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# DEPARTMENT OF THE NAVY

NAVAL SEA SYSTEMS COMMAND  
1333 ISAAC HULL AVE SE  
WASHINGTON NAVY YARD DC 20376-0001

IN REPLY TO:

5720  
00D3J/2008F010081F

DEC 17 2008

This is our final response to your December 20, 2007 Freedom of Information Act (FOIA) request for electronic copies (in any available format such as pdf) of the following Salvage Reports:

Title	Date	Pages	Electronic File Available
USS Frank Knox (DDR-742) Stranding Salvage	25 Oct 1968	99	Y
Suez Canal Salvage Operations in 1974	1974	313	Y
EX-TORTUGA (LSD 26) Salvage Report	14 Sep 1989	155	Y
USCGC Mesquite Salvage Operation Dec 89 - July 90	19 July 1991	169	Y
Commercial Aircraft Salvage Operations	1 Apr 1992	74	Y
US Navy Salvage Report Operations Desert Shield/Desert Storm Vol 1	July 1992	162	Y
US Navy Salvage Report Operations Desert Shield/Desert Storm Vol II	July 1992	76	Y

We conducted a search and found documents responsive to your request. By electronic mail (email) on November 10, 2008, we explained that as an "other" category requester, you are entitled to the first 2 hours of search and the first 100 pages of duplication at no cost to you. We also informed you that fees in excess of what you are entitled to as an "other" category requester were determined to be \$186.20. By November 11, 2008 email, you forwarded a request for a total fee waiver. Due to the holiday, we received your request for the fee waiver on November 12, 2008.

Fee waivers are considered on a case by case basis. Fee waivers are typically granted to the extent that the release of the records will benefit the public. In fact, the Freedom of Information Act states that fees should be waived or reduced "if disclosure of the information is in the public interest because it is likely to contribute significantly to public understanding of the operations or activities of the government and is not primarily in the commercial interest of the requester."

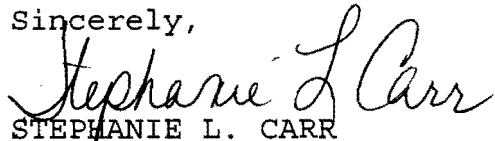
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After carefully considering your fee waiver request under FOIA, 5 U.S.C. 552, as amended, and Secretary of the Navy Instruction 5720.42E, I determined your waiver should be granted in this instance.

The seven US Navy Salvage reports were prepared by the Supervisor of Salvage and Diving, USN to provide future salvage officers and engineers with a perspective of the evolving capability of deep ocean recovery. They are cleared for public release and have always been available in hard copy upon request. The reports are enclosed in electronic format.

If you have any questions on the processing of your request, please contact me at (202)781-2433, or Ms. Roberta Petrillo at (202)781-3038 citing our case number 2008F010081. You may contact us by electronic mail at [navseafoia@navy.mil](mailto:navseafoia@navy.mil)

Sincerely,



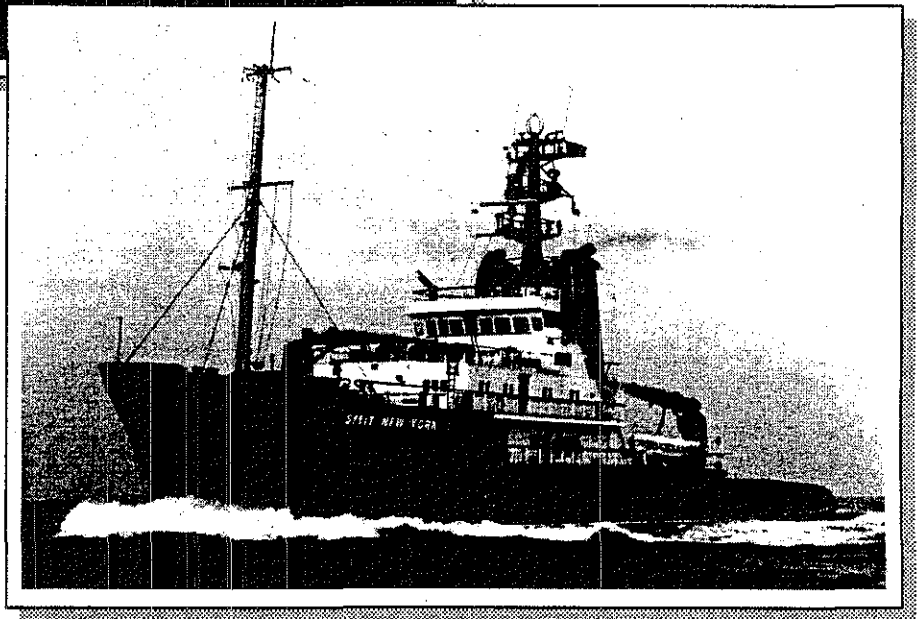
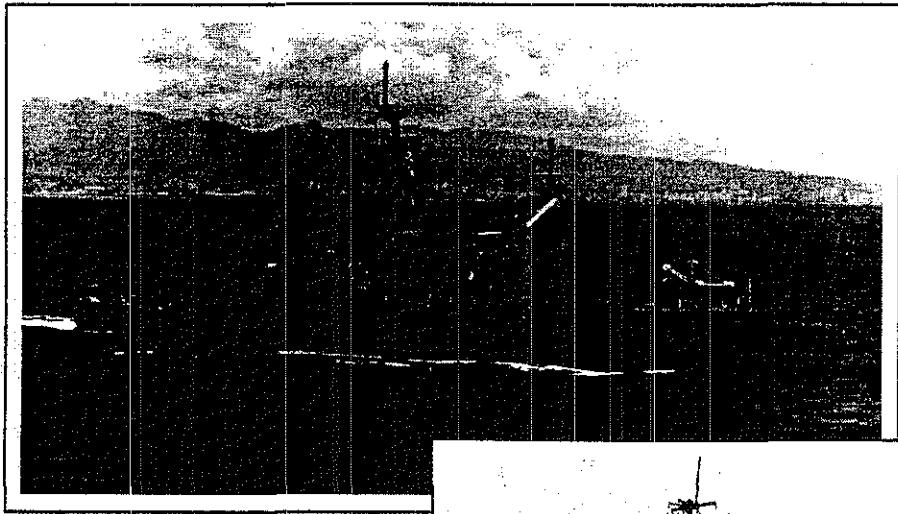
STEPHANIE L. CARR

