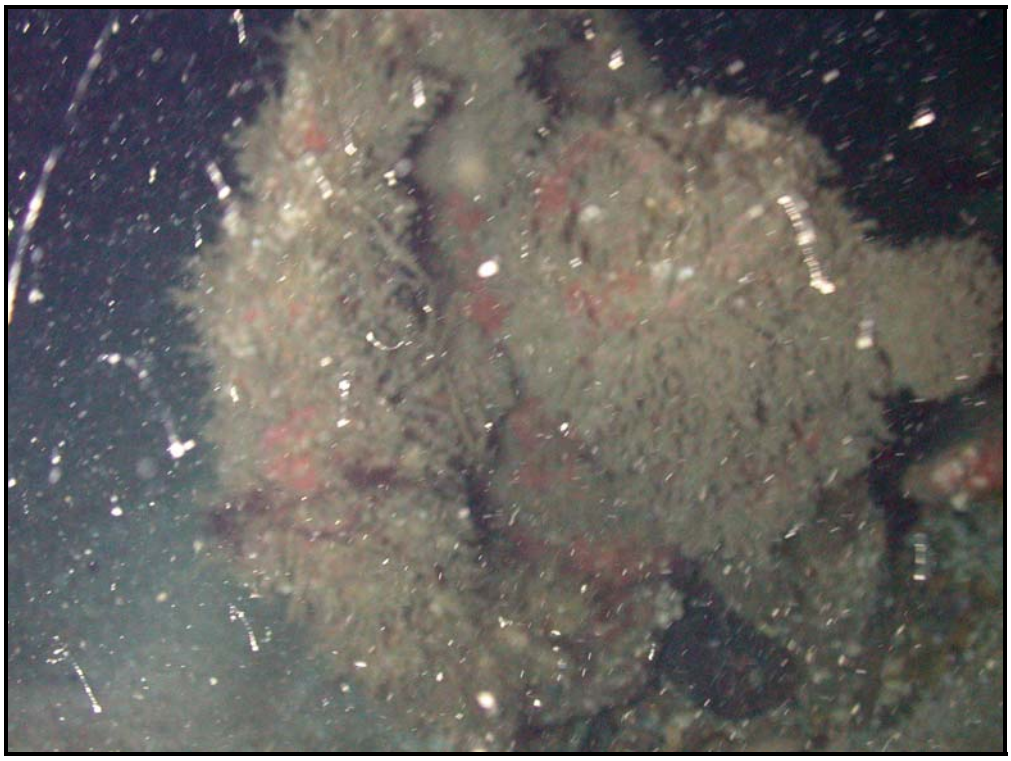

Figure 17. Aft Downton pump.

Figure 18. Damaged forward Downton pump.

Figure 19. Top of the capstan.

Figure 20. Iron riding bitt.

sheathing were scattered along both sides of the hull, fore and aft of the engineering space. Just forward of the foremast fife rail pillars and to port of the cast iron riding bitt, the galley stove lay on the bottom almost entirely exposed (Figure 22). Because the *Alabama*'s main mast was stepped between the aft boilers, the base of the mast was fitted into an iron basket forged atop a long iron pillar. The ironwork at the base of the mast was resistant to the often, intense heat in the engineering space between the boilers. The basket that fit atop the pillar lies between the aft boilers and the engines (Figure 23).

Figure 21. One of the foremast knightheads.

5.4 Ground Tackle

The *Alabama*'s ground tackle was comprised of Trotman patent anchors. The starboard Trotman was apparently catted when the commerce raider sank. It now protrudes upside down from the bottom immediately outboard of the surviving hull structure. The crown juts approximately five feet into the water column and the arms are perpendicular to the hull (Figure 24). Only one arm and fluke of the port Trotman is exposed on the opposite side of the hull (Figure 25). Lying adjacent to

Figure 22. Face of the galley stove.

Figure 23. Iron basket for the foot of the main mast.

Figure 24. Starboard Trotman anchor.

the galley stove are the nested arms of two additional Trotman anchors (Figure 26). The shanks and stocks were apparently stowed separately to conserve space. As needed, they could be quickly brought on deck and assembled.

5.5 Ordnance

The CSS *Alabama* was to be fitted with eight pieces of ordnance in the Azores. Six of those pieces were 32-pounder smooth bores. Seven cannon have been identified at the wreck site. Two of the cannon were cast from a British Royal Navy pattern (Figure 27) and three were of a more modern pattern (Figures 28 and 29) produced by Fawcett, Preston and Company in Liverpool. A Blakely Patent 7-inch 100-pounder rifle was mounted on a pivot carriage forward (Figure 29) and a 68-pounder smoothbore was similarly mounted aft (Figure 28). One of the Blakely Patent 32-pounders was found lying across the starboard side of the hull forward of the boilers. A second Blakely Patent 32-pounder was identified outside the hull structure, immediately forward of the propeller and lifting frame. The forward Blakely Patent 32-pounder was recovered in 2000. Both of the British Royal Navy pattern 32-pounders have also been identified. One lies inside the hull starboard and forward of the boilers and adjacent to the forward Downton pump. A second was identified on the iron deck structure immediately aft of the smoke pipe. The

Figure 25. Fluke of the port Trotman anchor.

Figure 26. Flukes of two disassembled Trotman anchors near stove.

Royal Navy Pattern 32-pounder aft of the smoke pipe was recovered in 2001. The remaining 32-pounder has not been positively identified, but could be underneath hull debris forward of the starboard Trotman anchor.

The 7-inch 100-pounder rifle lay on top of the forward starboard boiler beside its pivot carriage. The 100-pounder rifle was the first cannon recovered from the CSS *Alabama*. It, and the pivot carriage were brought up in 1994. The 68-pounder smoothbore carried aft on a pivot carriage was located immediately outside the starboard hull structure in the stern. It is possible that the remains of the truck and pivot carriage lie underneath the gun tube.

In addition to the seven cannon, the site contained shot, gun truck wheels and brass tracks for the gun carriages. Many of the brass tracks have been recovered. Two shot have been recovered. One conical projectile was inside the barrel of the 7-inch rifle. A shell for a 32-pounder was recovered from the stern forward of the propeller. That shot was attached to a wood sabot and had been packed in a wood box for storage. Additional round shot have been observed forward of the boilers and in the vicinity of the aft pivot gun, one possibly from USS *Kearsarge* (Figure 30).

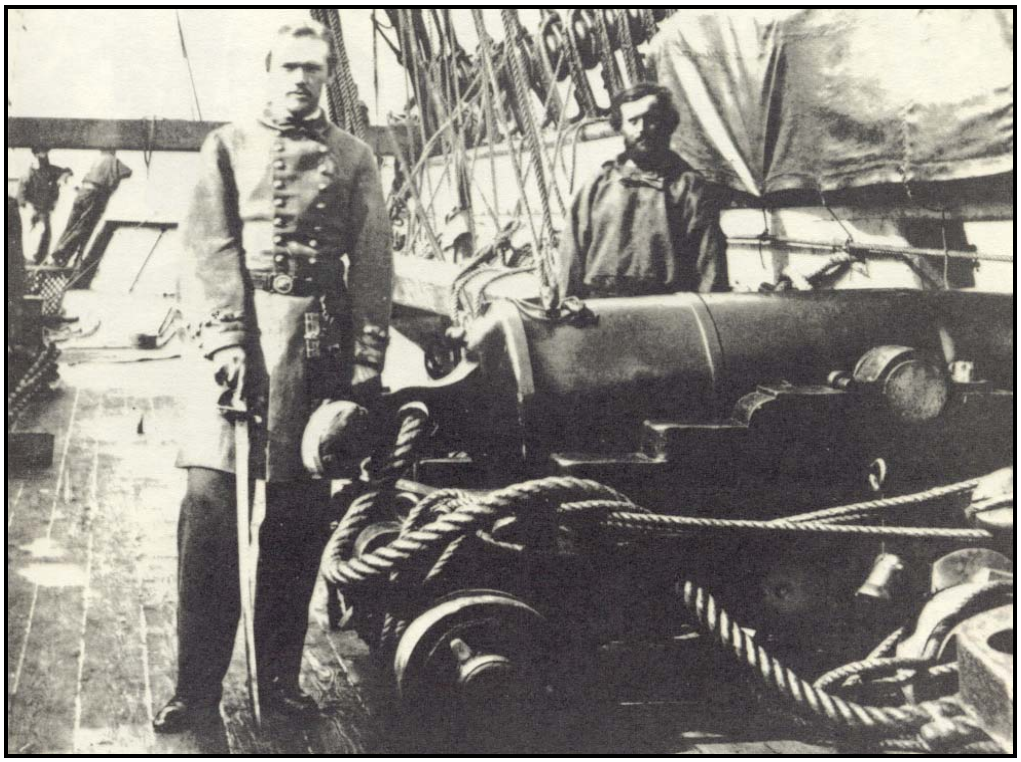

Figure 27. British Royal Navy pattern 32-pounder on *Alabama*'s starboard bow.

Figure 28. Kell at the aft pivot gun and a Fawcett, Preston and Company 32-pounder on the port quarter.

Figure 29. Breech of 100-pounder pivot rifle and muzzle of Fawcett Preston and Company 32-pounder beyond open companionway hatch.

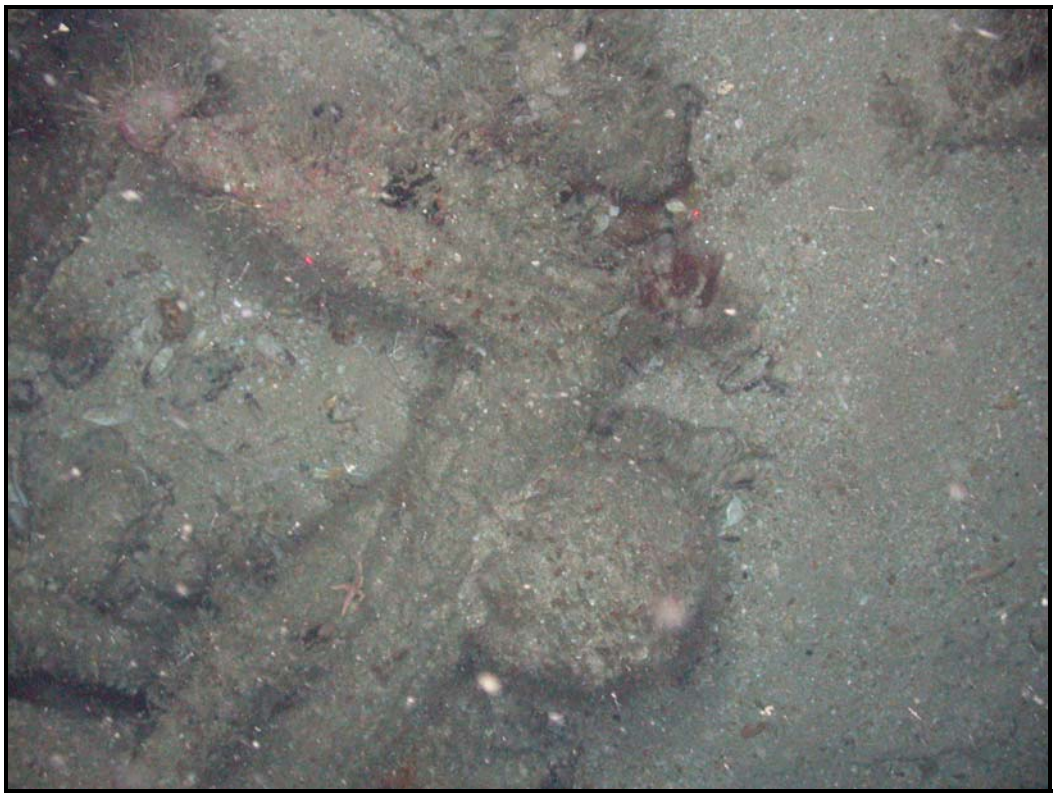

Figure 30. Round shot or shell lying adjacent to an iron knee.

6. 2002 Project Objectives

Objectives for the 2002 CSS *Alabama* Project were focused on continued excavation and recovery of material associated with the ship and documentation of the exposed wreck structure. In order to make the most efficient use of personnel and equipment, three periods of on-site operations were originally proposed. The first was to be dedicated to the ROV survey. The second period would be dedicated to recovery of the aft pivot gun, the Downton pump and to initiate test excavation. The third period would be dedicated entirely to complete excavation in the stern that was begun in 2001 and to carry out a second test excavation forward in the area of the crews' quarters. Due to scheduling priorities for the ROV, those phases had to be reversed and budget limitations dictated a single period of diving operations.

6.1 Archaeological Objectives

On-site objectives for the diving operations in 2002 were designed around continued excavation within the surviving hull structure, recovery of several large artifacts and recovery of small "at risk" artifacts exposed on the seabed. Objectives also included

underwater video documentation of the wreck structure and research activity and sufficient testing to support a strategy to recover the lifting frame and screw. The highest priority was placed on the continuation of test excavations within the hull structure. Evidence from the initial efforts to excavate within the hull in 1995 and 2001 demonstrated the complex nature of the archaeological record that survives below the bottom surface. In 2001, compressor powered airlifts were employed to expose and recover a diverse collection of cultural material associated with life aboard the Confederate commerce raider. That excavation was to be continued until the lower hull structure was exposed. Material exposed during the excavation was to be documented with video and mapped using Aqua Metre, a short baseline acoustic mapping system developed in France by PLSM (Appendix D).

In addition, airlifts were to be employed in the area of the bow where the crew of the CSS *Alabama* was quartered. That area of the wreck has not been tested. However, based on evidence from excavation in the stern, a similar degree of material preservation was anticipated. Data from the ROV survey was to have been used to determine the exact location for the forward excavation. As in the stern excavation, exposed material was to be documented with video and mapped using the Aqua Metre short baseline acoustic mapping system.

Recovery of several large artifacts had been identified as an objective in several previous research plans. Those artifacts included the aft pivot gun, the aft Downton pump, the galley stove, the starboard Trotman patent anchor and the lifting frame and screw. Recovery of several large artifacts was identified as a secondary objective in 2002. The focus of available attention was directed on the aft pivot gun, the Downton pump and the galley stove. Recovery of the aft pivot gun would complete the collection of ordnance types from the CSS *Alabama* and permit comprehensive analysis of the ship's battery. Recovery of the Downton pump would provide insight into the technology utilized to support a commerce raider designed to be entirely self sufficient at sea for indefinite periods and provide insight into the preservation of machinery recovered from the wreck site. Recovery of the galley stove would shed additional light on preservation and life aboard the commerce raider. Material in and around the stove could possibly reveal specifics about the nature of meals and their preparation.

In anticipation of ultimately recovering the *Alabama*'s lifting frame and screw, additional excavation was proposed to help determine whether the frame was still attached to the hull. Nominal efforts had previously been made to expose the lower elements of the lifting frame and screw without success. Using more powerful airlifts and more dedicated time, another attempt would be made to expose those elements of the vessel's machinery.

To facilitate more comprehensive documentation of the wreck structure, the Aqua Metre short baseline acoustic mapping system was also proposed for use in determining the exact position of the wreck site features previously described. Using key points inside the smoke pipe, on the lifting frame and on the starboard Trotman anchor as a baseline, the acoustic system was to be used to plot features such as the machinery, ordnance, hull structure and exposed artifacts.

Work designed to accomplish those objectives was to be carried out by a combined team of professional American archaeologists and volunteer French divers. Due to the fact that simultaneous excavation was planned in the bow and the stern, the number of staff archaeologists was to be increased to eight. That would permit teams of archaeologists to supervise every aspect of on-site activity and ensure adequate documentation. As has been the case in the past, underwater video cameras would be employed to document each phase of the proposed research. A professional photographer was to be on the project staff so that archaeological personnel would not have to divide their attention between archaeology and documentation of the work activity. In addition, a staff position would be dedicated to on-board vessel operations so that archaeological personnel need not be employed for that purpose.

French volunteer divers would assist in the conduct of excavations. They would also identify, locate and recover "at risk" artifacts and help with mapping using the acoustic positioning system. French Navy divers would assist with the recovery of "at risk" artifacts and make all of the heavy lifts associated with bringing up the aft pivot gun, the Downton pump and possibly the galley stove. The Aqua Metre short baseline acoustic positioning system was to be employed in identifying the position of recovered artifacts.

To support the proposed research, a larger American dive vessel was to be obtained and fitted out with an improved air compressor system (Appendix D). For safer and more productive dive operations, mixed gas would be used by the American archaeologists.

6.2 ROV Documentation Objectives

Because previous efforts to collect sufficient photographic documentation to support production of a mosaic of the *Alabama* wreck site proved to be difficult using divers, an ROV based operation was planned for 2002. ROV documentation was designed to generate sufficient data to support production of a precise positioning controlled digital wreck site mosaic.

To control positioning, an electronic grid was to be established on the wreck by acoustic reference beacons placed on the site by the ROV or divers. Tentative beacon locations were the lifting screw frame at the stern, the smoke pipe amidships and the starboard anchor located near the bow. To be useful the acoustic positioning had to provide sub-meter real time accuracy and be tied to a computer ROV navigation system such as Hypack Max on the surface support vessel. The objective of sub-meter real time positioning was to ensure complete systematic photographic coverage with sufficient image overlap to facilitate mosaicing. ROV altitude would be maintained by both a precision depth recorder and/or intersecting lasers. The approximate bottom surface area to be covered by the ROV was calculated to be an area approximately 300 feet by 150 feet.

To collect digital images of the wreck site, the ROV was to be equipped with a 3.1 megapixel high-resolution digital still camera. A digital underwater video camera must also be aboard for continuous visual observation. High intensity color corrected lights mounted on the ROV would provide illumination. To minimize reflection problems with water column turbidity those lights would be mounted as far apart as possible. The digital still camera system was to be uploadable to the surface with the ROV in the water to maximize documentation time. The surface support vessel was to have facilities for recording the digital video signal. Both the underwater digital still and video cameras were to be equipped with lenses corrected to eliminate image distortion (Appendix D).

The wreck site was to be documented from two elevations. Though the exact elevations would be determined based on a combination of camera, lens and lighting capabilities, balanced with visibility and time constraints, the most detailed documentation should be from an altitude no greater than six feet. The second level of documentation would be from an altitude approximately 10 feet above the bottom surface. Additional documentation of features such as the lifting screw, smoke pipe and anchors would require more specific attention to ensure that their images can be accurately placed in the mosaic.

To enhance navigation, the ROV would be capable of carrying a Reson 8125 Sea Bat Ultra High Resolution Focused Multibeam Echosounder System (Appendix D). The Sea Bat system could be effectively used to develop a highly detailed three-dimensional AutoCAD based image of the wreck site. That AutoCAD image could be used in conjunction with the digital mosaic. Plans called for draping the mosaic image over the Sea Bat image to develop a highly detailed three-dimensional computer model of the exposed wreckage.

Due to depth, current and bottom conditions that are not ideal for anchoring, ROV operations would have to be carried out from a surface support vessel maintaining

dynamic station over the wreck (Appendix D). The ROV was to have sufficient power to systematically navigate over the wreck site in currents reaching two knots and be able to collect sufficient data to make operations economically realistic (Appendix D).

6.3 Budget Reductions and Funding Availability

Although plans for the 2002 operations called for a dramatic change in the nature and scope of on-site research, cuts in the proposed budget and failure of the DOD Legacy Resource Management Program to release the funds in time to make effective preparations compromised both the operations and the objectives. Project personnel could not be notified that the 2002 operation would be attempted until the last minute. That eliminated some of the staff and any possibility of training or preparation dives for those that could participate. Plans for use of mixed gas had to be cancelled as training could not be scheduled, and gas could not be ordered in time to be delivered in Cherbourg. Likewise, equipment could not be obtained or fabricated, and tested prior to shipping for France.

The most critical system, a compressor that was to power four dredges, could not be obtained on short notice. An effort to adapt the system used in 2001 was not completed until 20 hours before the deadline to deliver the research vessel to Charleston, South Carolina. The failure of that system to function as anticipated crippled all efforts to carry out the proposed test excavations. The Aqua Metre short baseline acoustic positioning system could not be leased due to budget cuts and insufficient time to schedule the equipment. Similar problems impacted the ROV operations. The most critical involved the camera and positioning systems. Neither could be obtained in time for installation and testing. In spite of the best efforts of project personnel, both systems failed to provide adequate support for the operation.

The delay and reduction in funding also eliminated the possibility of obtaining a larger surface support vessel. Cuts in the proposed budget forced reduction of on-site operations from three periods of investigation to two. That ultimately permitted only 19 days of dive operations and 10 days of ROV operations (Appendix E).

7. 2002 On-Site Project Research

Ultimately, the 2002 investigation of the CSS *Alabama* was divided into two distinct operations. In June, the focus of research was on diver documentation, excavation and artifact recovery. That activity was carried out by a team of American

archaeologists, French archaeologists and volunteer divers and divers from the French Navy. In July, operations shifted to photographic data collection based on use of an ROV from the Carderock Division of the Naval Surface Warfare Center. Using their Phantom ROV (Appendix D), personnel from the Naval Historical Center, the Naval Surface Warfare Center and IIMR collected digital videotape and photographic images of the wreck site to support production of a comprehensive scaled mosaic of exposed vessel remains and artifacts of the bottom surface.

7.1 2002 Archaeological Diving Operations

Dive operations were ultimately scheduled during two periods of lower tidal coefficients in May and June. The first period of work at the site was scheduled between 30 May and 9 June. In spite of generally bad weather, diving operations were carried out on 9 of 11 days. The second period of on-site research was scheduled between 15 and 21 June. Weather during the second period was much improved and diving operations were carried out every day.

On-site operations began by relocating the wreck and placing mooring buoys on the wreck. As there were three groups diving at the same time, moorings were set on the 32-pounder cannon nearest the lifting frame and screw, the starboard Trotman anchor and on the starboard side of the steam machinery. To facilitate navigation on the wreck site, a baseline was deployed from the lifting frame to the smoke pipe and forward to the starboard Trotman anchor. Divers from the GPD and French volunteer group accomplished that work between 30 May and 1 June. French Navy personnel operated from the lift vessel *Vulcain* (Figure 31) and one of several 60-foot (18 m) vedettes (Figure 32). With the exception of several days when the vessel was unavailable, French volunteers dove from the CNP vessel *Little Pocket* (Figure 33).

Figure 31. The French Navy vessel *Vulcain*.

Figure 32. One of the GPD vedettes.

Figure 33. CNP Dive vessel *Little Pocket.*

Following resolution of logistical problems that delayed arrival of the American flag dive support vessel *Enrica* and all project equipment shipped from the United States (Figure 34), project archaeologists began to deploy equipment at the site. Hoses to power airlifts were attached to the 32-pounder mooring in the stern and two 6-inch airlifts were secured on the wreck site. To control excavation and documentation during excavation, two-meter-square grids were set up in the stern between the lifting frame and the fire pump (Figure 35).

Figure 34. American flag dive support vessel *Enrica* moored at the site.

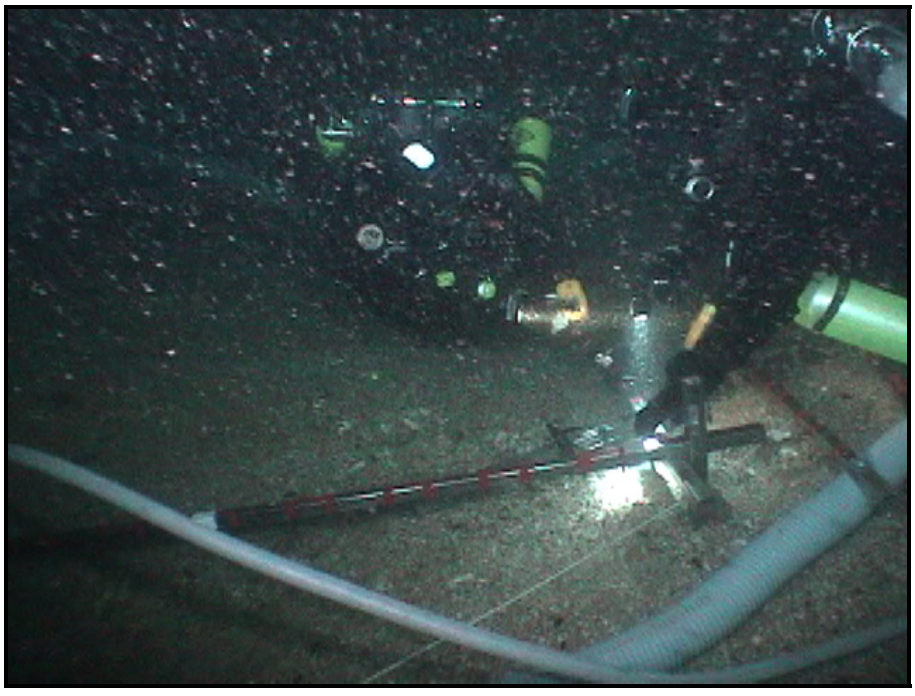

Figure 35. Setting up excavation grid in the stern.

With the grids assembled and positioned, the first attempt at excavation was made on 4 June. Excavation was to be carried out using airlifts powered by a rotary compressor aboard the American research vessel *Enrica* (Figure 36). The compressor was powered by a hydraulic system attached to the *Enrica*'s diesel engine. That design eliminated the more dangerous gasoline engine that took up most of the space on the *Enrica*'s aft deck. Unfortunately, virtually every component of the new and untested compressor system failed during the project. Due to the lack of time to assemble and test the compressor prior to the initiation of fieldwork those failures ultimately eliminated any possibility of conducting the proposed excavation in the stern. Archaeologists spent much of every day during the first dive period attempting to repair and redesign the system and invaluable research time was lost.

Figure 36. Loading air compressor.

While an inordinate amount of time was spent attempting to rectify problems with the compressor system, the French volunteers and French Navy divers were able to relocate the aft pivot gun and the galley stove (Figure 37). In addition, their attempts to locate artifacts exposed on the bottom surface proved successful. As work on the site progressed, a variety artifacts were identified for recovery. After video documentation and triangulation, those that were exposed and "at risk" were brought to the surface. While divers recovered larger artifacts individually, small items were brought to the surface using plastic crates with partitions that isolated and protected each artifact. Aboard the *Little Pocket*, fragile material was transported back to Cherbourg in containers filled with seawater. A number of small fittings, fasteners, glass vessels and tableware were retrieved before rising tidal coefficients brought an end to the first period of diving.

During the first period of on-site activity, a digital video camera in an underwater housing was used to record the exposed wreck structure and underwater activity. Video was used to document the on-site activity and provide illustrations for reports and publications. Video documentation of the wreck structure was designed to provide images of diagnostic features, material being cleared for recovery and image data to experiment with mosaic construction software. Documentation of the underwater work provided a graphic record of research and *in situ* images of artifacts before recovery.

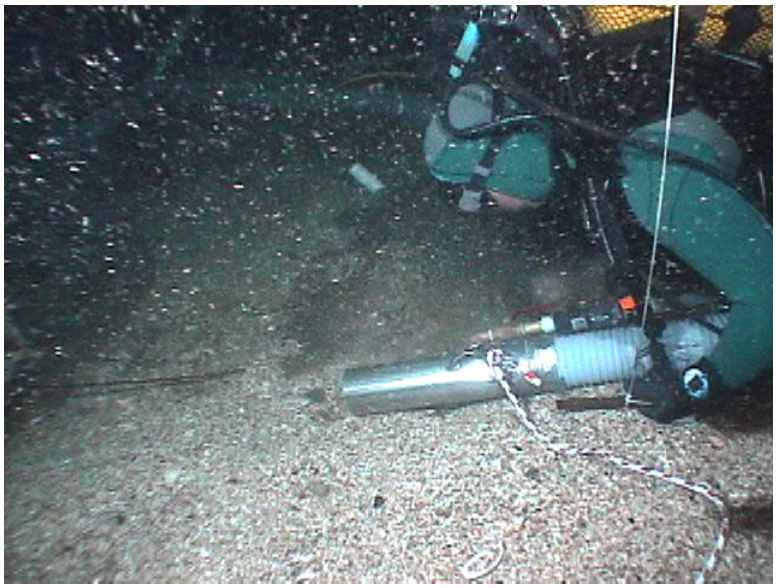

Figure 37. Exposing the aft pivot gun.

In the interim between diving periods, work on the compressor system continued on a daily basis. Plans for the second period of diving were revised to compensate for the complications associated with equipment problems. Artifacts recovered during the first phase were cleaned, photographed and catalogued at the CNP facilities (Figure 38). That aspect of the project was carried out under the direction of French conservator Elise Blouet (Appendix F). As time permitted, several trips were made to Grandcamp Maisey to meet with NHC and NSWC personnel to plan for the ROV operations scheduled for July.

The second period of on-site research was scheduled between 15 and 21 June. Weather during the second period was much improved and diving operations were carried out every day. The revised plan of operations focused on continued efforts to conduct excavations in the stern and to attempt to clear sediment away from the base of the galley stove near the bow. In the stern airlifts powered by the rebuilt compressor would be used for excavation. In the bow French Navy divers would use large compressed air cylinders to power their airlift.

Figure 38. Artifact documentation.

On the first dive, conditions on the bottom were found to have changed dramatically. During the period while tidal coefficients were too high for on-site operations almost a meter of additional shell hash had been deposited inside the

hull in the stern. The excavation grids were completely covered and both airlifts had to be dug out by hand. Hose for the airlifts was fouled and partially buried. Once those problems had been solved, attempts to excavate resumed.

The second attempt to excavate proved as unsuccessful as the first. Each attempt was frustrated by the successive failure of components of the compressor system. Every failure caused the loss of a day of on-site activity. Ultimately, every available opportunity to carry out the proposed excavation was lost. In the bow, compressed air cylinders provided nominal dredge performance. Diver propulsion vehicles were used to help move shell hash away from the base of the galley stove. In the stern they provided the power to wash shell hash away from the pivot gun.

During the second period of operations, French volunteers and French Navy divers recovered additional artifacts from the wreck. While most were exposed on the seabed, some were uncovered during efforts to clear shell hash away from the galley stove. Material recovered during the second period included a large iron riding bitt, additional fittings, gun truck tackle, parts of small arms, glass and tableware and the ship's bell. The bell and its ornate mounting bracket, the riding bitt, Enfield rifle fragments and parts of a shoe were recovered near the galley stove. During the last two days of work at the site, excavation and mapping equipment was recovered and the baseline and moorings were removed.

Figure 39. Loading artifacts for shipment to conservation facilities in Charleston, SC.

Following the second period of on-site investigation, the *Enrica* was loaded for shipping and equipment was broken down, cleaned and packed for shipment back to the United States. Artifacts were cleaned, photographed and catalogued. All recovered material was packaged in a watertight container for shipment to the Warren Lasch conservation facilities in Charleston, South Carolina (Figure 39).

7.2 2002 ROV Operations

Although ROV operations were scheduled to begin on 28 June, weather prevented the research vessel *Genesis* from making the passage from Grandcamp-Maisy to Cherbourg until 5 July (Figure 40). On the following day, ideal weather permitted the first on-site operations (Appendix E). The wreck site was relocated using DGPS and a fathometer and the position was marked on a bridge display. When the current dropped sufficiently, the ROV was launched upstream of the wreck (Figure 41). Scanning sonar on the ROV was used to drive the underwater vehicle to the wreck site (Figure 42). Although the navigation system failed to function, about 45 minutes of video and photographic documentation were recorded before currents became too strong for the ROV to maintain position (Figure 43). On the following day, similar operations generated another hour of video and photographic records without positioning data. On 8 July, the weather deteriorated and launch and recovery of the ROV was determined to be too hazardous to attempt. Similar conditions eliminated operations on 9 July, and the *Genesis* returned to Grandcamp-Maisy that afternoon.

Figure 40. R/V *Genesis* departing the harbor at Cherbourg.

During the period from 10 through 15 July, the *Genesis* remained at Grandcamp-Maisy. That permitted review and duplication of the first two days of data. Review of the data confirmed that problems associated with the lack of positioning were compounded by difficulties with the 35mm digital camera. Because funding for the project was delayed, the camera had been obtained at the last minute. The lens proved to be unsuitable for the operation making focusing a factor of the ROV elevation above the bottom. Camera recovery time after each shot was slow compounding the difficulty in achieving sufficient overlap. Those problems were additionally complicated by a delay between triggering each shot and the camera firing. Due to problems with the positioning system and complications associated with focusing and firing the digital camera, priorities for the second phase of ROV operations were shifted from systematic documentation of the wreck site to feature specific documentation. Specific wreck features were prioritized for documentation, but current and visibility dictated some reorganization of objectives.

ROV operations resumed on 16 July and continued through 21 July. With the exception of two days lost to weather, feature documentation operations were carried out every day. The majority of that activity was focused on forward sections of the wreck due to the difficulties associated with coordinated station keeping of the *Genesis* and navigation of the ROV. While most of the documentation focused on selected elements of the wreck structure, features of opportunity were also recorded. In all, approximately 2,000 images and 15 hours of videotape were generated by the investigation. While positioning was never functional and many images are out of focus, the data provides new and useful information about the wreck.

Figure 41. Launching NSWC ROV.

Following completion of all fieldwork, artifacts recovered during the 2002 campaign were packaged for shipment to conservation facilities in Charleston, South Carolina. A special iron container with a watertight liner constructed for shipping one of the

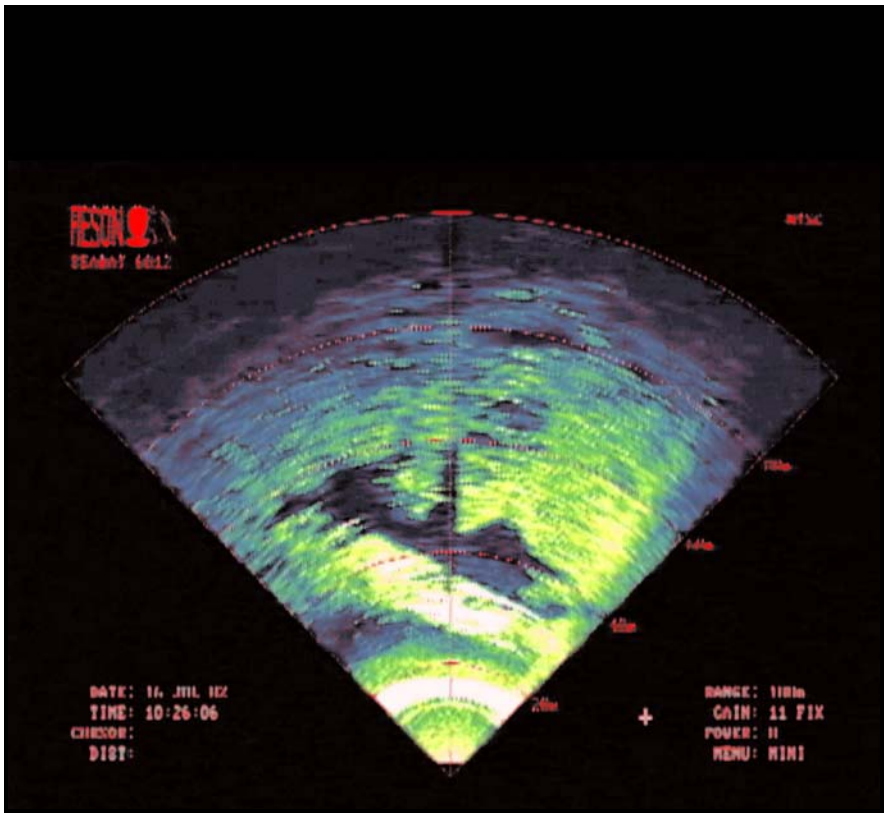

Figure 42. ROV sonar image of the wreck site.