Head, Freedom of Information  
and Privacy Act Program Office  
By Direction of the Commander

**T0800-AE-RPT-020/SUPSALV**

**0910-LP-500-6900**

**U. S. NAVY SALVAGE REPORT  
OPERATIONS DESERT SHIELD/DESERT STORM  
VOLUME 2**



**PUBLISHED BY DIRECTION OF COMMANDER, NAVAL SEA SYSTEMS COMMAND**

**JULY 1992**



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## INTRODUCTION

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In researching the salvage events of Operations DESERT SHIELD and DESERT STORM, a conscientious effort was made to personally interview the principal participants involved. The objective was to capture the thoughts, opinions and recommendations of responsible decision makers and on-scene operators. What better source exists for identifying problems, opportunities and lessons learned for ensuring an improved, more effective salvage force response capability the next time?

These documented interviews reflect the personal observations and opinions of the individuals interviewed and are provided as supplemental information to the official salvage report documented in Volume 1.

Included in this volume are the following:

- Sample interview letter.
- Sample letter returning draft writeups for comment.
- List of interviewees.
- Transcripts of the personal interviews conducted in conjunction with this report.

## SAMPLE INTERVIEW LETTER

CDR Bert Marsh, USN  
Naval Sea Systems Command  
ATTN: CODE SEA-00C2  
Washington, DC 20362-5101

Dear CDR Marsh:

Jamestown Marine Services has been tasked to assist in writing a comprehensive report documenting the total U.S. salvage involvement in OPERATION DESERT SHIELD and DESERT STORM.

The importance of this report cannot be overstated. It will not only chronicle the key salvage events of the Arabian Gulf War, identify lessons learned, and document well founded recommendations but will serve to reinforce the Navy's "total salvage system" concept for the future. This timely report, also, will complement the recently completed Supervisor of Salvage study on Navy Force Level Requirements for Salvage Ships sponsored by CNO (OP-37). The concept of salvage system resources directed by the Force Salvage Commander (FSC) will be examined, including U.S. Navy and contractor ships, as well as personnel and equipment assets from Supervisor of Salvage Operations, Mobile Diving and Salvage Units, and Emergency Ship Salvage Material (ESSM) system. The report will document salvage and towing demands and the salvage logistics support infrastructure.

This salvage report will attempt to capture the personal experiences, observations, and thoughts of individuals, such as yourself, who are considered the key players in ship survivability and salvage events that occurred. You can best identify the problems and opportunities encountered regarding the deployment and involvement of salvage forces during OPERATION DESERT SHIELD and DESERT STORM. We would like to meet with you personally during the next month, at your convenience, for an interview discussion. If your present deployment makes a personal visit impractical, we will attempt a phone interview.

Accordingly, please review the attached read-ahead material. Attachment 1 is the proposed report outline. It will give you an idea of the scope and breadth of the intended final report. We would appreciate any comments you might provide regarding the outline. Attachment 2 is a sample of the type of questions we would like you to address in the course of an interview. We will follow-up this letter with a phone call to confirm an interview time convenient to your schedule. The interview should last about one hour.

The success of this Salvage Report will impact directly upon the future role of Navy salvage as we enter the 21st Century. Your participation and input will be melded with others in the operational community to assure an effective future maritime posture supportive of our national defense objectives.

Thank you in advance for your participation in this important effort.

Sincerely,

Bruce Banks  
President  
Jamestown Marine Services, Inc.

## **ATTACHMENT 1 PROPOSED OUTLINE**

Foreword

Executive Summary

### **BACKGROUND**

- Initial DESERT SHIELD Organization
- Survey and selection of the Salvage Base of Operations
- Initial contacts and SUPSALV recommendations

### **MOBILIZATION**

- Sharjah, Base Ops (Airports, shipyards, etc.)
- ESSM equipment
- Transportation
- Military personnel
- Contractor personnel

### **SUPSALV WEST PAC CONTRACT**

- SUPSALV initial organization
- USN funding
- Netherlands, Ministry of Foreign Affairs
- SMIT-TAK involvement for initial funding
- SMIT-TAK organization, assets, and expertise
  - Tanker War
  - FiFi experience

### **U.S. NAVY BATTLE FORCE ORGANIZATION**

- SRU Det Bahrain
  - Concept of Operations (CONOPS)
    - Bluewater Salvage/Towing/Firefighting
    - Amphibious Ops Support
    - Harbor Clearance
    - TLAM recovery
- Floating assets
- Salvage organization/SUPSALV Rep or organization

### **OPERATIONAL SUPPORT**

- USNS HIGGINS
- USNS CURTIS
- USS PRINCETON (CG 59)
- USS TRIPOLI (LPH 10)
- M/V SANTA ADELA
- SH-60B Helicopter recovery
- Towing support

### **IRAQIAN PRIMARY THREAT**

- Mines/missiles

### **CONCLUSIONS**

- Lessons learned
- Recommendations

### **APPENDIXES**

- Pertinent message traffic
- Salvage assets
- Key personnel
- USN funding
  - Expenditures
- Dutch government funding
  - Expenditures

## ATTACHMENT 2

### SAMPLE INTERVIEW QUESTIONS

The following questions are intended as a point of departure to stimulate further discussion and to assist you in preparing for the interview session:

1. In what capacity, and to what extent, were you involved with salvage forces deployment and operations during OPERATION DESERT SHIELD and DESERT STORM? Did the purpose or agenda for your involvement change over time?
2. In your opinion, what were the two or three major problems encountered with regard to the deployment of salvage forces and equipment in the Mid-East region of conflict?
3. In your opinion, what were the best two or three features of our salvage force presence in the Gulf?
4. Was the Navy prepared with a concept of operations or plan for dealing with:
  - Firefighting contingencies?
  - Vessel towing?
  - Battle damage assessment?
  - Emergency ship repairs?
5. How would you characterize the salvage organizational infrastructure and interface with CENTCOM? Logistics Support Force? COMMIDEASTFOR? SIXTHFLT?
6. Was the presence of ESSM equipment adequate? If not, what type, quantity, deployment, and positioning of ESSM gear would you recommend?
7. How effective was the active Navy and contractor salvage interface in providing a "salvage system" presence?
8. In your opinion, would the Navy be well served by a continuing, long-term presence in the Gulf region? What composition? What organizational infrastructure?
9. Was there a role for MDSU/RMDSU personnel? If yes, how many?
10. If the Salvage Assistance Response Team (SART) concept were fully up and running, how would you have deploy the SART in the Gulf War?
11. What could have been done to improve salvage presence afloat and ashore?
12. What should the Navy's salvage role be, if any, in the post-war reconstruction?
13. If you were "king", what two or three changes would you implement that, in retrospect, would have made the Navy salvage forces more effective in support of OPERATION DESERT SHIELD and DESERT STORM?

## **SAMPLE RETURN LETTER**

CDR Bert Marsh, USN  
Naval Sea Systems Command  
ATTN: CODE SEA-00C2  
Washington, DC 20362-5101

Dear CDR Marsh:

It was a pleasure to interview you in support of the OPERATION DESERT SHIELD/STORM Salvage Report. The attached draft writeup is provided for your review. We have attempted to capture the salient features of your expressed views and ideas regarding salvage based on your experience and observations as SUPSALVREP to SRUDETBAHRAIN.

Please note that this is a draft version of the interview record. We would appreciate any comments or markups you might wish to make to expand, clarify, add to, or delete from the draft writeup. Space is provided after each paragraph for hand-written comments. After your review, please mail a copy of the marked-up draft to:

Jamestown Marine Services, Inc.  
101 North Columbus Street, Suite 411  
Alexandria, VA 22314

Once we have received your marked up copy, a final interview record will be prepared. Your interview, along with those of other interviewees, will provide much of the information that will comprise the OPERATION DESERT SHIELD/STORM Salvage Report.

Thank you for your interview. Should you have any questions or comments you wish to discuss by phone please contact me at (703) 360-0995 or 836-8741.

Sincerely,

John W. Allen  
Project Coordinator

# DESERT SHIELD/STORM INTERVIEW MATRIX

NAME	ADDRESS	PHONE
Asher, Richard	Naval Sea Systems Command ATTN: Code SEA-002 Washington, DC 20362-5101	(703) 607-2753
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LaPlante, John D., RADM USN	Commander, Amphib. Squadron 2 Bldg 2001 Naval Amphib. Base, Little Creek Norfolk, VA 23521-5000	(804) 464-8193
Marsh, Bert, CDR USN	Naval Sea Systems Command ATTN: Code SEA-00C2 Washington, DC 20362-5101	(703) 607-2766
Salmon, Thomas B.	Naval Sea Systems Command ATTN: Sea-00C2 Washington, DC 20362-5101	(703) 607-2758
Shepherd, Patrick, CAPT USN	Commander Destroyer Squadron Six FPO Miami 34099-4709	(803) 743-5502
Skudin, Kemp, LCDR USN	Commanding Officer USS BEAUFORT (ATS 2) FPO San Francisco 96601-3218	
Sullivan, Jack	SMIT International America, Inc 301 Route 17 North Rutherford, NJ 07070	(201) 939-2749

## Interview Report

Interviewee: Mr. Richard Asher  
Deputy Director of Ocean Engineering/  
Supervisor of Diving and Salvage  
Naval Sea Systems Command  
Code SEA 00CB  
Washington, DC 20362-5101

Interviewer: John Allen  
Jamestown Marine Services, Inc.

Michael Mulcahy  
Jamestown Marine Services, Inc.

Date: 22 May 1991      Duration: 1 Hr

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### 1. Background.

During the course of this interview, Mr. Asher provided thoughtful insight into the salvage planning and interaction of salvage events of the Gulf War as viewed from the supporting role of Supervisor of Diving and Salvage. Based on his salvage management skills, expertise, and his awareness of the circumstances in the Arabian Gulf, Mr. Asher offered an interesting perception of OPERATION DESERT SHIELD and DESERT STORM salvage problems and opportunities. The following write-up captures the highlights of the interview.

### 2. Supervisor of Salvage and Diving's Early Efforts to Establish Salvage Capability in the Arabian Gulf.

From the very start, SUPSALV's main goal was to get Navy grey hull salvage ships and active MDSUs involved in OPERATION DESERT SHIELD. Initial efforts, as early as September 1990, were focused on establishing U.S. Navy salvage ship and salvage equipment presence rather than commercial salvage assets in-theater. As part of a large hardware systems support organization in Washington, SUPSALV's initial obstacle was not having direct access to the theater operational Commander, COMUSNAVCENTCOM. The requirement for salvage force assets had to come from someone in the Fleet, not from OPNAV or NAVSEA. Issue papers were provided to VADM Arthur just prior to his assuming command of SEVENTH FLEET and USNAVCENTCOM.

Eventually, USNAVCENTCOM staff did make an inquiry as to the availability of PACFLT salvage ships. CINCPACFLT responded that no ship assets were immediately available but could be available at a later date, which as events developed, would have been late in the action. Salvage was not getting much attention. Shortly after reporting aboard in mid-December 1990, NAVSEA 00C called on OP-37 to meet CAPT Manley and discuss intentions of sending a reserve Navy Captain to the Gulf to coordinate the ESSM operation planned at Sharjah, U.A.E. and to interface with the fleet. CAPT Manley suggested sending an active duty Captain with a strong operational salvage background. The question of whose responsibility it was to do what, surfaced as a fundamental problem. Supervisor of Salvage's role is to oversee Navy salvage capabilities and at the Fleet's request, provide technical salvage assistance, and contract for required commercial salvage assistance. Consequently, this first goal was largely unsuccessful, with only USS BEAUFORT (ATS 2) and a few salvage officers arriving in-theater. However, SUPSALV was instrumental in arranging for commercial salvage assets to help offset the lack of committed organic assets.