Figure 43. ROV operations in progress aboard the R/V *Genesis*.

Alabama's 32-pounders to Charleston, South Carolina in 2001 was used for the artifacts. Using a local crane service the riding bitt was lifted from Cherbourg harbor and placed in the shipping container (Figure 44). Conservator Elise Blouet packed the small artifacts, and they were also placed inside the water-filled shipping crate. That crate and the diving and excavation equipment were loaded in a 20-foot metal shipping container for transport to the United States.

Figure 44. Loading the iron riding bitt.

After the shipping container arrived in Norfolk, Virginia and was released by United States Customs, it was delivered to the Institute for International Maritime Research, Inc., in Washington, North Carolina. There, the equipment was unloaded for cleaning and storage. The artifacts were also unpacked and documented. A three-dimensional AutoCAD image of the *Alabama*'s bell was developed and additional photographs were taken of every item except the riding bitt. Once that work was completed, the artifacts were repackaged and delivered to the Warren Lasch Conservation Center in Charleston, South Carolina. There they were evaluated and a portion of the collection was shipped to the Texas A&M conservation laboratory in College Station, Texas for conservation.

8. Description of the Artifacts

Material recovered during the 2002 investigation of the CSS *Alabama* consisted almost entirely of artifacts exposed on the bottom surface and a few artifacts exposed by test excavation in the vicinity of the galley stove. Due to the dynamic environment at the wreck site, artifacts exposed on the bottom surface are considered to be at risk and their provenience is questionable. Damage to the forward Downton pump and nets fouled on the wreck structure provide an indication that some of the damage has been caused by trawling (Figure 45). Recovery has been accepted as the most appropriate method of ensuring the preservation of exposed material. During the 2002 campaign, a total of 19 artifacts

were recovered. They included the bell, small arms, ceramics, glass, ship fittings, gun carriage tackle, fragments of the vessel's hull and one of the *Alabama*'s two cast iron riding bitts.

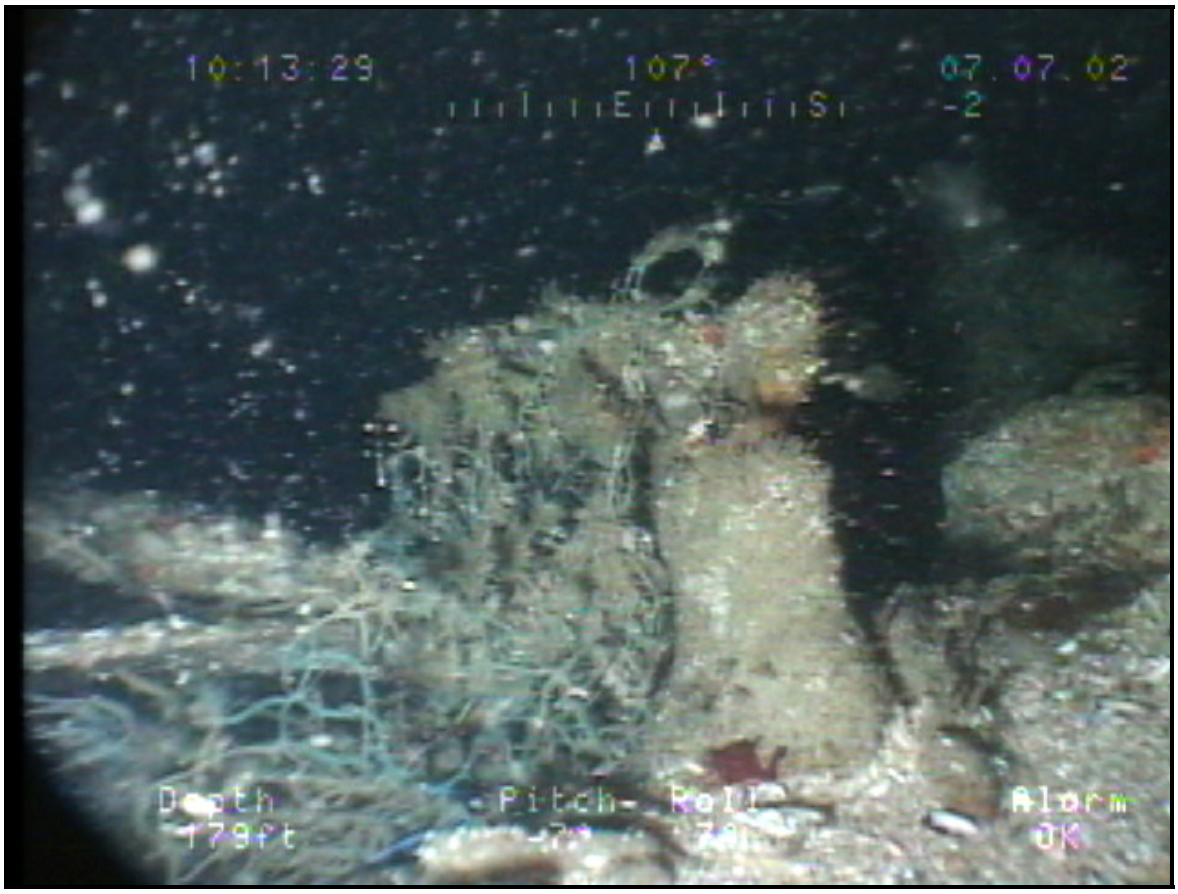

Figure 45. Fishing nets fouled on machinery on the CSS *Alabama*.

Figure 46. ALS-300 Fill pipe, deck flange and cap.

Artifact ALS-300 is a fill pipe, deck plate and cap from the deck of the CSS *Alabama*. Although it is impossible to determine its exact location on deck, the design suggests that the fitting was installed to facilitate filling a fresh water tank located in the hull. The design remains common today, and modern deck fittings have identical holes in

the lid for a spanner. The multi-component artifact is made up of five different pieces. The lid is screwed into the deck plate and the deck plate is screwed onto a short pipe nipple. The pipe nipple is connected to a broken section of pipe by a compression collar. All of the components appear to be fashioned from brass. More detailed information will be available after cleaning.

Artifact Dimensions:

Length (max):	11.8 inches	29.9 cm
Diameter of deck flange:	7.3 inches	18.5 cm
Diameter of cap:	4.6 inches	11.6 cm
Diameter of collar:	3.8 inches	9.7 cm

Figure 47. ALS 301 Lead sheathing for port light aperture.

Artifact ALS-301 is the lead sheathing for one of the conical port light apertures cut through the CSS *Alabama*'s hull. The sheathing prevented water from entering the hull between the planking and ceiling and provided a more finished appearance. The brass frame and glass lens fitted inside the smaller outboard end of the sheathing is missing, and the outboard end of the artifact is heavily damaged.

Artifact Dimensions:

Length (max):	21.6 inches	55.0 cm
Diameter of inboard end:	15.6 inches	39.5 cm
Diameter of outboard end:	10.6 inches	2.7 cm

Figure 48. ALS-303 Fastener with rove.

Artifact ALS-303 is a copper fastener. One end of the fastener has been peened over a rove and the opposite end has a round head. The overall length is 18.1 inches suggesting that it was used to fasten the upper hull structure. The CSS *Alabama*'s contract called for 3/4-inch copper bolts to fasten much of the hull.

Artifact Dimensions:

Length (max):	18.1 inches	46.0 cm
Diameter of the pin:	0.9 inches	2.4 cm
Diameter of the head:	1.5 inches	3.8 cm
Diameter of the rove:	1.6 inches	4.2 cm

Figure 49. ALS-302 Bronze sleeve.

Artifact ALS-302 is a bronze sleeve. The flared end of the sleeve appears to have been a bearing surface. The configuration suggests that it could have been used as a bearing for a gun carriage truck.

Artifact Dimensions:

Length (max):	5.1 inches	12.9 cm
Diameter (max):	5.2 inches	13.3 cm
Diameter (min):	4.1 inches	10.5 cm
Thickness of walls:	0.2 inches	0.4 cm
Flange width:	0.8 inches	2.0 cm
Inside diameter:	3.9 inches	9.9 cm

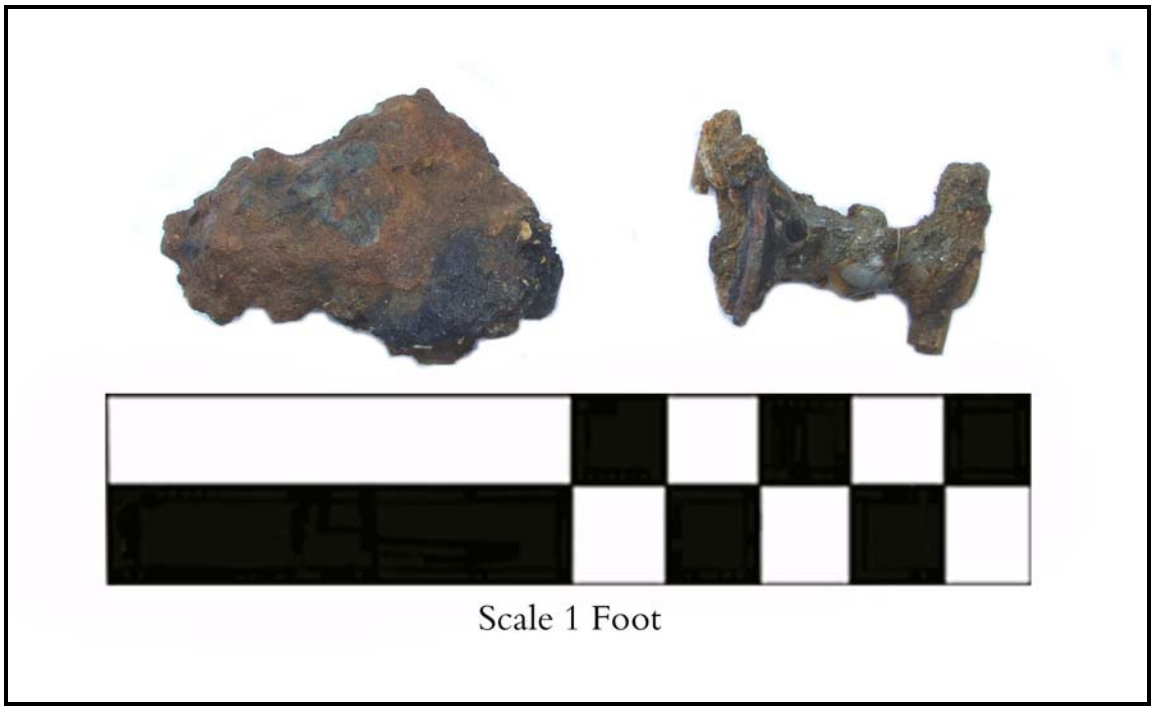

Figure 50. ALS-304 Brass handle.

Artifact ALS-304 appears to be a small brass valve handle or knob and an associated concretion. Cleaning will be necessary before identification is possible. However, it appears that the object is a 2.6- inch long handle attached to a shaft by a screw. The shaft appears to be fitted through a small escutcheon and is attached to a round plate with opposing lugs for locking. More detailed information will be available after cleaning.

Artifact Dimensions:

Length max:	3.3 inches	8.5 cm
Plate diameter:	3.0 inches	7.6 cm
Handle length:	2.6 inches	6.6 cm

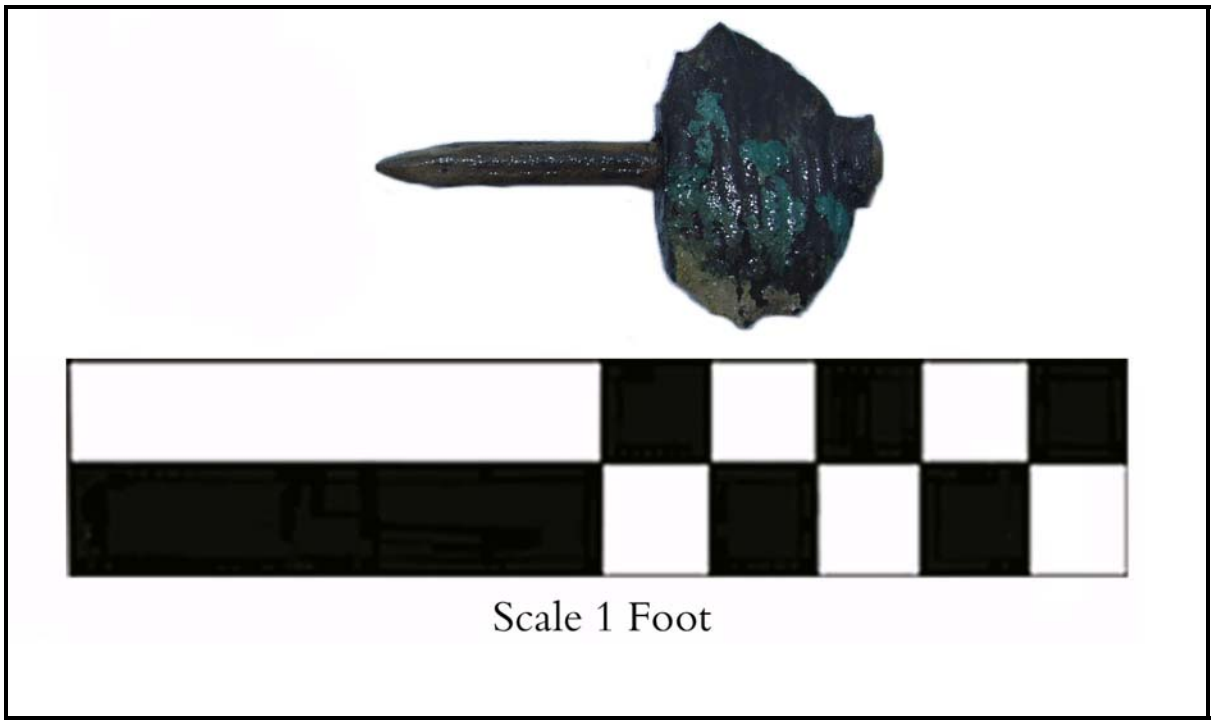

Figure 51. ALS-305 Spike in wood fragment.

Artifact ALS-305 is a spike in a fragment of wood. The spike is fashioned from machine-forged iron. The length suggests that it might have been used to fasten the deck. The wood appears to be teak or mahogany. More detailed information will be available after cleaning.

Artifact Dimensions:

Wood diameter (max):	3.8 inches	9.7 cm
Wood thickness:	2.8 inches	7.2 cm
Spike length (max):	5.8 inches	14.7 cm
Spike diameter:	0.7 inches	1.9 cm

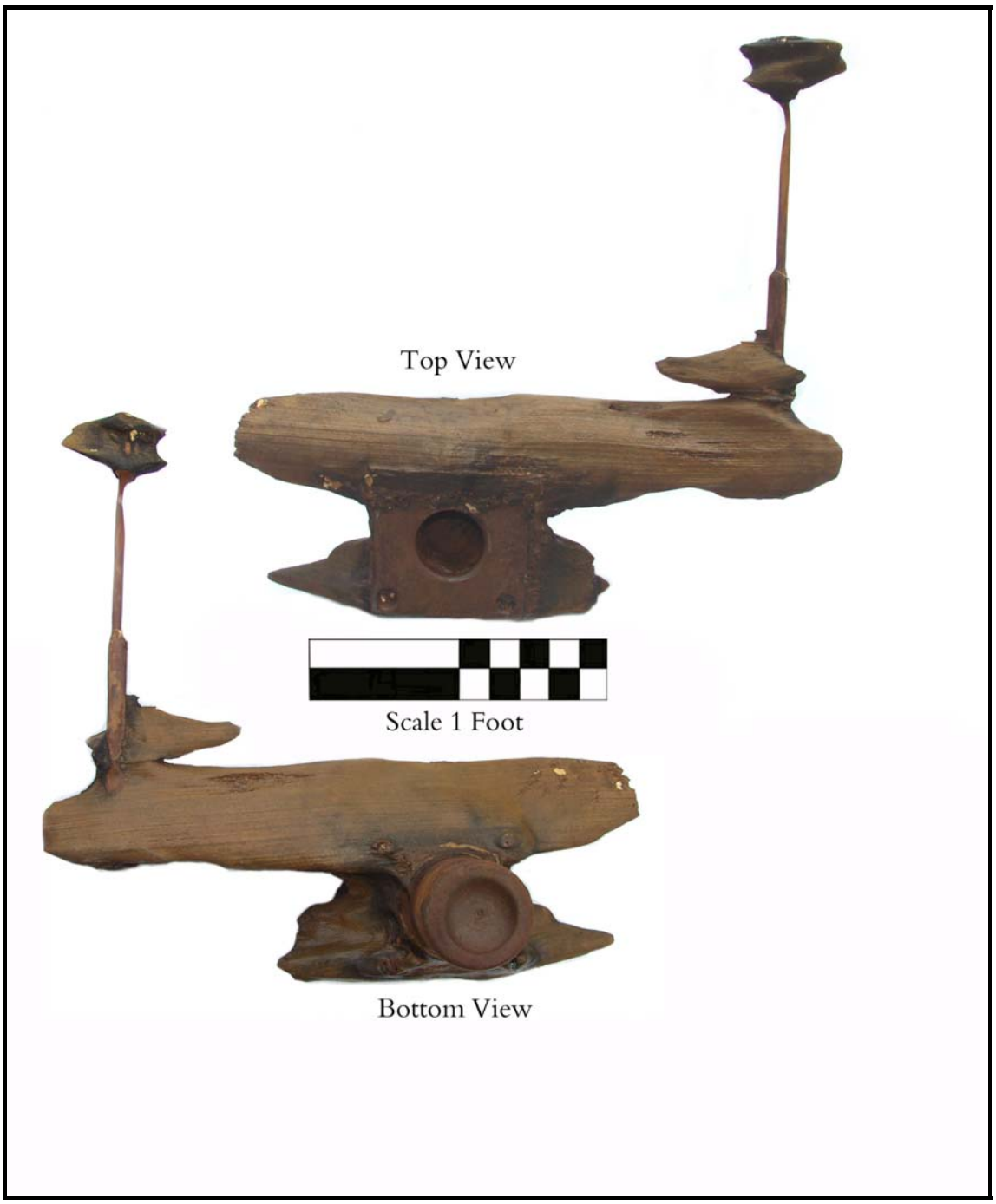

Figure 52. ALS-306 Wood Fragment with copper fastener and pivot socket.

Artifact ALS-306 is composed of fragments of deck planks, a fastener and a gun carriage pivot fitting with fasteners. The fragments of deck plank appear to be teak. The fastener is copper and was driven horizontally through the deck planks. Four copper fasteners secure the gun carriage pivot pin socket to the deck beams. The top

of the pin socket is 6.6 inches square and the length is 9.2 inches. The interior diameter varies from 2.9 inches at the top to 2.7 inches at the bottom. The inside the pin socket is fitted with a collar 5.9 inches below the surface. Recesses in the collar appear to have been designed to accommodate lugs on the pin used to lock it in place. The base of the socket is recessed and has a small hole to drain water. More detailed information will be available after cleaning.

Artifact Dimensions:

Fastener length:	20.2 inches	51.3 cm
Fastener diameter:	0.9 inches	2.2 cm
Pivot fitting length:	9.2 inches	23.3 cm
Deck plate length:	6.6 inches	16.7 cm
Deck plate width:	6.6 inches	16.7 cm
Pivot socket diameter (top):	2.9 inches	7.5 cm
Pivot socket depth (top):	8.2 inches	8.2 inches
Pivot fitting outside diameter (bottom):	4.1 inches	10.4 cm
Pivot fitting interior diameter (bottom):	2.7 inches	6.8 cm

Figure 53. ALS-307 Bell.

ALS-307 is the CSS *Alabama*'s bell. The CSS *Alabama*'s bell appears to be cast in bronze. The mounting lug on top of the head is broken off and remains attached to the mounting bracket (ALS-308). The head of the bell is virtually flat with one reinforce inside the shoulder. Below the shoulder the bell walls flare slightly to the waist approximately half the distance to the lip. Below that point the flare is more exaggerated. Three reinforces decorate the bell immediately above the sound bow and the lip has a flat facet on the exterior. The clapper is missing.

Artifact Dimensions:

Height:	9.75 inches	24.9 cm
Diameter at lip:	13.3 inches	33.7 cm
Diameter top:	6.75 inches	33.7 cm

Figure 54. ALS308 Bell Bracket.

Artifact ALS-308 includes the bracket, mounting screws and remains of the bell flange. The base of the bracket is "T" shaped and vertically concave to fit the foremast of the CSS *Alabama*. Three pan-head lag bolts were employed to attach the bracket to the mast. The bracket arm is contoured, and the end is decorated with a concentric design centered on the hole for attaching the bell. A stud holds the broken bell head lug and two cap nuts secure the stud. All of the components appear to be bronze. More detailed information will be available after cleaning.

Artifact Dimensions:

Height of mounting plate:	10.8 inches	27.5 cm
Width of mounting plate top:	6.4 inches	16.4 cm
Width of mounting plate bottom:	3.125 inches	8.1 cm
Thickness:	.5 inch	1.25 cm
Length of arm:	10.25 inches	26.1 cm
Arm thickness:	1.5 inches	3.81 cm
Arm thickness at Bell mount:	2.5 inches	6.3 cm
Length of lag bolts:	5.0 inch	12.7 cm

Figure 55. ALS-309 Knighthead.

Artifact ALS-309 is a knighthead. The brass cap and remaining wood are 49 inches in length. The dimensions of the wood are 11.6 inches in width and 6.1 inches in thickness. However, the base of the brass cap measures 12.5 inches by 6.5 inches and suggests the original dimensions. The brass cap measures 6.8 inches in height and the top of each head measures 4.5 by 6.2 inches. One of the heads has a 1.8-inch long .7-inch diameter bolt extending from the center. Near the broken end of the beam, a brass three-sheave fairing 9.5 inches high and 8.1 inches wide remains attached. The remains of three wood sheaves are on their axle bolt. The sides of the knighthead were protected by angle brass drilled and countersunk for mounting screws. Two .7-inch diameter brass pins in the side of the knighthead possibly provide an indication of the location of the pin rail. A second brass fairing was mounted on the side of the knighthead opposite the three-sheave fairing. That fairing measured 6.1 inches in length 3.0 inches in width and was attached by four screws. More detailed information will be available after cleaning.

Artifact Dimensions:

Overall length:	49.0 inches	124.6 cm
Timber width:	11.6 inches	29.6 cm
Timber thickness:	6.1 inches	15.6 cm
Triple sheave fairing height:	9.5 inches	24.2 cm
Triple sheave fairing width:	8.1 inches	20.5 cm
Single sheave fairing length:	6.1 inches	15.6 cm
Single sheave fairing width:	3.0 inches	7.6 cm
Brass cap width:	12.5 inches	31.7 cm
Brass cap thickness:	6.8 inches	17.2 cm

Figure 56. ALS-310 Cast Iron Riding Bitt.

Artifact ALS-310 is a cast iron riding bitt. Because of the size and difficulty handling this artifact no measurements were available at the time of report preparation. The base of the bitt is rectangular with rounded corners. A section in the center of the base is recessed approximately .1 inch and two holes for mounting bolts are located near each corner. With the exception of the center area adjacent to the bottom of the bitt cylinder, the base has a lip approximately .1 inch in height. The base is approximately .4 inches thick with rounded sides. The bitt cylinder is approximately 1.8 feet in exterior diameter and 2.5 feet in height. The interior is approximately 1.2 feet in diameter and that opening extends through the base. The forward side of the bitt cylinder was cast with a hollow protrusion approximately .8 feet in height that extends almost to the forward end of the base. The aft side of the bitt cylinder was cast with a second protrusion resembling one end of a cleat. More detailed information will be available after cleaning.

Artifact Dimensions: Unavailable at time of report preparation.

Figure 57. ALS-311 Port Light.

Artifact ALS-311 is a port light. Port lights were used to direct light into the lower deck of the ship and to serve as view ports for crewmembers. The glass lens is set in a tapered brass rim. The brass rim has recessed rings at either end. The lead sleeve is formed around the brass rim. The long tapered sleeve served as a through-hull fitting. Remains of both interior and exterior flanges are apparent and would have been secured with tacks. A soldered seam extends down the lead fairing. Additional similar port lights were also recovered during previous campaigns. More detailed information will be available after cleaning.

Artifact Dimensions:

Maximum diameter:	11.8 inches	30.0 cm
Minimum diameter:	6.5 inches	16.5 cm
Length:	23 inches	58.5 cm

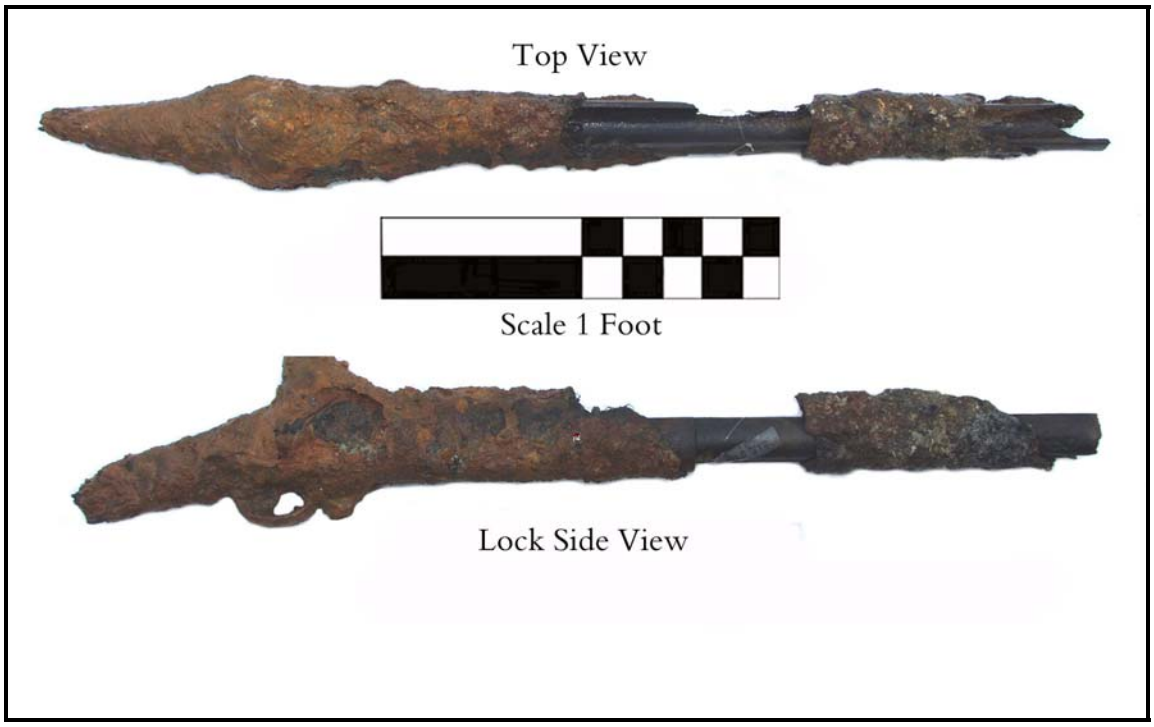

Figure 58. ALS-312 Rifle fragment.

Artifact ALS-312 is a fragment of a rifled musket. The stock behind the handgrip and trigger housing is missing, and the fore stock and barrel were broken off during recovery. The configuration of the lock, hammer and trigger guard indicate that the weapon is an Enfield Pattern 1853. Measurements and more detailed information will be available after cleaning.

Artifact Dimensions:

Length:	31.0 inches	78.5 cm
Barrel outside diameter:	1.2 inches	3.0 cm
Height at hammer:	5.6 inches	14.2 cm

Figure 59. ALS-313 Shoe or Boot Fragment.

Artifact ALS-313 is the remaining fragment of a leather shoe or boot. The sole appears to be intact, but only a portion of the heel and upper survives. More detailed information will be available after cleaning.

Artifact Dimensions:

Sole length:	9.2 inches	23.3 cm
Sole width (max):	3.0 inches	7.5 cm
Heel width:	2.7 inches	6.8 cm
Heel length:	2.3.inches	5.9 cm

Figure 60. ALS-314 Rifle Stock Fragment.

Artifact ALS-314 is a fragment of the stock of a musket. The shape of the stock and the design of the butt plate recess suggest that the weapon was an Enfield Pattern 1853 rifled musket. The butt plate, probably brass, was apparently lost during recovery. More detailed information will be available after cleaning.

Artifact Dimensions:

Length:	14.2 inches	36.0 cm
Butt Height:	4.5 inches	11.5 cm
Grip Height:	2.3 inches	5.8 cm

Figure 61. ALS-315 Deck Plate.

Artifact ALS-315 is a brass deck plate. The rim is drilled for eight mounting screws/bolts and the interior is threaded for the cover. The cover is threaded to mate with the rim and recessed to accommodate a flush handle. More detailed information will be available after cleaning.

Artifact Dimensions:

Diameter:	13.1 inches	33.4 cm
Cover diameter:	10.1 inches	25.8 cm
Handle depression diameter:	5.0 inches	12.6 cm
Handle width:	0.9 inches	2.3 cm
Outer rim width:	1.6 inches	4.1 cm

Figure 62. ALS-316 Gun Truck Block.

Artifact ALS-316 is a gun truck tackle block. It is likely that the block was used to move and secure one of *Alabama's* large pivot guns. One such block is visible in the photo of Raphael Semmes leaning against the aft pivot gun **(Figure 9)**. This particular single-sheave block was hooked to a large eye bolt in the deck. This was coupled with a double-sheave block hooked to the cannon truck to provide mechanical advantage to pivot the cannon. One of the upper double-sheave blocks was recovered from the site in 1991 and a single-sheave block was recovered in 2000.

The block is made entirely of brass and both the hook and eye are designed to swivel.

Artifact Dimensions:

Overall length:	17.0 inches	43.2 cm
Width (max):	5.7 inches	14.6 cm
Hook span:	5.4 inches	13.6 cm
Hook diameter (mid curve):	1.6 inches	4.0 cm
Sheave axle length:	3.3 inches	8.4 cm
Sheave width:	1.3 inches	3.3 cm
Sheave diameter:	4.2 inches	10.8 cm

Figure 63. ALS-317 Copper Fastener.

Artifact ALS-317 is a copper fastener. One end of the fastener has been peened over a rove and the opposite end has a round head. The overall length is 12.1 inches suggesting that it was used in fastening the upper hull structure above the weather deck. The CSS *Alabama*'s contract called for 3/4-inch copper bolts to fasten much of the hull.

Artifact Dimensions:

Length:	12.2 inches	31.0 cm
Shaft Diameter:	0.8 inches	2.0 cm
Head Diameter:	1.4 inches	3.5 cm
Rove Diameter:	1.3 inches	3.3 cm

Figure 64. ALS-318 Ironstone Plate.

Artifact ALS-318 is a white ironstone plate. The undecorated style does not match any of the other styles recovered from the CSS *Alabama*. The "Davenport" maker's mark on the bottom confirms its manufacturer. The anchor suggests one of Davenport's marine wares. It is possible that the plate was the personal property of one of the *Alabama*'s officers, or was taken from a prize vessel by a crewmember.

Artifact Dimensions:

Diameter:	7.8 inches	19.7 cm
Height:	0.8 inches	2.0 cm

9. Results of the 2002 Investigation

The 2002 investigation of the CSS *Alabama* shed some new light on the wreck and reconfirmed the complex nature of conducting research at the site. Accomplishing the objectives of the diving phase of on-site operations proved to be impossible due almost entirely to equipment problems. However, in spite of those difficulties some additional information about the wreck was generated and a limited number of artifacts were recovered. Equipment problems and environmental conditions also plagued the ROV operations. While the video and photographic data collected by the ROV contributes little to the production of a scaled geo-referenced mosaic of the wreck site, those data can be used to produce a more comprehensive plan of the site.

9.1 Dive Operations

The means of excavation at the CSS *Alabama* wreck site remains an unresolved problem. In 2001, a 100-psi, 100 cfm compressor was carried on board the American research vessel *Enrica*. The low-pressure gas-powered compressor provided sufficient volume to adequately power a 4-inch airlift at the *Alabama*'s depth. However, the compressor took up almost all of the available deck space and gasoline for the engine was determined to be a potential hazard at sea. Immediately prior to shipping the *Enrica* to France to support the 2002 investigation, a hydraulic system was fitted to the vessel's diesel engine. The pump attached to the diesel powered a hydraulic motor adapted to the compressor. That system was designed to provide additional room in an already overcrowded dive support platform and increase safety by eliminating the compressor's gas engine. Unfortunately, there was no time to test the system and it proved to be entirely ineffective. The lack of a source to power the airlifts eliminated any possibility of conducting any of the research or large artifact recovery associated with excavation.

While proposed test excavations and large artifact recovery in the bow and stern had to be abandoned due to compressor problems, time on site permitted some useful observations. A close inspection of the lifting frame and screw propeller confirmed that the upper sections of the frame can be removed and the lifting yoke employed to recover the propeller (Figure 65). Although the upper sections of the lifting frame are almost 30 degrees out of vertical, the propeller is now in an upright position. As the propeller was designed to be lifted out of the water in a vertical position, the shaft key is aligned to permit it to be lifted out of the wreck without damaging the shaft or lower frame.

Figure 65. Forward base of the lifting frame and propeller hub.

An examination of the lower hull forward of the lifting frame confirmed that the level of sediment within the hull structure is approximately 2.5 feet above the tunnel for the propeller shaft. That indicates that almost 12 feet of the ship's hull lie beneath the sediment in the stern. Amidships around the boilers almost twelve feet of the hull survive on the starboard side while only four feet of the port side survives. Forward, there appears to be at least eight feet of hull remains beneath the bottom surface.

French volunteers were able to identify and recover a variety of artifacts exposed on the bottom surface. With the exception of an ironstone plate and a shoe or boot, the majority of that material was associated with the vessel structure. Most consisted of fittings and fasteners. The position of each artifact was established by triangulating measurements from several previously documented and permanent elements of the *Alabama*'s structural remains. Underwater video was used to document each artifact prior to recovery.

In the bow, French Navy divers used makeshift airlifts and a diver propulsion vehicle to remove sediment from around the base of the galley stove. While equipment limited excavation, one side of the base of the stove was exposed. That

confirmed that the stove was still attached to a section of collapsed deck. In the process of clearing sediment from the base of the stove, divers identified the CSS *Alabama*'s bell and the bracket that attached it to the foremast. The bell and bracket were recovered along with several parts of Enfield rifled muskets and one of the large cast iron riding bitts that lay adjacent to the port side of the galley stove.