SUPSALV's second goal was to get ESSM gear in the Gulf Theater. Under SUPSALV's initiative, Jim Bladh (00C22) went to the Gulf and through discussions with COMNAVLOGSUPFOR, convinced them that they needed to position ESSM equipment in-theater and have a salvage response capability, organic or otherwise. Jim Bladh was successful in meeting with Admiral Sutton and his staff and getting COMNAVLOGSUPFOR to request, via CINCPACFLT, the positioning of ESSM gear in-theater. This goal was achieved with "fire house ready" salvage equipment air transported to Sharjah, U.A.E. and warehoused in a Rockwater International facility and logistically supported under the SMIT contract.

SUPSALV's third goal was to get contracted emergency salvage assets in-theater if the first goal of active organic Navy salvage assets fell short. This goal was successfully met, due largely to the help of CAPT Delaplane who was in-theater and coordinated operational requirements with the available commercial salvage assets. The assets available were capable of responding to more than what the Navy was actually tasked to do. Fortunately, events were much more in our favor than expected but there was potentially a far greater demand for emergency salvage.

### **3. Difficulties in Using Peacetime Emergency Salvage Funding for Mobilization and Wartime Demands.**

NAVSEA 00C is centrally funded for emergency ship salvage for Navy ships. Its a small amount of "reactionary" funding in that it covers the costs for the most readily available commercial response when a Navy salvage response capability is not immediately available. Funding availability does not include hiring commercial salvage ships to standby in case a Navy ship runs aground or is battle damaged. Worldwide salvage contract vehicles are in place but no funding is committed until a specific tasking occurs. The emergency salvage fund is seldom sufficient to cover costs, and the sponsor generally augments the funding.

Because organic fleet salvage assets were not deployed to the Gulf, the only viable fall back position was to provide commercial salvage assets through the SUPSALV contract vehicle with SMIT INTERNATIONAL. This, in effect, applied a contract intended for salvage response to naval vessel marine casualties in peacetime to the conditions and optempo of mobilization and wartime. The principal drawbacks to using commercial salvage assets in a mobilization and war environment is the upfront funding requirement and cost escalation as the combat risk level increases. No single OPNAV sponsor wanted to pay for another's salvage need. OP-03 was not paying for aircraft recovery, which is an OP-05 responsibility with funding provided to NAVSEA via NAVAIR. TLAM recovery operations, involving three different contractors, were paid for with funding provided by the Joint Cruise Missile Project Office (JCMPO). Salvage funding was highly visible to the Fleet customer, to the point of being a singular criticism compared to the "invisible" funding support of other requirements both within the Navy and among the services. Had organic salvage assets been used instead of commercial assets, the actual costs may not have been much different, but they are viewed as costs that are invisible to the Battle Force Commander.

The fact that the Dutch Government provided approximately \$2.0M was not a factor in relying heavily on commercial salvage assets and light on organic. It was an expediting factor in making SMIT NEW YORK the first salvage ship on-scene and available.

Once the SRU DET Bahrain (CTU 151.12) was formally tasked as Force Salvage Coordinator, numerous kinds of requests were coming in. CTU 151.12 wanted salvage capability without the concern for where the money was coming from to pay for it. SUPSALV was concerned with what was billed and who would pay for the commercial salvage services being requested. These concerns were brought to OPNAV's attention. OPNAV's immediate response was to reprogram funds, the first action of which was to transfer a sizable amount of Salvage Depot (ESSM) funds to emergency salvage funds. Additional demands required reprogramming of other OPNAV sponsored program resources for this higher-priority salvage requirement with the intent of requesting special augmentation from Congress later in FY91, after the war was over. In fact, this did happen.

At one point, CTU 151.12 wanted to directly control SMIT-TAK salvage assets in support of his salvage-maintenance-repair mission. This would have been unmanageable from a contracting point of view and possibly illegal, violating the Anti-Deficiency Act that safeguards against contracting without committed funds.

In a wartime situation, such as that experienced in OPERATION DESERT SHIELD/STORM, in which both combat and noncombat salvage emergencies occurred, SUPSALV was able to manage commercial salvage assistance through the emergency salvage funding account. Essentially, the SUPSALV representatives assigned to SRU DET were authorized to make contract commitments for emergency salvage, which gave CTU 151.12 direct control with built-in safeguards for NAVSEA, ensuring that tasks were bona fide emergency salvage-related.

#### **4. Integration of Salvage into Fleet Planning.**

It would appear that salvage was not included in the Fleet OPLANS and OPTASKS. Otherwise, grey-hull salvage ships and MDSUs would have deployed to the Gulf. ESSM gear was inserted into the Transportation Priority Force Deployment Data (TPFDD) as a last-minute effort and all 650,000 lbs. had to be flown in aboard 15 C141 aircraft. The air shipments occurred just prior to the start of OPERATION DESERT STORM on 16 January. Because it was a last-minute, low-priority requirement, the lift probably would not have made it two weeks earlier or a week later. Timing of the shipment fortunately seemed to occur during a lull in the air-shipment requirements window.

ESSM is intended to be an objectively determined augment of equipment primarily to support MDSUs, and augment salvage equipment on-board Navy salvage ships and commercial salvage equipment on contract vessels. ESSM needs to be integrated into Fleet OPLANS.

#### **5. Organic VS Nonorganic Salvage Capability.**

If he were the Salvage Fleet Coordinator, Mr. Asher would have preferred the ATS and two ARS 50s rather than the SMIT NEW YORK salvage tug, because Navy salvage ships are designed as combat salvage vessels. A Navy salvage ship has a far greater chance of surviving a mine strike and continuing to conduct salvage than the SMIT NEW YORK, which probably would be lost. There are some functions, such as point-to-point towing outside the combat zone, for which commercial salvage tugs are more suitable and capable. The SMIT MADURA, with a special firefighting package aboard, was the best-equipped offship firefighting vessel in the Gulf; better equipped than any Navy salvage ship. For the other afloat towing and salvage assets that may be required, Navy organic assets are much preferred over the small commercial tugs and offshore supply boats that were available at inflated costs in the Gulf.