9.2 ROV Operations

The most important objective of the 2002 CSS *Alabama* investigation was documentation of the wreck site. While ROV operations were also constrained by a variety of equipment and environmental complications, more than two thousand images and seven hours of videotape were recorded. Those images document many of the significant features of the wreck. Once cataloged, they will be used to generate a more detailed plan of the wreck site and a perspective image of the exposed remains. While not the scaled mosaic that was the planned objective, both an enhanced site plan and perspective image will contribute to research at the site.

The ROV operations also helped to identify artifacts exposed on the bottom surface. Material such as ceramics, glass and glassware, fasteners, fittings, small arms, gun tackle, shot and shells and personal effects could be recovered illegally with little effort. The ROV images provide documentation of the nature and extent of that material.

10. Conclusions

Although the 2002 investigation of the CSS *Alabama* produced limited results, a number of important conclusions can be drawn from the exercise. Clearly the most important conclusions are associated with the last minute dynamics of the project. As funding was not released by DOD Legacy Resource Management Program in time to obtain and test equipment, the objectives of both the diving and the ROV phases of the research were compromised. Without adequate equipment and time for testing, excavation proved impossible. Without an operational underwater positioning system and camera, lens and lighting for the ROV, any possibility to collect photographic data to construct a scaled mosaic was lost before the mission began.

In retrospect, the 2002 CSS *Alabama* Project should have been postponed until all of these problems had been resolved. Any consideration of returning to the CSS *Alabama* for serious research should be predicated on sufficient funds and time for adequate planning, training and equipment testing. Otherwise it is difficult to justify any on-site activities that go beyond the scope of a reconnaissance and "at

risk" artifact recovery. In the event that funding is available for additional research at the site, priorities should be established and plans formulated on the basis of what is realistic with available resources.

11. Recommendations

Recommendations for additional research at the CSS *Alabama* Site remain much as they were prior to the 2002 investigation of the wreck. From a strictly historical and archaeological perspective priorities should include:

1. Mosaic and Mapping of the Wreck Site
2. Continued Test Excavation
3. Limited Systematic Artifact Recovery

Plans for the conduct of any of those research activities should include identifying, testing and training with the equipment necessary to accomplish those objectives.

11.1 Mosaic and Modeling of the Wreck Site

Development of an accurate mosaic-based plan of the CSS *Alabama* remains as the most important priority for continued on-site research. Based on the 2002 experience, it is apparent that an ROV must be sufficiently powerful to maintain station and be equipped with a functional positioning system, the right combination of digital underwater television and still cameras and a powerful lighting system.

In the event that additional ROV operations are planned the proposed system should be tested to demonstrate:

1. Launch and recovery capability in 3 to 5-foot seas.
2. A functional geo-referenced on-site acoustic positioning system.
3. Moored or dynamically positioned surface support vessel.
4. ROV tracking system onboard surface support vessel.
5. Digital camera and corrected lens capacity to operate at 6 and 12 feet above the bottom surface.
6. Lighting adequate to document the wreck site from 6 and 12 feet above the bottom surface.
7. Rapid digital camera recovery and real time function.

Unless those criteria can be met, it would be worthwhile to consider developing a diver-operated system. The test mosaic constructed from dive-recorded images in

2000 indicates that this could be a viable option (Figure 2). However, the time and resources must be available for developing and testing a diver-operated system.

A third consideration might be the use of an autonomous underwater vehicle (AUV). Those vehicles are currently available. In addition, they are capable of carrying a variety of remote sensing and video or photographic equipment. Prior to any decision about the conduct of additional documentation, the use of an AUV should be seriously considered.

Regardless of the means of developing a mosaic of the wreck site, additional mapping of the exposed structure should be a priority for work on the wreck. Diver operated short baseline systems are available that would permit the major features of the site to be efficiently and accurately mapped. That would significantly enhance the accuracy of the site plan (Figure 8) and provide three-dimensional control for mosaic development.

11.2 Test Excavation

To date, test excavation within the surviving hull structure has been limited. Development of an effective means of sediment removal, in 2001, permitted test excavation to reach levels within the CSS *Alabama*'s surviving structure that have remained undisturbed since sediment filled the hull. That preliminary testing confirmed that the interior of the *Alabama*'s hull contains an undisturbed and highly valuable archaeological record. Cultural material recovered from the 2001 test excavation confirmed that artifacts and structural remains within the hull are extremely well-preserved.

Efforts to continue that excavation in 2002 were entirely frustrated by a redesigned, but untested airlift system. To excavate effectively, a larger surface support vessel will be necessary. In addition, a higher capacity compressor will be required. Without the resources to ensure that level of support, additional attempts to excavate should be abandoned.

In the event that continued excavation is a priority, additional archaeological personnel will be required. All excavation within the undisturbed archaeological context must be carried out employing a methodology designed to recover not only surviving cultural material, but also the irreplaceable archaeological record associated with it. Continued test excavation can only be recommended, if both an experienced team and an acceptable methodology can be employed.

Personnel must be composed of archaeologists and archaeologically trained divers. One or more archaeologists must accompany and direct each team. Based on

previous experience, at least three teams will be necessary to operate throughout the tidal window. Each team should be composed of at least three, and ideally four members. Within a two-meter-square investigation area, an archaeologist and an assistant could excavate, a second archaeologist could map exposed material and structural remains and the fourth member would video and photograph the work and document the excavation.

A team of sufficient size to support continuous investigation through the tidal window would require 12 diving personnel, a vessel captain, an equipment operator and a diving safety officer. Divers should be equipped with communication equipment to facilitate team and team-to-surface coordination of research activity. While the 29-foot vessel *Enrica* worked effectively during the 2001 investigation, the 2002 investigation made it apparent that there would not be sufficient space on board to support extra personnel and equipment to conduct a better-supported investigation. For the level of on-site activity to be increased, additional experienced archaeological personnel must be recruited and a larger American flag vessel must be employed for surface support. The size of that vessel must be balanced between what is necessary to carry the required personnel and equipment and what can effectively be anchored at the site. An ideal compromise appears to be a vessel between 35 feet to 38 feet.

If sufficient resources are available for extended excavations, the focus of that activity should continue to be testing in the stern, excavation at the base of the lifting screw and to conduct a test in the crew's quarters forward. Continued excavation at the test site in the stern should be designed to reach the bilge ceiling and expose both elements of the ship's structure preserved below the bottom surface and material within the hull. A second objective would be to test the forward area of the ship where the crew would have stowed their personal effects. Testing forward would generate data concerning both the condition of the wreck forward and the nature and scope of the archaeological record associated with the crew.

11.3 Artifact Recovery

The recovery of artifacts from the CSS *Alabama* should not be a priority for additional research, unless the artifacts either contribute to a more detailed understanding of the vessel and life aboard the ship, or they are considered to be at risk because of their exposed position on the seabed. Artifacts generated by additional excavation or specifically identified for recovery because their study and analysis potential contribute to the body of historical or archaeological information associated with the CSS *Alabama*.

If the recovery of specific artifacts associated with the ship is determined to be a priority for future research, consideration should be given to several items that have been previously identified. Those artifacts include the aft pivot gun, the aft Downton pump and the galley stove. Recovery of the aft pivot gun would mean that an example of each type of ordnance carried by the CSS *Alabama* would be available to support a study of the ship's battery. It would also mean that one of each type of weapon in the battery was available for display and interpretation of the ship. Recovery of the aft Downton pump would ensure the preservation of one of the two manual fire and bilge pumps that were aboard the ship. While preservation would be complex because of the multi-metal construction of the pump, the exercise would provide insight into the problems associated with conservation of the ship's steam machinery. Like the guns of the ship's battery, the pump would also make an interesting exhibit, because it was fabricated from a very unique design. Finally, recovery of the galley stove could provide insight into the nature and preparation of meals aboard the Confederate commerce raider. The galley stove would also provide an immediately recognizable artifact for display and interpretation.

Recovery of "at risk" artifacts exposed on the seabed should always be a priority for additional on-site research. Each investigation of the wreck site reveals additional material that has been exposed by changes in the sediments covering the remains of the *Alabama*'s hull. Although exposure does not necessarily threaten artifacts on the bottom surface, it does make them immediately accessible to divers that visit the site without permission from the United States or France. Although provenience might be difficult to establish, recovery of exposed artifacts can make a contribution to illustrations of life aboard the ship. As has been the case in the past, all recovered material must be photographed *in situ* and the position recorded using traditional triangulation or an acoustic positioning system.

11. 4 Diving, Training and Equipment Testing

The use of an American flag vessel has permitted American divers to operate on site using American dive protocols. That has facilitated integrating new personnel into the archaeological team and permitted operational plans to include the use of mixed gases. However, work at the CSS *Alabama* is still carried out using traditional SCUBA equipment and compressed air. Much more sophisticated diving systems are available. Those include mixed-gas systems that can greatly extend bottom time and increase the safety and productivity of operations at depths below the practical limits of scuba.

The procurement and testing of mixed-gas diving equipment for the 2002 CSS *Alabama* project was a problem. Because funding was not available until April 2002,

the necessary mixed gas and equipment could not be ordered and shipped for timely delivery. Almost all equipment that was obtained at the last minute arrived too late for anything, but superficial testing. The dive support vessel and project equipment was shipped to France in May in order to be available for on-site operations in June. That precluded both testing and basic familiarization. Many problems that could have been identified and resolved before initiation of fieldwork became serious issues during the campaign.

As rudimentary as the concept of testing of, and training on, equipment in field research, every effort must be made to ensure that untested diving equipment does not remain a problem in the future. Because much of the equipment is associated with life support, it is also essential that the project staff be provided time to train before beginning field operations. As has been the case in every previous year, testing and training must be a critical consideration in planning and conducting additional operations.

Previous investigation confirms that the wreck of the CSS *Alabama* contains a rich and varied archaeological record. That record preserves irreplaceable and highly specific insight into life aboard the most successful Confederate commerce raider. It also preserves more generalized insight into the South's most effective means of making the war felt in the United States. Although the wreck site lies in a very dynamic environment, that important historical and archaeological record can be recovered. Continued investigation of the CSS *Alabama* requires careful planning, and support necessary to conduct a safe and successful investigation of the wreck.

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Appendix A: 1995 Agreement between France and the United States

AGREEMENT

This agreement is made by and between the United States Navy, represented by the Naval Historical Center, hereinafter referred to as the "Navy", acting for the Government of the United States of America, owner of the *ALABAMA* wreck and its associated artifacts,

on the one hand,

and the Association CSS Alabama, a non-profit private-law association registered under the French Law of 1901, hereinafter referred to as the "Association",

on the other hand,

and hereinafter together referred to as the "Parties" to this agreement.

Whereas the Government of the United States of America, as the successor State to the former Confederate States of America, is the owner of the wreck of the CSS *ALABAMA,* a Confederate warship sunk by the USS *KE,4RSARGE* in battle off Cherbourg, France, on 19 June 1864, including its contents, apparel and equipment; and

Whereas this ownership was recognized by the government of the Republic of France in the Verbal Note N° 2826 addressed to the Ambassador of the United States in France by the Ministry of Foreign Affairs, dated 18 October 1991; and

Whereas the Agreement signed by the United States of America and the Republic of France in Paris on 3 October 1989, a copy of which is attached as Exhibit A, hereinafter referred to as the " 1989 Agreement", recognizes mutual national interests in this important heritage resource, ,and provides for the establishment of a Joint French-American Scientific Committee, hereinafter referred to as the "Committee", to make recommendations to the respective governments on the protection, the conditions of exploration and the scientific study of this wreck site in the historic and cultural interests of both nations; and

Whereas the above-mentioned 1989 Agreement recognizes that the wreck of the CSS *ALABAMA* resides within the territorial waters of the Republic of France and is therefore subject to French law, including regulations for the protection of historic shipwrecks and archaeological sites under laws administered by the French Ministry of Culture; and

Whereas a shipwreck was located by the French Navy's mine hunter CIRCE on 30 October 1984 and its identity later confirmed as that of CSS *ALABAMA* by Captain Max Guerout, French Navy; and

Whereas in 1988 the Association was founded as a non-profit organization and registered under the Law of 1901 for the purpose of conducting the scientific exploration and study of the CSS *ALABAMA* and its wreck site, in accordance with the laws of France governing underwater archaeology, and from 1988 to the present, has successfully financed, exclusively from French sources, and conducted seven annual investigations of the wreck and its immediate surroundings for the purpose of evaluating the archaeological potential of the site and undertaking excavation, thereby demonstrating its ability to carry out professional archaeological research on this difficult site; and

Whereas, as required by French law (Chapter IV of the Decree of 26 December 1961 and Article 9 of the Law 89-874 of 1 December 1989), the Association wishes to establish with the owner, represented by the U. S. Navy, an agreement on mutually acceptable operating principles by which the investigation of the wreck site can be continued and the development of its public and private funding pursued in the United States as well as in France and elsewhere; and

Whereas it is to the advantage of both the Association and the Navy to enter into an agreement recognizing their mutual interests in the wreck site, establishing an operating agreement by which the rights and responsibilities of the Navy and of the Association are recognized, and recognizing as well the particular rights afforded to the Association's principal archaeologist; and

Whereas the Association recognizes its responsibility for its own work and actions performed on the *ALABAMA* wreck by persons intervening on the site on its behalf, and for objects removed from the site while in its

custody, during field conservation treatment (Phases I and II of the conservation process; see Exhibit B) and until they have been transferred either to the owner or to the conservation laboratory designated by the owner. It may also help finance the cost of Phases III and IV of the conservation treatment performed in French laboratories when possible; and

Whereas the owner has recognized his responsibility for financing, to the extent that the necessary funds are available for this purpose, Phases III and IV of the conservation treatment of *ALABAMA* artifacts (see Exhibit B), in particular, but not exclusively, all such treatment performed in laboratories in the United States; and

Whereas the Navy, in addition to assuming its own administrative costs on behalf of the owner and the costs of conservation as indicated above, as well as ensuring the curation and security of the artifacts beginning with their transfer to the United States, may also agree to fund a share of the costs of the archaeological project, and may contribute cash, in-kind services, or provide other resources agreed upon by the Parties, to the extent those resources are available; and

Whereas, under French law and regulations, the Association as operator must present to the Ministry of Culture its financial plan for the operations for which it requests an official permit, and assumes thereby the responsibility for seeking the funds necessary to carry out the proposed archaeological operations in accordance with requirements pertaining to the excavation and conservation of retrieved objects;

Now, therefore, the two Parties do mutually agree, as follows:

1 . The study, management and protection of the CSS *ALABAMA* site is guided by the principle that the shipwreck is an important and unique part of both American and French naval history, of great mutual and international interest. Its exploration and study require the advice of the Committee. Considered to be a fragile, non-renewable heritage resource, the wreck is to continue to be studied in a manner consistent with its protection, insofar as its physical environment allows, for the present and for the future.

2. The government of the United States of America as owner of the wreck and the associated artifacts of the *CSS ALABAMA,* represented by the Navy, accredits the Association as operator of the *ALABAMA* archaeological project and recognizes its responsibility for the scientific study, research and management of this project, subject to official permits issued by the Ministry of Culture of France and to the Association's conformance with the terms of this agreement. In that capacity, the Association and its principal investigator are responsible for defining short and long term research goals and for incorporating them into a research "design" for their investigation of the wreck. This research plan shall be addressed to the Committee for review and for recommendations to the Minister of Culture, the cognizant French authority. A copy shall be sent to the representative of the owner unless he is also a member of the Committee.

3. a) The Association, as the authorized operator, assumes the responsibility for its actions on, to, and from the CSS *ALABAMA* wreck site defined to be the remains of the ship and its associated artifacts, including the consequences of accidents involving personnel intervening on the site on its behalf and under the authority of its principal investigator. For each campaign on the site, the Association shall subscribe, as in the past, an insurance policy covering civil responsibility claims resulting from actions of its personnel or of persons acting on its behalf and in accordance with instructions issued by its principal investigator. In the foregoing conditions, it hereby agrees not to hold the owner or his representative liable for damages incurred by personnel or equipment.

b) If U. S. Navy equipment and/or personnel are designated to perform a specific service for the Association on the *ALABAMA* site, a particular contract shall be signed specifying the duration of and the conditions attached to the service to be rendered. The Association shall then subscribe a special insurance policy to cover the risks assumed under the terms of that particular contract.

c) When, in accordance with the terms of the 1989 Agreement, United States observers are present on site (on the surface or underwater), the Navy assumes responsibility for their actions to the extent provided by applicable law.

4. The Navy has the responsibility, as representative of the owner, of funding its own administrative costs as well as those of Phases III and IV of the conservation treatment of *ALABAMA* artifacts, to the extent necessary

funds are available for this purpose, and of their curation while in its custody. It may also agree to contribute to the costs of the archaeological exploration itself, as well as to provide services and rights as set forth hereinafter.

5. The Association's prime responsibility is for the archaeological exploration of the site and the recovery of artifacts and material as approved by the Scientific Committee and the owner. It is also responsible for Phases I and II of the conservation process as defined above and consequently for the objects undergoing such treatment while in its custody. It may also attempt to fund or to obtain without cost to the owner Phases III and IV of the required conservation treatment, in particular when performed in French laboratories.

6. At its discretion, the Navy may support the efforts of the Association to investigate CSS *ALABAMA,* offering in-kind services to the extent they may be available and specific rights to the Association and its sponsors. They may include, but are not limited to, cooperative and supporting technical assistance in historical and archaeological research, field and laboratory investigations, diving, recovery, transportation, artifact conservation (cf. Para.4), data analysis, exhibition, publishing, communications. These services and/or rights must be mutually agreed to and desired by the Association and the Navy, except those provided in Paragraph 9 below.