There is a good case for having a primary organic combat salvage response capability augmented by a non-combat commercial ship capability. If USS PRINCETON had gone hard aground after the mine strike, the decision for SMIT NEW YORK to go into mined waters or under hostile gunfire would have been made back at SMIT INTERNATIONAL Headquarters in Rotterdam, and not by the ship's master or the Navy Salvage Coordinator. In spite of stated opinions of SMIT's willingness to go in harm's way, it is difficult to say what the outcome of such a decision would be until it actually happens. The financial and liability issues are considerable. With organic assets such as USS BEAUFORT, there are no issues; and the decision to save a salvable billion-dollar warship is greatly simplified. BEAUFORT has a sizable crew, including divers and full communications package and damage control features, none of which is inherent to commercial salvage tugs.

As Salvage Coordinator, Mr. Asher would also want a dedicated Salvage Engineer/Naval Architect, readily available on-scene with the battle group, ready to respond as salvage situations arise. CDR Bert Marsh and the USS PRINCETON incident exemplify the value of having a salvage EDO readily available in contrast to the 2-3 day wait for the SEVENTHFLT Salvage officer to arrive on-scene for the USNS ANDREW J. HIGGINS grounding incident. The "Salvage System" of the future should include the requisite level of stability and structural integrity expertise that an EDO Salvage officer provides.

## Interview Report

Interviewee: LCDR David Balk  
Project Engineer  
Naval Sea Systems Command  
ATTN: SEA-00C56  
Washington, DC 20362-5101

Interviewer: John Allen  
Jamestown Marine Services, Inc.

Michael Mulcahy  
Jamestown Marine Services, Inc.

Date: 23 April 1991    Duration: 2 hours

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### 1. Background.

During the course of this interview, LCDR Balk provided thoughtful insight into the salvage planning and interaction of salvage assets as seen from the perspective of the support role played by the Supervisor of Salvage. Based on his ship husbandry expertise and direct participation in events in the Arabian Gulf, LCDR Balk offered an informed perception of OPERATION DESERT STORM/DESERT SHIELD salvage successes, problems and opportunities. LCDR Balk's initial assignment was to coordinate Navy underwater ship husbandry activities in the Arabian Gulf. Over time the needs of the Navy caused this assignment to evolve and include activities more directly related to ship salvage. LCDR Balk was the only NAVSEA 00C representative whose time in the Arabian Gulf spanned the entire time that 00C was involved in OPERATION DESERT SHIELD/DESERT STORM.

### 2. "Contract Salvage" Issue.

NAVCENT felt that salvage should be contracted out. Reasons included the fact that SUPSALV already had a commercial contract in place with SMIT, and the feeling that a precedent existed, since salvage was handled that way in the Iran-Iraq "Tanker Wars". This theory fell down once the Arabian Gulf was declared a war zone. The major difference between the two wars was that in the Iran-Iraq wars mines were not a factor. Quite a few tugs sustained missile hits, but these could be anticipated and constituted an acceptable commercial risk, particularly in view of potential payoff by claims to salvaged cargo.

In Operation Desert Shield/Desert Storm there was no commercial incentive. Mines were a significant threat. Grey hulls offered no prospect of recovery of cargo value by commercial salvors. Instead, these salvors would have to work for the daily rate—not attractive under the circumstances. When the first tugs returned from Khafji and reported the mine threat, the commercial tug volunteer list disappeared. A further deterrent to commercial salvage activity was the chemical/biological/radiological (CBR) threat.

### **3. Siting ESSM Base in Sharjah.**

Two factors influenced the decision to set up the ESSM base at Sharjah. SMIT-TAK already had an office there. An economic driver of the decision was the fact that any operations west of 55° E qualified for crew war premiums. Sharjah was near the "war zone" without actually being in it. A further justification for choosing Sharjah was the need to keep the Strait of Hormuz open, since it is the only means for shipping to transit into and out of the Gulf. If Iran had entered the war on the Iraqi side, as appeared likely at the outset, U.S. allies in the U.A.E. would have been in direct conflict with Iran, and the Strait would have been threatened with closure.

### **4. Selection of ESSM Gear.**

ESSM equipment specified by the SUPSALV staff turned out to be adequate for the demands placed on it by the war. Some 3" pumps were the only ESSM gear used, dewatering the sunken Iraqi OSA II missile boat and several other small boats and barges in the vicinity of Mina Ash Shuaibah. There were no pre-defined salvage CONOPS. Therefore, based on long experience, SUPSALV made assumptions and specified equipment that appeared likely to be required. If equipment brought had been insufficient, CTF 63 would have provided additional resources.

### **5. Salvage Communications.**

The communications link between contractor assets and Navy assets was troublesome. Normal commercial radios cannot use dedicated military frequencies. The problem was solved by modifying the commercial radio aboard SMIT NEW YORK so that it could pick up a single military frequency. Secondly, an INMARSAT SATCOM radio was installed aboard SMIT NEW YORK, the contractor flagship, and USS BEAUFORT (ATS 2). BEAUFORT was the main point of contact, through which SMIT NEW YORK could communicate to any USN vessel. The combination of the INMARSAT and the modified radio also enabled communication with SRUDET Bahrain, which was coordinating all battle damage repair and salvage requirements.

### **6. CONOPS.**

Decision-makers often were surprised at the mention of salvage. As a result of misconceptions within the Navy regarding what salvage was all about, salvage considerations never got written into Fleet CONOPS. Therefore, services such as offship firefighting were difficult to sell to the Fleet.

SRUDET Bahrain encountered considerable opposition to salvage on the staffs of both NAVCENT and NAVSUPFOR. Initially, NAVSUPFOR did not consider EOD, UCT or salvage as important. Eventually they recognized EOD and UCT as valid requirements, but rejected salvage. We argued that harbor recovery/clearance could easily require salvage services if the enemy sank vessels in the channel or pierside, eliminating access to and use of deepwater berths vital to follow-on through-the-port logistics support for the Marine Corps and Army ground forces.

## 7. Problem Areas.

At the lower Navy echelons, many seemed not to believe that a war was going on. The attitude was one of "business as usual." Hard-copy tasking and funding identification were required before any work could be performed. This practice slowed response time. A peacetime audit trail was imposed on a wartime situation. The Navy battle force commanders did not appear to become concerned about salvage until USS PRINCETON (CG 59) took the mine hit on February 18, 1991.

The NAVCENT staff had unrealistic expectations regarding the speed of evolutions such as mine clearance and salvage. For example, a staff member would say NAVCENT wanted a lane cleared in three days, whereas mine clearance personnel knew that the job would require 10 days. This applied as well to time allotted for salvage.

SUPSALV failed to advertise sufficiently within the Navy all that our salvage capabilities include. There appears to be no one familiar with salvage on the Fleet Operations and Planning staffs who could incorporate salvage scenarios into Fleet exercises. Salvage ships are owned by the Fleet, and are used for many purposes besides salvage (e.g., towing targets, performing general tug duties). Without greater involvement in Fleet exercises, current salvage capabilities and limitations cannot be known by potential users in the Fleet. When the salvage fleet cannot respond to a salvage call in a timely fashion, the standard approach is to contract for salvage services. SUPSALV tries to give the Fleet first right of refusal, and the Fleet usually refuses. When the USN does not use its Fleet assets for salvage very often, the Navy at large does not tend to know what salvage capabilities exist in-house. Therefore, Fleet assets are usually considered as an afterthought, if at all.

It became clear during the war that the Navy does not have its harbor recovery/clearance act together. There is a general lack of awareness that these activities include more than EOD. MDSUs and UCTs. MDSUs and UCTs are unknown quantities in the Fleet. A major problem lies in the absence of integrated MDSU/UCT/EOD training exercises. Although these teams have some awareness of each other's talents, the groups have not practiced enough to have C<sup>3</sup> aspects in place. The components [of a joint salvage force] are there, but are not yet integrated.

A salvage CONOPS should be well-known at the Fleet level. Also, in the logistics chapter of an OPLAN, salvage needs to be addressed, drawing on the integrated skills of MDSU/UCT/EOD communities.

The US Army brought over 100-ton floating cranes, which were very workable. The Navy's MDSU and UCT teams do not have such assets. For salvage, we rely instead on salvage ships with cranes and booms, hinging everything on the availability of these platforms. We have no LCUs set up for diving support, as the Army does, although the MDSUs and UCTs have a variation of this in their FADS modular equipment.

## 8. Opportunities and Successes.

Evolutions in which the Navy participated went well. Fortunately, we never had a requirement for a multiple tug/salvage operation. We (in SRUDET Bahrain) tried to plan for a multiple-casualty contingency, but never got the assets in place. Although it was fortunate that no catastrophic incident (e.g., beaching or hard grounding) occurred, such a casualty might have helped our salvage cause in general. If the amphibious invasion had taken place, we would have had our hands full—no matter how many assets we had in-theater.

## 9. Lessons Learned.

Salvage should have been included in Fleet operational command CONOPS at the outset of the war. There should have been an O-6 on the NAVCENT staff, who could direct floating assets (e.g., USS BEAUFORT and whatever other salvage ships came in-theater), oversee MDSUs and contractor operations, and implement salvage CONOPS. Salvage should fall under an operational command, vice logistics or maintenance command.

A salvage organization should have been stood up using all-organic Navy assets, augmented by contractors, vice the reverse. All-Navy assets enable direct command/control; direct Fleet C<sup>3</sup> interface; and assurance that salvage platforms will go into harm's way.

Standing up<sup>1</sup> a mini-SUPRON under one of the operational commands (e.g., CTF 151) would have worked well. Required assets would have been available—salvage ships, MDSUs, and ESSM gear, with contractor assets in standby.

It became clear during the war that the Navy does not have its harbor recovery/clearance act together. There is a general lack of awareness that these activities include more than MDSUs and UCTs. A major problem lies in the absence of integrated MDSU/UCT/EOD training exercises. Although these teams have some awareness of each other's talents, the groups have not practiced enough to have C<sup>3</sup> aspects in place. The components [of a joint salvage force] are there, but are not yet integrated.

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<sup>1</sup> Standard Fleet terminology.

## **Interview Report**

**Interviewee:** Mr. Jim Bladh  
Supervisor of Diving and Salvage  
Naval Sea Systems Command  
Code SEA 00C22  
Washington, DC 20362-5101

**Interviewer:** John Allen  
Jamestown Marine Services, Inc.

Michael Mulcahy  
Jamestown Marine Services, Inc.

**Date:** 22 May 1991      **Duration:** 1 Hr

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### **1. Background.**

During the course of this interview, Mr. Bladh provided thoughtful insight into the salvage planning and interaction of salvage events of the Gulf War as viewed from the supporting role of Supervisor of Diving and Salvage. Based on his knowledge and skills as a salvor and contracts administrator for SUPSALV and his early presence in the Arabian Gulf, Mr. Bladh offered an interesting perception of OPERATION DESERT SHIELD AND DESERT STORM salvage problems and opportunities. The following write-up captures the highlights of the interview.

### **2. Supervisor of Diving and Salvage's Early Efforts to Establish Salvage Capability in the Arabian Gulf.**

Mr. Bladh's involvement in getting salvage assets in the Gulf began in the late fall and was initially focused on three central issues:

1. Utilization of SUPSALV's contract with SMIT International as a direct conduit for accommodating the desire on the part of the Dutch Government to contribute to the war effort with financial support for salvage operations in the Gulf
2. Working with the CTF 63 Salvage Officer to first bring a ship husbandry capability to the Gulf and use it as an opener to bring in operational salvage assets and capability
3. Establishing an ESSM base in the Gulf to support organic and contract salvage assets.