7. Specific rights offered by the owner to the Association's sponsors may include, but are not limited to, short and long term loans of artifacts. In addition to those mentioned in Paragraph 6 above, specific rights offered by the owner to the Association may include, but are not limited to, the use in its own publications, subject to normal scholarly citation, of graphic images (films, photographs and video) and other documentation held in U. S. Navy collections.

. The Association holds all exclusive property rights over its own collection of photographic and other graphic images, including all such items as it may acquire by purchase or by gifts from individuals, groups or companies. Any photographs or other graphic images provided to the Navy shall be marked as "Proprietary data. Publication without the express permission of the Association CSS ALABAMA is prohibited."

9. The Association may decline specific rights offered by the Navy but accepts to fulfill the following requirements considered by the Navy to be necessary to follow onsite investigations and to protect the fundamental rights of the owner over its property:

A. The Association will observe and abide by the terms of the 1989 Agreement, including the possibility offered by Article 7 for both France and the United States to have at least one observer present at excavation operations. The observer(s) may operate either on the surface or underwater; in the latter case, his activities will be entirely separate from those of the Association under the conditions prescribed in 9 B below.

B. The surface observer(s) is free to witness and photograph from the Association's dive boat all objects as they arrive at the surface and are placed on the boat, and may at **will** collect graphic images and other data on the surface. He may also obtain from the Association's principal investigator information concerning past and present operations, including site conditions as they change, to be used solely for reporting to the representative (s) of the owner and to his own employer agency.

The underwater observer(s) may also dive on the wreck site and is free to witness and photograph during such dives, subject to the approval of the director of the archaeological project. Such approval shall normally be given, subject to prior notification by the owner (see paragraph 9 C) and to possible restrictions imposed by weather conditions, safety hazards or regulations, or due to the daily diving and work schedules that are the sole responsibility of the director of the archaeological project. The observer is responsible for obtaining in advance all authorizations required by the French Ministry of Labor for divers qualified to descend to 60 meters. He is also responsible for providing his own means of access to the site and shall not interfere in any way with the actual work underway on the bottom.

The Association and the observer(s) will provide assistance to each other in case of danger.

The owner and his representative are liable for any damage caused by the observer(s), to the extent provided by applicable law. The Association cannot be held liable for any damage caused by the observer(s).

C. The owner and its representative make the necessary agreements, contracts and arrangements for these and other services.

The owner or its representative shall provide the Association at least thirty days notice in the case of pending observer visits, and sixty days notice before transport or removal of artifacts in the custody of the Association which are not otherwise subject to existing loan agreements.

D. The conservators of either France or the United States that are funded or contracted by either the Association or the Navy to provide services to the *ALABAMA* project shall have the right to independently study, analyze, publish or otherwise disseminate technical information on artifact conservation performed on CSS *ALABAMA* artifacts under their supervision, subject to the terms of their contracts or agreements.

E. As in the past, the Association will continue to provide each French and U. S. representative to the Committee with one copy of its annual field report, including the registry of artifacts recovered, with photographs, sketches and any other pertinent information available. If additional copies are required for official purposes by any one of the representatives, they may be made by him at his expense. Annual field reports provided to the Navy shall include a statement that they contain proprietary information and their release is governed by paragraph 10.A. of this present agreement between the United States Navy and the Association CSS Alabama.

F. At the conclusion of the Association's study of the CSS *ALABAMA* and after publication of the archaeologist's findings, or at such point as the project may be otherwise terminated, the Association will, in accordance with French requirements, deposit its documentation in the Department des Recherché Archdologiques Sous-Marines at Marseille and **will** provide copies to the representative of the owner. The final study provided to the Navy shall include a statement that it contains proprietary information and its release is governed by paragraph 10.A of this present agreement between the United States Navy and the Association CSS Alabama.

10. The Navy hereby recognizes that the intellectual property rights of the Association and its principal archaeologist include the following:

A. The Association and its principal archaeologist have the right of first use and publication of their own findings, including methodology or techniques developed during the investigation, the analysis of the site and its contents, and other conclusions reached under their direction. This right of first use and publication shall not exceed ten years from termination of the last season of excavation. The rights of the Association and its principal investigator recognized in this paragraph shall not interfere with the Navy's ability to respond in general terms, preferably by using the Association's press releases, when these are made available to the Navy, to routine press or other inquiries regarding activities at the site and its agreement with the Association. The Navy shall provide copies of any such responses to the Association. All inquiries from archaeologists, historians or other writers, requiring substantial data or other information from any report of the archaeologist shall be referred to him for his response.

B. The Association owns and determines the use of its collection of photographic images of the wreck site, particularly of all underwater views. It reserves the right to release them to its sponsors, publishers, authors, or the media, to be used for public relations or for other purposes as it sees fit.

C. The Association and its principal archaeologist have the right of first use, study and publication concerning artifacts recovered by the Association from the CSS *ALABAMA* wreck site, as is compatible with the need for stabilization or conservation of recovered materials. This right shall not interfere with or delay publication or dissemination of technical information on artifact conservation by authorized conservators working with *CSS ALABAMA* artifacts in either France or the United States. This right shall not interfere with or delay timely stabilization and conservation of recovered materials, and, unless justified to the satisfaction of the Navy, this right shall not exceed twelve months from the date of recovery. Extensions may be granted for further study upon the documented request of the archaeologist, if without prejudice to the objects retained.

D. The Navy shall now and in the future prominently credit the Association CSS Alabama for funding and accomplishing the recovery of *ALABAMA* artifacts in all displays or publications concerning them, and shall likewise credit Electricitd de France for the conservation treatment of all such objects having been treated in its laboratories. The Association will likewise credit the Maryland Historical Trust for all such objects having been

treated in its laboratories, and the U. S. Navy for the conservation treatment that it finances. It will credit the Naval Historical Center for curation and documentation services provided. Both the Navy and the Association shall further require of all repositories receiving traveling exhibitions of *ALABAMA* objects to observe the same rules.

11. The Navy and the Association recognize that research questions pertaining to archaeological artifacts may arise long after an artifact has been released for transport, conservation or exhibition, or after this agreement has expired. Therefore, both Parties and their designated conservators and curators, shall make reasonable efforts to assist the Association's archaeologist with research inquiries that pertain to *ALABAMA* artifacts under their management. These efforts shall include artifact photography, visual inspection and communication of findings to the archaeologist. In addition, conservators and curators shall provide for access to the artifacts with reasonable advance notice so that the archaeologist may conduct his own research.

12. The Navy and the Association agree to inform each other of all developments, discoveries, changes of policy, or other factors that affect this agreement and the archaeological investigation of the CSS *ALABAMA* wreck site.

13. Unless otherwise agreed by both Parties in writing, each Party shall fund its own expenses for activities conducted pursuant to this agreement. All obligations of the Parties under this agreement are subject to national laws, regulations, and the availability of necessary resources or appropriated funds for such activities.

14. This agreement shall be in effect for five years from the date on which it is signed.

It may be amended by mutual agreement of the two Parties.

If circumstances outside the control of either or both Parties should constitute a case of force majeure, or if other imperative reasons should so require, this agreement may be terminated by either Party upon condition 1) that an opportunity for consultation has been offered to the other Party with a view to avoiding premature rupture, 2) that, in case it is decided to pursue premature termination, due notice be given to the other Party, and 3) that the date of termination not become effective until six months after due notice has been given.

The decision for premature termination shall be communicated to the Committee and to the Ministry of Culture of France by the Party responsible for the decision, or by both Parties if so desired. We the undersigned, having read, understood and accepted the terms of this Agreement, so affix our signatures on duplicate copies, one of which shall be given to each of the signers:

ASSOCIATION CSS **ALABAMA**

Ulane Bonnel

Ulane Bonnel, President
of the Association

Signed in ~~Paris~~ Washington on:

(date) 23 March 1995

UNITED STATES OF AMERICA

William D. Vance

William D. Vance
Captain, U.S. Navy,
Director of Naval History,
acting for the United
States Navy

Signed in Washington on:

(date) 23 March 1995

Attachments:

Exhibit A:	Agreement between the Government of the United States of America and the Government of the Republic of France concerning the Wreck of the CSS ALABAMA, signed in Paris on 3 October 1989
Exhibit B:	Compte rendu de la rdunion du Comit6 scientifique du CSS ALABAMA, 19-22 octobre 1992

EXHIBIT A
Agreement between
the Government of the United States of America and
the Government of the French Republic
concerning the Wreck of the CSS ALABAMA*

The Government of the United States of America and the Government of the French Republic,

Recognizing the historical and archeological importance of the CSS *ALABAMA*, sunk in battle with USS *KEARSARGE* on June 19, 1864, approximately 7 nautical miles off the coast of Cherbourg, France,

Wishing to co-operate to ensure the protection and study of the wreck, situated in French territorial waters,

Have agreed as follows:

Article 1. A Scientific Committee composed of two representatives of each of the two governments and of experts designated by each government is hereby established on a basis of equality.

Article 2. Any measure related to scientific activities or any project concerning the development of the wreck of the CSS *ALABAMA* shall be reviewed by the Scientific Committee, which shall make its decisions by agreement of the representatives of both governments.

Article 3. The provisions adopted by the French Government to establish a zone of protection around the wreck of the CSS *ALABAMA* shall remain in force for the term of this agreement, unless the Parties decide otherwise. The competent French authorities may amend these provisions, as necessary. Neither Party shall take measures adversely affecting the wreck or its associated artifacts without the agreement of the other Party.

If the conservation of the wreck is compromised, the competent French authorities may take, on their own authority or at the request of the United States authorities, the conservation measures necessitated by the situation. In the event such urgent action is taken by the French authorities, they will notify the United States authorities promptly of the full details regarding such action.

Article 4. Proposals adopted by the Scientific Committee will be submitted to the French Minister of Culture, who shall grant the necessary authorizations with due regard for the procedures provided for by French law.

Article 5. The Scientific Committee shall review the execution of the authorized scientific activities and shall follow the corresponding operations as they occur.

Article 6. Each Party will bear the costs of its representatives and its experts.

Article 7. Each Party will be entitled to have at least one observer present at each excavation operation.

Article 8. The Scientific Committee shall agree upon, as necessary, the procedures governing the participation of the Government of the United Kingdom of Great Britain and Northern Ireland in the operations that are undertaken.

Article 9. Such activities as the two Parties may undertake under this arrangement shall be contingent, for each, upon the availability of the necessary funds.

Article 10. This Agreement shall enter into force on the date of signature. It may be terminated by either Party by three months advance written notice to the other Party sent through the diplomatic channel.

Done at Paris, on October 3, 1989, in duplicate in the French and English languages, both texts being equally authentic.

For the Government of the French Republic	For The Government of the United States of America
JEAN-PIERRE PUISSOCHET	M. PETER BERNHARDT

* This is a copy of the text of the Agreement as communicated by the Department of State.

EXHIBIT B

ANNEX

Conservation Principles
Regarding Objects Taken from the CSS ALABAMA Wreck

The committee examined the problems posed by the conservation of the artifacts resulting from the initial expeditions, paying special attention to the concerns expressed by the officials of the CSS Alabama Association, in order to assist in establishing a satisfactory procedure for the future from the dual perspective of safeguarding the artifacts and with regard to the duties of the different parties involved in the process.

The entire process of conserving and restoring the artifact discovered may be broken down into four major phases. At this point, the committee herewith proposes a description of these different phases and the scientific and financial responsibility of each of the different parties.

In general, the first and second phases discussed below can be described as field conservation. They are the responsibility of the organization (The CSS Alabama Association) that is undertaking the archeological project. The third and fourth phases shall be considered museum conservation and are the responsibility of the United States Government, which is the owner of the CSS Alabama and its associated artifacts

First phase: Collection and Registration.

This phase includes inventorying, registering, and documenting all objects excvacated from the site. This stage ca: include the first simple cleaning, necessary for identifying the objects. These functions are the responsibility of the archeologist directing the excavation.

It should be understood that no objects will be excavated unless specific authorization is granted in advance by the owner Before that authorization can be granted, the organization undertaking the excavation must submit a specific collection plat and a conservation plan for the artifacts involved. The basic principles to bear in mind are twofold: (1) that any excavation must be consistent with the collection plan of the United States Government (which receives advice on this matter from the CSS Alabama Scientific Committee); and (2) that no artifacts can be collected unless there is a conservation plan and assurance that the organization undertaking the excavation, as well as the owner, have

plans, facilities, and resources available to undertake their required conservation work.

Registration forms for the recovered artifacts shall be provided to the owner as soon as possible. Those forms shall be compatible with the accessioning procedures of the U. S. Naval Historical Center, which represents the U. S. Government on this matter. Among other elements of information, registration forms shall include data on the cleaning of the artifacts and their current location.

Second phase: Preservation

This involves the packaging and storage spaces to permit the safeguarding of the objects collected and to assure their active maintenance. A stable micro-environment suited to their conservation is recreated and maintained and the condition of the artifacts is monitored. This phase may include first aid measures when a major risk of deterioration is detected and the conservation of an object is endangered.

This phase ends with the evaluation, by the entity undertaking operations on the wreck site, of the conservation treatments necessary for the long-term safeguarding of the objects collected. This evaluation will include proposals for treatments, together with estimates of their respective costs and duration, and recommendations as to how soon these treatments ought to be undertaken and as to the laboratories able to perform the work.

The association responsible for excavation operations is responsible for this entire phase.

The proposed treatments and recommendations are transmitted to the legal owner of the objects, who makes decisions of his choices and ensures that these measures are implemented.

Third phase: Conservation treatments

Conservation treatments include all measures that will permit the lasting stabilization of the objects and their conservation, transportation, and display in the conditions to which museum objects normally are subjected. Treatments may include the processes of dechloridation or the elimination of salts, freeze drying, consolidation, and anti-corrosion treatments.

The United States Government, as the legal owner of the CSS Alabama artifacts, is responsible for assuring that conservation is undertaken in laboratories of its choice. Through mutual agreement,

the owner may assign this work to another organization, such as a museum that will receive the artifacts i question on long-term loan.

Fourth phase: Restoration

Activities related to restoration are aimed at improving the readability, visual appeal, and functional qualities of the objects and can be useful for understanding them and enhancing their cultural value. This work depends heavily on the purpose for which the objects will be used: that is, where they will be displayed. These processes may be proposed and undertaken by the legal owner; but also; the entity that is going to display these artifacts may recommend to the legal owner specific restoration measures and undertake that work at its own expense. But no restoration work may be performed without the previous agreement of the legal owner.

Appendix B - Ministry of Culture and Communication Permit

N° 001005

LA MINISTRE DE LA CULTURE ET DE LA COMMUNICATION

Vu la loi n° 89-874 du 1er décembre 1989 relative aux biens culturels maritimes ;

Vu le décret n° 91-1226 du 5 décembre 1991 pris pour l'application de la loi n° 89-874 ;

Vu le décret n° 94-423 du 27 mai 1994 portant création des organismes consultatifs en matière d'archéologie nationale ;

Vu l'avis de l'autorité prévue à l'article 7 du décret du 5 décembre 1991 susvisé, en date du 14 mai 2001 (PREMAR Manche - Mer du Nord) ;

Vu l'avis du Conseil national de la recherche archéologique (commission des fouilles sous-marines) en date du 30 mars 2001

Vu la demande présentée par M. Gordon P. WATTS

ARRETE

Article 1er :

M. Gordon P. WATTS est autorisé à procéder à une opération de fouille archéologique sous-marine pluriannuelle à partir de la date de notification du présent arrêté jusqu'au 31 décembre 2003

sur le(s) site(s) de :
Département : Manche
Commune : Cherbourg
Lieu-dit :
Coordonnées géographiques - latitude : 49° 45,17' N - longitude : 01° 41,65' W
Numéro de la carte marine : 71205
Profondeur : 60 mètres
Programme : 29

Article 2 :
Conformément à la loi du 1er décembre 1989 susvisée, l'opération est exécutée sous la direction effective du titulaire de l'autorisation et placée sous sa responsabilité.

Article 3 :
L'opération est effectuée sous la surveillance du chef du DRASSM, qui prescrit toutes mesures qu'il juge utiles pour assurer le bon déroulement scientifique de l'opération.

Le titulaire de l'autorisation tient régulièrement informé le chef du DRASSM de ses travaux et découvertes. Il lui signale immédiatement toute découverte importante de caractère mobilier ou immobilier. Les mesures nécessaires à la conservation de ces vestiges doivent être prises en accord avec lui.

A la fin de l'opération, le titulaire de l'autorisation adresse au chef du DRASSM, en double exemplaire, un rapport accompagné des plans et coupes précis des structures découvertes et des photographies nécessaires à la compréhension du texte. Il donne un inventaire de l'ensemble du mobilier découvert et signale les objets d'importance notable. Il indique quelles sont les études complémentaires à envisager.

L'ensemble des documents relatifs à l'opération (notes, photographies, relevés, correspondances, etc..) est remis au chef du DRASSM aussitôt que sont rédigés les rapports, notes ou publications scientifiques sur les recherches effectuées.

Article 4 :
Dans le cas où la présente autorisation porte sur une opération pluriannuelle, le rapport visé à l'article 3 est remis à la fin de chaque année. Le titulaire adresse, en outre, à la fin de l'opération, au chef du DRASSM, un rapport de synthèse. Celui-ci comprend l'exposé détaillé des résultats scientifiques obtenus durant l'ensemble des campagnes, l'inventaire de l'ensemble du mobilier découvert avec, signalés, les objets d'importance notable et l'indication des études complémentaires envisagées.