Mr. Bladh's 45+ years Naval experience has provided the Navy with an energetic and knowledgeable salvage operations expert. His no-nonsense and direct approach made him the ideal first SUPSALV representative to go to the Gulf in early December to discuss salvage with COMNAVLOGSUPFOR and COMUSNAVCENT and lay the groundwork for positioning salvage assets in the Gulf region, and resulted in a NAVCENT message requesting ESSM salvage equipment based in Sharjah, U.A.E. The following significant events resulted in Mr. Bladh successfully addressing the above issues and obtaining co-funding for commercial salvage tugs and special equipment including establishing a Navy ESSM base in the Gulf.

In late November 1990, Mr. Bladh met with SMIT International to coordinate a grant of approximately \$ 1.0M from the Dutch Government through the Ministry of Foreign Affairs, as a no-cost delivery order in SUPSALV's Westpac Zone contract with SMIT.

On 10 December 1990 he traveled to Singapore to work out the details for incorporating the Dutch-funded delivery order requirements into the SMIT-TAK contract.

On 14 December Mr Bladh arrived with Mr. Roger Elliott, Assistant General Manager, SMIT-TAK, in Dubai, U.A.E., to inspect prospective sites and facilities for an ESSM base.

On 15 December, he proceeded to Bahrain to meet with RADM Sutton, Commander Naval Logistics Support Force, and NAVCENTCOM staff to discuss the availability of SMIT NEW YORK and the necessary Navy ESSM equipment to support contract salvage efforts.

Mr. Bladh departed the Gulf area on 17 December, returning to Washington via Singapore on the 23 December with confidence that NAVCENT would send the message that he had drafted, requesting the salvage services of SMIT NEW YORK under the NAVSEA contract. In conversation with NAVCENT Chief of Staff and Logistics DCS, he had emphasized that with SMIT NEW YORK arriving around 5 January 1991 and with USS BEAUFORT (ATS 2) enroute from WESTPAC, there was still a need for a couple more salvage ships. The Logistics Officer felt that the SMIT vessel was sufficient and that Navy salvage ships were not required.

### **3. The Site Selection for the ESSM Operation Base in Sharjah, U.A.E.**

The logic behind siting the ESSM base in Sharjah vice Bahrain (farther north) was based on several factors:

- SMIT already had a joint-venture agreement with Rockwater International who had offices and warehouse facilities in Sharjah. Rockwater had a effective organization in place and an established working relationship with the local authorities and logistics infrastructure.
- Accessibility to the warehouse facility and the waterfront was less complicated than in Bahrain, where there was a higher tempo of activity, a denser population of Naval logistics personnel, material and equipment and more stringent security.
- Responsive direct airlift to and from the "Mirage" military airfield just outside of Sharjah which was the delivery point for the 325 tons of ESSM equipment that arrived in mid-January aboard fifteen C-141 flights.
- Sharjah offered a broad range of port facilities, including ample pier and wharf berthing and drydock facilities.

#### **4. Major areas of Concern.**

In retrospect, it was probably a mistake to send the message to NAVCENT just prior to the arrival of CDR Marsh and CAPT Delaplane in the Middle East that was critical of NAVCENT's earlier stated position of having an adequate salvage infrastructure in place. A more diplomatic approach would have been to wait until they had arrived and arranged a meeting to discuss what salvage assets and capability CAPT Delaplane and CDR Marsh could provide through CTU 151.12. As it was, they seemed to have forfeited the opportunity to meet directly with NAVCENT, possibly due in part to the criticism in the NAVSEA message.

A major concern was that there was no one assigned to any of the major staffs who had knowledge, experience or even an awareness of the potential for marine accidents and battle damage requiring a salvage response capability. It really didn't hit home until the HIGGINS' grounding. COMNAVLOGSUPFOR staff had no concept of salvage, and therefore it was imperative that Admiral Sutton himself be briefed on the salvage concerns and availability of assets. Initially, the staff was against positioning ESSM equipment in Sharjah. Admiral Sutton greatly appreciated the briefing and proposed concept of commercial salvage assets funded mostly by The Netherlands and was instrumental in getting Messrs. Bladh and Elliott in to see the NAVCENT Chief of Staff, CAPT Smith, and DCS for Logistics, CAPT Hendricks.

Another apparent problem was the issue of funding and the visibility of this issue in the Fleet. The perception on the part of others that funding and the strict "business-as-usual" contract approval and accountability process inhibited the Fleet's control of salvage assets was due in part to misunderstanding and a breakdown of communications. CTU 151.12, CAPT Shepherd, had a NAVSEA staff salvage engineer and an experienced fleet salvage officer, both with COTR authority, temporarily assigned to his staff and ready to respond to any salvage situation. The intent was "ask and you shall receive" and the hastily-arranged salvage support infrastructure was set up to respond to whatever was requested. CAPT Delaplane, a highly respected and experienced salvor, was in a position to respond to any salvage demand critical to the war effort, unimpeded by funding. Funding was the responsibility of NAVSEA HQ staff OPNAV resource sponsors and should have been invisible to the Fleet. CAPT Delaplane would inform SUPSALV, concurrently or after-the-fact, of what salvage had occurred. NAVSEA, having promoted the use of contract salvage assets to respond to both combat and noncombat salvage demands in a wartime environment, was in a Fleet supporting role, not a directing or controlling role.

After the cease-fire the demand for combat salvage support greatly diminished, and was limited to response to the mine threat. Noncombat salvage demands, such as marine casualties (e.g., grounding, collision, and fire), downed aircraft and TLAM search and recovery operations, and harbor clearance/port reconstruction were considered normal peacetime salvage operations and treated as such. Criticality was a judgment call by the appropriate sponsor. When the decision was made that there would be no amphibious assault and later when the cease-fire was in effect, harbor clearance and port restoration/reconstruction became a Kuwaiti government and State Department call.