Article 5 :
Le chef du DRASSM fixe, au vu de l'inventaire fourni par le titulaire, le lieu de dépôt du mobilier archéologique découvert au cours de l'opération ainsi que la durée de sa mise à disposition pour étude.

Article 6 :
Prescriptions particulières à l'opération : Les opérations devront respecter les recommandations du comité scientifique CSS Alabama telles que formulées dans la résolution du 9 novembre 2000.

Article 7 :
Le Chef du DRASSM est chargé de l'exécution du présent arrêté.

Fait à Paris le 11 JUIN 2001

Pour la Ministre et par délégation,
Le sous-directeur de l'archéologie
Adjoint au sous-directeur
de l'archéologie

Ph. GRENIER de MONNER

COPIES A :
[ ] DRASSM
[ ] SDA
[ ] Préfet de département
[ ] Préfet maritime
[ ] Affaires Maritimes
[ ] DRAC - SRA
[ ] Mairie(s)

Appendix C - Project Personnel

Archaeological Investigations

American Archaeological Personnel

Gordon P. Watts, Jr., Principal Investigator
John W. Morris, Field Director
Mark Padover, Archaeologist
Jason Burns, Archaeologist
Ken Merryman, Archaeological Assistant
Curtis Deyo, Dive Safety Officer

French Volunteer Personnel

Joe Guesnon, Field Director

Jacques Flambard
Thierry Crestey
Giles Drogue
Patrick Mager
Jean-Loop Guilard
Jacques Morin
Denis Leonard
Parick Houyvet
Jean-Pierre Blougorn
Gerard Leonard
Patrice Violet
Daniel Creveuil
Jacques Lanleau
Cyril Maunoury
Pascal Prevet
Thierry Noel
Didier Sanchez
Serge Lelair
Christophe Moulin

French Navy Personnel

Pending information from Ulane

Conservation Personnel

Elise Blouet

ROV Operations

Naval Historical Center Personnel

James Schmidt

Naval Surface Warfare Center Personnel

Dana Lynn
William Lewis

American Archaeological Personnel

Gordon Watts
Mark Padover

Appendix D – Selected Equipment Specifications

Survey Vessel *Genesis*

Tech Marine Service of Great Yarmouth, UK was contracted by NHC to provide the survey vessel *Genesis* to support ROV activities on the CSS Alabama. The 10-ton Catamaran, is capable of cruising at a speed of 20-25 knots and has a fuel range of 300 nautical miles. Bridge equipment on the vessel included an Icom IC-M56 VHF radio, Kelvin Hughes compact VHF radio, Furuno 4-tone daylight display radar, Cetrek autopilot, Trimble Navtrac XL GPS, JMC V-103 color depth sounder, Cetrek Profish 12 chart plotter, and magnetic compass. The aft deck area (3-x-4.9 meters) was open to permit launch and recovery operations. Aft deck equipment included a 400 Kgs Hi-Ab crane with winch to provide a safe and effective means of launching and recovering the ROV (Schmidt 2003).

TECHMARINE

10 SOUTH QUAY, GREAT YARMOUTH, NORFOLK NR30 2QH
TEL: 44.149.372.8076

GENERAL PARTICULARS OF CRAFT

Name Of Vessel:	*Genesis Of Great Yarmouth*
Official Number:	901234
Gross Tonnage:	9.39
Length Overall:	37 feet
Breadth:	16 feet
Date Of Build:	1991
Name of Builder:	Searle & Williams
Country of Build:	United Kingdom
2x300 Bhp:	Iveco Turbo
Fuel Range:	300 Nautical Miles
Speed Over Ground:	20-25 knots
Deck Space:	10x16 feet (recently modified)

WHEEL HOUSE EQUIPMENT

ICOM IC-M56 VHF Radio
Kelvin Hughes Compact VHF Radio
Furuno 4-tone Daylight Display Radar
Cetrek Autopilot
Trimble Navtrac XL GPS Navigator
JMC V-103 Colour Depth Sounder
Cetrek Profish 12 Chart Plotter
Magnetic Compass
Individual LBC 240v A/C power points

ADDITIONAL EQUIPMENT

3-Meter Daughter Craft – 9.9 HP Johnson o/b
8kva Generator 110+240 a/c (silent running)
H.P. Air Compressor (200 Bar)
"A" Frame Gantry

PERSONNEL

Owner:	Trevor Farman
Captain:	Richard Thurlow
First Mate:	Richard Bean

Phantom III Open Frame S2 #419

Specifications

The Deep Ocean Engineering Inc. Phantom III family is based on the well established and proven Phantom platform, but marries this to new technology developed for the higher performance Phoenix systems. The result is a vehicle with the reliability of a Phantom but a computer-based expansion capacity.

1. Vehicle physical details:
    - weight: 200 lb
    - length: 60″
    - width: 34″
    - height: 24″
    - depth rating: 1000 FSW
    - Protected by stainless steel crash frame

-

2. Umbilical cable:
    - length: 550′ (can be up to 2200′)
    - diameter 0.8″
    - copper conductors: 28 (5 spare)
    - optic fibers: 2 (1 spare)
    - working load: 250 lb
    - breaking strain: 2400 lb
    - minimum bend radius: 12″

3. Thrusters:
    - forward: 2 @ 1.3 HP, providing 100 lb forward thrust
    - "vertrans" 2 @ 0.75 HP, providing 55 lb downwards thrust
    - all thrusters use replaceable cartridge shaft seals

4. Lighting:
    - 2 quartz halogen lamps, 250 W each
    - 4 position dimmer switch

5. Camera:
    - 12:1 zoom
    - 1 lux sensitivity
    - 1000m depth rated
    - greater than 460 lines resolution
    - mounted to motorized tilt platform, +/- 90° range

6. Navigation Instruments:
    - solid state magnetic compass
    - solid state rate gyro
    - depth transducer
    - pitch and roll sensors

7. Expansion:
    - 6 amps at 24VDC power in vehicle for instrumentation
    - in umbilical:
        - ♦ shielded twisted pair available
        - ♦ two power conductors available
        - ♦ one optic fiber unused
    - "hooks" for up to three more switchable cameras
    - software modification provides ultimate flexibility

8. Surface isolation transformer:
    - size:
        - height: 8″
        - width: 13″
        - depth: 9″
        - weight: 50 lb
    - power requirements:
        - 100 – 260VAC
        - 50 - 60 Hz
        - 40A @ 120V, 20A @ 240V minimum available (5KW)

9. Control Console (powered by isolation transformer):
    - splash-proof housing
    - size:
        - height: 14″
        - width: 24″
        - depth″ 16″
        - weight: 100 lb

10. Hand Controller:
    - weatherproof box
    - two heavy duty, inductive joysticks
    - switches for:
        - lights dimming
        - thruster slow
        - thruster disable
        - camera zoom
        - camera focus
        - camera manual / autofocus
        - camera tilt
    - autopilots:
        - autodepth
        - autoheading
        - autoltitude (when optional altimeter fitted)

♦

11. OSD video overlay displays:
    - heading (smooth scrolling ribbon)
    - depth
    - pitch
    - roll
    - umbilical turns
    - time
    - elapsed time
    - date
    - selected camera
    - diagnostic information (earth leak, water leak, voltages etc.)
    - additional 25 pages of text available

Scorpio Plus Digital Still TV Camera:

This latest addition to our product line is a professional digital still color TV camera that uses a 3.34 mega-pixel CCD to provide ultrahigh definition (2.048 x 1.536 pixel) still images. "Through the lens" color video output not only allows the operator to accurately frame still images, but it also can be used for video documentation. This camera features a 4 X Zoom lens (38mm to 115mm in 35mm format), the ability to download digital images in USB format without opening the camera, and corrected optics that virtually eliminates geometric and chromatic distortion. The Scorpio is perfect for applications involving underwater documentation, inspection in restricted access areas, and marine archaeology.

The NEWTLITE 200W is equipped standard with a 200W HMI osram hot-restrikable lamp. The HMI lamp delivers abundant light at 5600 degrees K for maximum color resolution. To minimize the weight of the system and support versatile mounting arrangements, the ballast system has been integrated into the light head. The NEWTLITE uses a combination electronic ballast and light head. This combination is lightweight and eliminates the multiple failure points associated with the extra cabling and bulkheads required for remotely ballasted systems. The NEWTLITE 200W supports HMI, HID, MSR, and CDM bulbs. The ballast also has the ability to be hot trimmed down as low as 100W. The NEWTLITE boasts 85% efficiency and is capable of operating from a 120 or 240 VAC, 250 VDC, or 12/24 VDC with suitable inverter.

The ability to move easily between different bulbs and voltage requirements allows the user to customize the lighting systems specification to suit their requirements. Whether the job requires the color resolution of the HMI or the long burn time economy of the CDM, the NEWTLITE can provide it all.

Mechanical Specifications

Mass:
5 lbs in Air
Less than 2lbs in water

Housing:
6061 T6 hard Anodized Aluminum

Size:
4" Diameter, Reflector 8.4", 13.5" long

Depth:
3,000 FSW (optional Housing materials for greater depths available)

Trackpoint II Plus System

Trackpoint II Plus

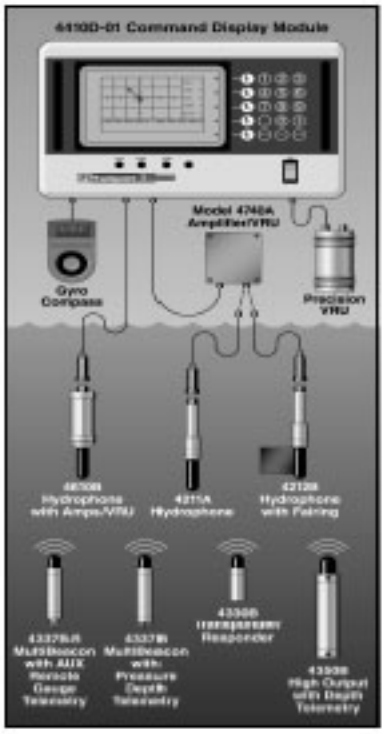
Acoustic Tracking & Navigation System

High Accuracy Data For Less Than You Would Imagine...

For over 15 years, ORE's family of Trackpoint Systems have been providing customers with highly reliable, ultra short baseline, acoustic tracking data. ORE's high accuracy Trackpoint II Plus continues this legacy offering the industry a tremendous value at a reasonable price.

The Trackpoint II Plus is the ideal tool for a wide array of subsea navigation and relocation tasks. Target types consist of transponders, responders or free running pingers.

Trackpoint II Plus presents users with a video display of the underwater position of the target or targets relative to a chosen reference point on the surface vessel. In addition to the graphic display of target position, Trackpoint II displays digital values for bearing and range to each target. A standard RS-232 connector outputs position data for each target and allows input of most keypad control functions.



The basic Trackpoint II Plus System consists of:

Model 4410D-01 Command/Display Module
Model 4610B Transducer Assembly
Model 4110B Interconnect Cable
Model 4330B Acoustic Transponder
Model 4324C Battery Charger

Features

- High accuracy; 0.5% slant range
- Compatible with other industry transponders
- Data interfaces available for third party navigation software packages
- Accepts external analog data from compasses and pressure sensors
- ORE's legendary service to support you every step of the way

Applications:

- UUV/AUV Tracking
- ROV Tracking & Navigation
- Survey / Towfish Navigation
- Subsea Structure Relocation
- Subsea Salvage Operations
- Diver Navigation
- Mooring Marking & Relocation
- Subsea Positioning
- Depth, Tilt, Heading Telemetry

ORE OFFSHORE

Trackpoint II Plus Specifications

Relative Accuracies	Horizontal Position Accuracy	0.5% RMS of slant range (+40 dB signal to noise ratio) (not including effects of heading, pitch & roll)
	Slant Range Accuracy	0.5 meter (with known sound velocity)
	Target Position Repeatability	Better than 0.25% RMS of Slant Range
	Calibrated Accuracy	Better than 0.3% RMS of Slant Range
System Resolution	Range Resolution	0.3 meters
	Bearing Resolution	0.1° (Better than 0.2% of Slant Range)
Receive	Available Frequency Bands: 8-14 kHz, 22-30 kHz, 31-37 kHz, 35-45 kHz in 500 Hz increments	
Transmit	Frequency: 4.5-30 kHz in 500 Hz increments	
Pulse Width	1-15 ms in 0.1 ms increments	
Repetition Interval	1-20 second intervals in 0.1 second increments	
Output Power	500 or 100 watts into 300 ohms	
Display Modes and Choices	Individual Target or Ship Centered Modes; Rectangular or Polar Display; North or Ship Referenced	
	Grid Scales – selectable units (meters, feet, yards); Grid Center Offset or Fish Track Mode	
External Systems Inputs / Outputs	Analog signal for pressure sensor of automatic target depth input	
	Analog compass input to allow North referenced display mode	
	Remote key pulse to synchronize system to other equipment, +TTL	
	Com 1, RS232C serial data port for system integration and output	
	Com 2, RS232C serial data port for input of NMEA compass heading	
	Remote VRU (pitch/roll) input. Offsets automatically calculated.	
	Isolate transmit trigger output for responder key pulse, (+) TTL or (-) TTL	
	Normal transmit trigger output (-) TTL level pulses for responder key or synchronization to other equipment VGA output to remote monitor	
Model 4410D-01 Command/Display Module	Size:	10.5 in. high x 17.0 in. wide x 20.0 in. deep (26.7 x 43.0 x 51.0 cm)
	Weight:	55 lbs. (25 kg)
Model 4610B Hydrophone/VRU Assembly	Size:	25.0 in. long x 6.0 in. diameter (63.0 x 15.0 cm)
	Weight:	26 lbs. (12 kg)
Model 4211A Slim Hydrophone	Size:	24.0 in. long x 2.75 in. diameter (61.0 x 7.0 cm)
	Weight:	8 lbs. (3.6 kg)
Model 4740A Amplifier/VRU	Size:	15.5 in. long x 13.0 in. wide x 6.0 in. deep (39.4 x 33.0 x 15.2 cm)
	Weight:	24 lbs. (10.8 kg)
Model 4110B Cable	Length:	100 ft. (30m) standard, other lengths available
	Weight:	35 lbs. (16 kg)
Power Requirements	Input Voltages:	97 to 132 / 170-264 VAC, 47-63 Hz, 200 watts
Temperature Ranges	Command/Display Module:	-10 to 55° C operating / -40 to 70° C storage 0-95% relative humidity, non-condensing
	Hydrophones:	-4 to 40° C operating / -40 to 70° C storage

Specifications subject to change without notice.

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TECHNICAL SPECIFICATIONS		
Weight	Base < 2.5 Kg	Pointer < 1.5 Kg
Dimensions	Base housing and mast head: 20 x 11 cm (height x diameter)	
	Interferometric frame : 20 x 30 cm (height x max. diameter)	
	Pointer: 22 x 8 cm (height x diameter)	
Materials	Base: PVC & glass fiber	
	Interferometric frame: glass fiber & aluminium (AGS)	
	Pointer: PVC & Polycarbonate	
Range	Radius up to 100 m (up to 130 m if good acoustic conditions)	
Resolution	Eadial distance : 2 mm – Angles : 0.01° (both azimuth and elevation)	
Accuracy	Distance radiale: +/- 2 cm up to 50 meters, +/- 4 cm up to 100 meters	
	Angles : +/- 0.1 ° (both azimuth and elevation)	
Measurment rate	2 seconds per point	
Memory depth	> 3000 points (data retention > 10 ans)	
Autonomy	> 8 hours in active mode (Base and Pointer)	
Charge adaptater	230 to 250 VAC (other tension on demand), charge duration < 12 hours	
Temperature range	0°C to 40°C	system operational
	0°C to 40°C	batteries charge in progress
	-20°C to +55°C	system not operational (stock)

Appendix E - Field Operations Calendar

CSS *Alabama* Campaign 2002
Field Operations Scenario

Final plans for on-site operations in 2002 could not be formulated until the last minute due to complications associated with the level of available funding and release of funds appropriated for the project. This created several adverse impacts on operations and compromised many of the research objectives. Objectives for CSS *Alabama* Field Operations during the summer of 2002 included:

1. ROV documentation of the wreck to support production of a computer model of the wreck site.
2. Diver video documentation of the wreck to support production of a site mosaic.
3. Excavation and recovery of stern pivot cannon.
4. Excavation and recovery of aft pump.
5. Excavation, documentation and recovery of galley stove.
6. Documentation of the lifting frame and propeller.
7. Test excavation within the hull aft.
8. Test excavation within the hull forward.
9. Recovery of "at risk" artifacts.
10. Video and photographic documentation of the on-site research.
11. Communication of project activities to the public.

Accomplishing those objectives was compromised by having to organize and prepare for the 2002 field operations at the last minute. The scope of anticipated operations had to be redefined several times in response to unanticipated budget changes. As a consequence of not having a firm financial commitment until weeks before on-site operations were scheduled to begin, the services of several members of the proposed project staff were lost. In addition, equipment and supplies necessary for the project could not be obtained at the last minute. Equally unfortunate, none of the equipment that was obtained at the last minute could be tested in advance of scheduled operations and personnel had no time for even the most superficial work-up dives.

Divers were not able to employ mixed gas during the operation. That alone would have increased the productivity and made more safe all of the underwater operations carried out by project personnel. The inability to obtain and test equipment compromised the proposed excavations and artifact recovery. That handicap also eliminated electronic mapping of wreck features and artifacts exposed on the bottom surface. The lack of time for obtaining and testing equipment

eliminated the possibility of controlled data collection and compromised the production of a scaled mosaic of the wreck site. Loss of the multi-beam data eliminated any possibility of establishing geo-referenced positioning for the image data. These problems were additionally complicated by weather. Numerous days were lost due to sea conditions too rough to operate safely.

The following is a scenario of the operations that were conducted:

26 May Sunday **Day -1**

Drive to Raleigh
Fly to Paris

27 May Monday **Day -2**

Fly to Paris
Drive to Cherbourg

28 May Tuesday **Day 3**

Dive planning and coordination meetings
Equipment container not released due to Williams International
Dive support vessel not to be delivered until Thursday due to weather
Make arrangements for Customs Deposit

29 May Wednesday **Day 4**

Dive planning and coordination meetings with GPD-Manche
& French volunteer divers
No equipment preparation-No equipment missed trucking schedule due to
Williams International holding up paperwork
Find out container cannot be rescheduled for trucking until Friday due to
Williams International foul up on paperwork

30 May Thursday **Day 5**

Weather Excellent, wind light seas flat
Enrica arrives 07:30
No equipment for boat as it is in the container
Dive planning and coordination meeting with US project staff
No equipment to prepare and no possible work-up dives
GPD divers place buoy(s) on wreck

31 May Friday French & GPD Dive **Day 6**

Weather Excellent, wind light seas flat

I2MR	**CNP**	**GPD**
Clear customs	Deploy baseline	Locate & buoy site
Transport equipment	Establish CNP mooring	
Prepare equipment	Site reconnaissance	

2002 Diving Operations (continued)

1 June Saturday French Dive **Day 7**

Weather Wind light with moderate seas

I2MR	CNP
Attempt test dive	Deploy Baseline
Repair pump	Attempt to relocate aft pivot gun
Dive in harbor to test equipment	sand & shell very deep in the stern

2 June Sunday Dive **Day 8**

Weather Moderate chop marginal wind

I2MR	CNP
Reconnaissance in stern	Search for galley stove
Establish mooring	

3 June Monday Dive **Day 9**

Weather Windy & rough seas

I2MR	CNP	GPD
Transport air-lifts	Search for artifacts	Transport grid parts
Assemble air lifts	Transport lift parts	Search for artifacts

4 June Tuesday Dive **Day 10**

Weather Rain & calm seas

I2MR	CNP	GPD
Compressor test fails	Search for artifacts	Locate galley stove
Work on compressor all day	Try to locate pivot gun	
Work on news release		

5 June Wednesday Dive **Day 11**

Weather Cold, rain & rough seas

I2MR	CNP	GPD
Work on compressor Pump mount	Search for at risk artifacts	Clearing stove Recover at risk artifacts
Send first news release with photographs		

6 June Thursday Dive **Day 12**

Weather Cold, rain & very rough seas

I2MR	CNP	GPD
Cancel diving	Cancel diving	Cancel diving
Work on excavation equipment		

2002 Diving Operations (continued)

7 June Friday Dive **Day 13**

Weather Cold, rain & very rough seas

I2MR	CNP	GPD
Cancel diving	Search for at risk artifacts	Cancel diving
Work on excavation equipment	Short dive/no oxygen	

8 June Saturday Dive **Day 14**

Weather Cold, partly cloudy & moderate seas

I2MR	CNP	GPD
Attempt to set up grid	Attempt to excavate on pivot gun	Cancel diving
Video documentation		

9 June Sunday Dive **Day 15**

Weather Cold, partly cloudy & threshold seas

I2MR	CNP	GPD
Video documentation	Cancel diving	Cancel diving
Assemble grid		

Interim Dive Period

10 June Monday No Dive **Day 16**

Weather Cold, partly cloudy, heavy wind & rough seas

I2MR	CNP	GPD
Work on equipment	Off	Off
Work on compressor		

11 June Tuesday No Dive **Day 17**

Weather Cold, partly cloudy, heavy wind & rough seas

I2MR	CNP	GPD
Work on equipment	Off	Off
Work on compressor		
Work on artifacts		

12 June Wednesday No Dive **Day 18**

Weather Partly cloudy, windy & rough seas

I2MR	CNP	GPD
Artifact documentation	Off	Off
Equipment repair & prep.		
Meet with NHC personnel		

2002 Diving Operations (continued)

13 June Thursday No Dive **Day 19**

Weather Partly cloudy, windy & rough seas

I2MR	**CNP**	**GPD**
Artifact documentation	Off	Off
Equipment repair & prep.		
Meet with NHC personnel in Grandcamp-Maisy		

14 June Friday Dive **Day 20**

Weather Partly cloudy, rain, light wind & calm seas

I2MR	**CNP**	**GPD**
Artifact documentation	Off	Off
Dive to test pump		
Lifts buried & hoses fouled		
Work on compressor		

15 June Saturday Dive **Day 21**

Weather Partly cloudy, light wind & calm seas

I2MR	**CNP**	**GPD**
Video documentation	Expose pivot with scooter	Off
Clear & rig air lifts	Search for mooring buoy	

16 June Sunday Dive **Day 22**

Weather Partly cloudy, wind & moderate seas

I2MR	**CNP**	**GPD**
Video documentation	Recover at risk artifacts	Off
Clear & rig grid	Try pivot with air lift	
Compressor hoses explode	Replace mooring buoy	

17 June Monday Dive **Day 23**

I2MR	**CNP**	**GPD**
Weather **wind & minimal**	**seas heavy fog on return trip**	
Video documentation	Surface artifact recovery	Bell recovery
Stern excavation		Document galley stove
Compressor hoses explode belts burn up		

2002 Diving Operations (continued)

18 June Tuesday Dive **Day 24**

Weather Partly cloudy, windy & rough seas

I2MR	CNP	GPD
Video documentation	Surface artifact recovery	Recovery of material near galley stove
Stern excavation	Excavate on pump until compressor fails	Video galley stove
Compressor chokes cannot restart		Deliver bell & rifle parts
Send news release photos of the bell		

19 June Wednesday Dive **Day 25**

Weather Beautiful, sunny, light winds & calm seas

I2MR	CNP	GPD
Video documentation	Surface artifact recovery	Document galley stove
Stern excavation		Locate surface artifacts
Examine galley stove		

20 June Thursday Dive **Day 26**

Weather Cloudy, light winds & calm seas

I2MR	CNP	GPD
Video documentation	Try to excavate prop	Surface artifact recovery
Document propellor	Recover excavation grid	
Recover air lifts	Surface artifact Recovery	

21 June Friday Dive **Day 27**

Weather Cloudy, light winds & calm seas

I2MR	CNP	GPD
Recover equipment	Recover equipment	Recover riding bitt on top of galley stove
Recover mooring	Recover mooring	Surface artifact recovery
Sink Bitt in harbor at Chanteryne	Surface artifact recovery	Recover mooring

Interim Period

22 June Saturday **Day 28**

Weather Cloudy, light winds & calm seas

I2MR

Cleaning and breakdown diving equipment

2002 Interum Operations (continued)

23 June Sunday **Day 29**

Weather Sunny, no wind & calm seas
I2MR
Cleaning, breakdown and packing diving equipment

24 June Monday **Day 30**

I2MR
Weather Wind & minimal seas heavy fog on return trip
Cleaning, breakdown and packing diving equipment
Order case for artifacts from Mainco

25 June Tuesday **Day 31**

Weather Partly cloudy, windy & rough seas
I2MR
Packing and delivery of diving equipment to Cherbourg Maritime
Dive team leaves for Paris
Work on 2003 budget

26 June Wednesday **Day 32**

Weather Beautiful, sunny, light winds & calm seas
I2MR
Copy video records
Work on 2003 budget

27 June Thursday **Day 33**

Weather Cloudy, light winds & calm seas
I2MR
Copy video records
Work on artifacts

2002 ROV Operations

28 June Friday **Day 34**

Weather Sunny, light winds & calm seas
I2MR
Preparations of ROV survey

29 June Saturday **Day 35**

Weather Sunny, light winds & calm seas
I2MR
Preparations of ROV survey

2002 ROV Operations (continued)

30 June Sunday **Day 36**

Weather Sunny, windy & moderate seas
I2MR
Drive to Grandcamp-Maisy
Preparations of ROV survey
Gyro broken in shipping
Genesis stuck in Grandcamp-Maisy

1 July Monday **Day 37**

I2MR
Weather Rain, wind & heavy seas
Settle accounts
Check on case for artifacts from Mainco
Work on revised ROV priorities
Genesis stuck in Grandcamp-Maisy

2 July Tuesday **Day 38**

Weather Rain, wind & heavy seas
I2MR
Settle accounts
Clean *Enrica*
Work on 2003/2004 plan
Genesis stuck in Grandcamp-Maisy

3 July Wednesday **Day 39**

Weather Clear, wind & heavy seas
I2MR
Drive to Le Havre to check on shipping facilities
Work on 2003/2004 plan
Genesis stuck in Grandcamp-Maisy

8

4 July Thursday **Day 40**

Weather Rain, squalls & heavy seas
I2MR
Copy video records
Work on artifacts
Genesis stuck in Grandcamp-Maisy

2002 ROV Operations (continued)

5 July Friday **Day 41**

Weather Sunny, moderate winds & moderate seas
I2MR & NHC
Preparations of ROV survey
Genesis arrives from Grandcamp-Maisy in afternoon
Meet with Steve and Dana on what we can do with the ROV

6 July Saturday **Day 42**

Weather Sunny, light winds & calm seas
I2MR & NHC
Initiate ROV survey without positioning system
Find wreck with sonar
Video and photograph forward section of wreck for 45 minutes
Try to get Trackpoint positioning system to work
Work on news release

7 July Sunday **Day 43**

Weather Rain, windy & moderate seas
I2MR & NHC
Find wreck with sonar
Video and photograph forward section of wreck for about an hour
Miss afternoon tide trying to get Trackpoint positioning system to work
Send second news release with pictures

8 July Monday **Day 44**

I2MR & NHC
Weather Rain, wind & heavy seas
Ride out to site and confirm seas too rough to launch & recover
Try to get Trackpoint positioning system to work
Check on case for artifacts from Mainco
Work on revised ROV priorities

9 July Tuesday **Day 45**

Weather Rain, wind & heavy seas
I2MR & NHC
Seas too rough to launch & recover
Clean and load *Enrica*
Work on 2003/2004 plan
Copy video records

2002 ROV Operations (continued)

10 July Wednesday **Day 46**

Weather Clear, light wind & calm seas
I2MR & NHC
Drive to Le Havre to check on shipping facilities
Work on 2003/2004 plan
Genesis returns to Grandcamp-Maisy

11 July Thursday **Day 47**

Weather Clear, light wind & calm seas
I2MR
Copy video & photographic records
Work on artifacts

12 July Friday **Day 48**

Weather Clear, light wind & calm seas
I2MR
Copy video & photographic records
Meet with Tom Adams on what we can do with the report & future coordination

13 July Saturday **Day 49**

Weather Sunny, no wind & calm seas
I2MR
Copy video & photographic records
Meet with Tom Adams on what we can do with the report & future coordination
Work on revised ROV priorities for Phase II

14 July Sunday **Day 50**

Weather Sunny, no wind & calm seas
I2MR & NHC
Copy video & photographic records
Work on revised ROV priorities for Phase II

15 July Monday **Day 51**

I2MR
Weather Sunny, no wind & flat calm
Load riding bitt in Mainco case with crane at Chanteryne
Load artifacts in Mainco case at CNP
Genesis arrives from Grandcamp-Maisy

2002 ROV Operations (continued)

16 July Tuesday **Day 52**

Weather Sunny, no wind & flat calm
I2MR & NHC
Make two ROV dives
Find wreck with sonar
Video and photograph forward section of wreck
Try to get Trackpoint positioning system to work

17 July Wednesday **Day 53**

Weather Clear, light wind & calm seas
I2MR & NHC
Make two ROV dives
Find wreck with sonar
Video and photograph forward section of wreck
Try to get Trackpoint positioning system to work

18 July Thursday **Day 54**

Weather Clear, light wind & calm seas
I2MR & NHC
With sonar team on board try to get image of wreck site but cable fails
Make afternoon ROV dives
Find wreck with sonar
Video and photograph forward and aft section of wreck
Get cable in the *Genesis* screw

19 July Friday **Day 55**

Weather Clear, moderate wind & moderate seas
I2MR & NHC
Ride out to site and confirm seas too rough to launch & recover
Copy video & photographic records
Repair umbilical
Work on news release

20 July Saturday **Day 56**

Weather Sunny, light wind & calm seas
I2MR
Make two ROV dives
Find wreck with sonar
Video and photograph forward section of wreck
Try to get Trackpoint positioning system to work
Send third news release with photographs

2002 ROV Operations (continued)

21 July Sunday **Day 57**

Weather Clear, windy & moderate seas
I2MR & NHC
Seas too rough to launch & recover
Copy video & photographic records
Genesis leaves for Grandcamp-Maisy
Talk with Bob Neyland about future of the project

22 July Monday **Day 58**

I2MR
Weather Sunny, light wind & flat calm
Load equipment at CNP and deliver to Cherbourg Maritime
Drive to Grandcamp-Maisy to talk about Multi-beam survey with Steve and Reson personnel

23 July Tuesday **Day 59**

Weather Cloudy, windy & moderate seas
I2MR
Load last equipment at Cercle Naval and CNP and deliver to Cherbourg Maritime
Drive to Paris in afternoon

24 July Wednesday **Day 60**

Weather Clear, light wind
I2MR
Fly back to Raleigh, North Carolina
Drive to Washington, North Carolina

Appendix F – Artifact Inventory

CSS Alabama Artifact Inventory 2002

Artifact Number	Material	Object
ALS-300	brass	Fill pipe, deck flange and cap
ALS-301	lead	port light sheathing
ALS-302	copper	fastener with rove
ALS-303	bronze	sleeve
ALS-304	brass	handle
ALS-305	iron & wood	spike and wood fragment
ALS-306	copper, bronze & wood	fastener, wood fragments & bronze socket
ALS-307	bronze	bell
ALS-308	bronze	bracket
ALS-309	copper, brass & wood	knighthead
ALS-310	cast iron	bitt
ALS-311	lead	port light sheathing
ALS-312	iron, brass & wood	rifled musket fragment
ALS-313	leather	shoe fragment
ALS-314	wood	rifled musket stock fragment
ALS-315	bronze	deck plate
ALS-316	bronze	gun truck block
ALS-317	copper	fastener with rove
ALS-318	ceramic	plate

Appendix F - Field Conservator's Report

Elise Blouet
Conservatrice d'objets en cuir et métal
Diplômée de la MST de Conservation-Restauration de Biens Culturels
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Saint Benoit du Sault le 27 juin 2002

Rapport de conservation in situ pour le chantier de fouille du CSS Alabama de juin 2002.

Au cours des deux périodes de plongée (du 31 mai au 9 juin et du 15 juin au 22 juin), 19 objets provenant du site du CSS Alabama ont été remontés par des archéologues américains, des volontaires français et des plongeurs du Groupe des Démineurs Plongeurs de Cherbourg.

Comme convenu, le travail du conservateur a été de répertorier, numéroter, photographier les objets ainsi que des les emballer en vue de leur transport par bateau jusqu'aux Etats Unis, où un laboratoire de conservation prendra leur traitement en charge.

La plupart des objets sont métalliques et en assez bon état, cependant ils sont recouverts de concrétions et de produits de corrosion. Il y a aussi des objets en bois, porcelaine, et avec du fer.

Tous les objets ont été mis dans de l'eau douce à leur arrivée au local. L'eau a été changée régulièrement et la concentration en chlorures a été vérifiée plusieurs fois au cours des deux périodes. Chaque objet a reçu un numéro attaché à l'aide de fil nylon, puis photographié et pour certains objets, dessiné. Un emballage avec des blocs de mousse Ethafoam, ainsi que des feuilles de polyéthylène, a été réalisé sur mesure pour les objets fragiles.

Un seul objet a posé quelques problèmes : il s'agit d'une bitte d'amarrage pour une chaîne d'une ancre, dont la taille imposante a nécessité la remise en eau, dans le port de plaisance de Cherbourg, car aucun récipient assez grand n'avait été prévu.

Malgré le petit nombre d'objets comparé aux années précédante, un objet intéressant a été remonté à la surface. Il s'agit d'une cloche et de son support en bronze trouvé sur l'avant de l'épave.

Elise Blouet

Elise Blouet
Conservatrice d'objets en cuir et métal
Diplômée de la MST de Conservation-Restauration de Biens Culturels
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Le 22 juin 2002

Liste des objets provenant des fouilles du CSS Alabama
Juin 2002

ALS 300 Tape de remplissage en cuivre.
ALS 301 Cône en plomb de hublot abîmé.
ALS 302 Cerclage de cheminée en cuivre.
ALS 303 Grande cheville traversante en cuivre.
ALS 304 Robinet et tuyauterie pris dans des concrétions.
ALS 305 Clou avec deux morceaux de bois.
ALS 306 Pivot de canon avec morceau de bois et cheville traversante.
ALS 307 Cloche en bronze sans battant.
ALS 308 Support de cloche en bronze.
ALS 309 Poulie de drisse dans son support en bois.
ALS 310 Bitte d'amarrage pour chaîne.
ALS 311 Hublot complet (plomb, verre et cuivre).
ALS 312 Fusil.
ALS 313 Chaussure gauche (cuir).
ALS 314 Crosse de fusil en bois.
ALS 315 Grande tape de remplissage en cuivre.
ALS 316 Poulie.
ALS 317 Petite cheville traversante.
ALS 318 Assiette en porcelaine blanche.

ADDITIONAL FILES TO BE INCLUDED IN HARD COPY