#### **5. Summary Remarks.**

A salvage support capability, albeit late in getting mobilized to support OPERATION DESERT SHIELD, was in place and ready to respond at the start DESERT STORM. Commercial salvage assets, backed by ESSM equipment, provided the primary on-line salvage response capability until USS BEAUFORT arrived and took the operational lead with support from the SMIT salvage tugs, and subcontracted support vessels.

## Interview Report

Interviewee: Mr. Keith Cooper  
Operations Specialist  
Naval Sea Systems Command  
ATTN: SEA-00C22A  
Washington, DC 20362-5101

Interviewer: John Allen  
Jamestown Marine Services, Inc.

Michael Mulcahy  
Jamestown Marine Services, Inc.

Date: 22 May 1991      Duration: 45 min.

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### 1. Background.

During the course of this interview, Mr. Cooper provided thoughtful insight into the planning and interaction of salvage assets in operations to conduct search and recovery of a number of Tomahawk Land Attack Missiles (TLAM) and an SH-60 helicopter from the floor of the Arabian Gulf. Based on his deep-ocean search and recovery operations expertise, Mr. Cooper offered an informed perception of salvage successes, problems and opportunities in the aftermath of Operation Desert Storm.

### 2. TLAM Recovery.

SUPSALV was funded by the NAVSEA Joint Cruise Missile Project Office to locate, identify and recover a number of ship-launched TLAMs from the bottom of the Arabian Gulf. The original tasking specified detonating the missiles in place, but the plan was changed to recovering missile fragments in order to reconstruct possible causes of malfunctions. The recoveries were accomplished in conjunction with a second operation, to recover a U.S. Navy helicopter which had gone down in the same general area as the TLAMs. Mission duration was 20 March to 10 April 1991. Operations were staged from USS BEAUFORT (ATS 2). In addition to ship's company, participants included personnel from SUPSALV, including Mr. Cooper; SUPSALV's search and recovery contractors Eastport International and Oceaneering International, Inc.; and a U.S. Navy EOD detachment.

The TLAMs had failed in the early stages of ignition. Located in four separate areas, the missiles of interest had been launched from three U.S. Navy vessels—two destroyers and one cruiser.

Operating depths were in the region of 225 feet.

The MiniRover™ Remotely Operated Vehicle (ROV) worked in tandem with divers. An ROV's virtually unlimited endurance made it ideal for bottom reconnaissance of debris fields. Once locations of fragments of interest had been mapped, divers rigged and recovered them. In this way, diver bottom time was used most productively. The size of missile fragments varied; some missiles were more than 50% intact. During this operation, recovery teams incidentally discovered a number of mines suspended in the water column. The mines were reported to appropriate authorities and left undisturbed.

With the EOD team aboard, the SUPSALV contingent was capable of a broad range of action—search, identification, recovery, defusing and detonation. Detonation was never required.

### **3. SH-60 Helicopter Recovery.**

Recovery of the helicopter was facilitated by the fact that it carried an acoustic beacon, or pinger—regarded by SUPSALV personnel as unusual, since the craft had been operating under tactical conditions when it crashed. Based on input from one of the helicopter's crew and other squadron personnel, BEAUFORT was positioned within approximately 200 yards of the helicopter's point of entry. An EOD diver with a hand-held pinger locator system found the helicopter immediately. BEAUFORT went into a two-point moor. Divers secured an 8" hawser around a rotor, and BEAUFORT's boom lifted the craft to the surface. Once the helicopter was at BEAUFORT's side, the vessel shifted the load to its crane and lifted the helicopter aboard. Elapsed time from BEAUFORT's arrival on station to securing the recovered helicopter on deck was only 11 hours.

## Interview Report

Interviewee: CAPT Steve Delaplane, USN (1140)  
16 Kirby Court  
Poquoson, Virginia 23662

Interviewer: John Allen  
Jamestown Marine Services, Inc.

Michael Mulcahy  
Jamestown Marine Services, Inc.

Date: 31 May 1991      Duration: 2 Hrs.

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### 1. Background.

During the course of this interview, CAPT Delaplane provided thoughtful insight into the salvage demands and events of the Gulf War from his first hand experience while serving as the senior Salvage Officer in the Gulf War Theater. Based on his experiences and his long professional involvement with and knowledge of operational salvage and diving, he offered an interesting perception of OPERATION DESERT SHIELD AND DESERT STORM salvage problems and opportunities. The following writeup captures the highlights of the interview.

CAPT Delaplane was attached to CINCLANTFLT staff in temporary duty status when he was tasked to proceed to the Gulf for duty as Salvage Officer and advisor to the COMUSNAVCENT organization. Specifics were not initially known when he was first contacted by CAPT Jerry Manley, USN (1140), OPNAV (OP-36), Director, Surface Warfare Ship Readiness Division on 22 December 1990. CAPT Manley, in a prior discussion with CAPT R. Fiske, USN (1400), NAVSEASYSKOM, Supervisor of Diving & Salvage, had strongly recommended sending an active-duty Captain rather than a reserve Captain as SUPSALV had planned. Passing through Washington, DC for discussions with OPNAV and SUPSALV and drafting of a salvage issue paper, he departed on 10 January 1991, arriving in Bahrain with orders to report to Admiral Robert Sutton, USN (1110) Commander Naval Logistics Force (COMNAVLOGSUPFOR), CTF 153.

Shortly after arriving and reporting in on 11 January, CAPT Delaplane went to Sharjah, U.A.E. to make an ESSM Base site visit and to meet Mr. Roger Elliott, Assistant Managing Director of SMIT-TAK, Singapore, and senior SMIT representative in the Gulf. SMIT International was under omnibus contract with SUPSALV for the Western Pacific Zone. He wanted to discuss the status of SMIT NEW YORK, currently on hire in accordance with Task Order No. 2, inquire about other locally available vessels, and discuss an evolving concept using commercial assets to support anticipated salvage contingencies.

On 14 January, CAPT Delaplane returned to Bahrain to call on VADM Stanley Arthur, USN (1300), Commander U.S. Navy Central Command (COMUSNAVCENT), CTF 150, his Chief of Staff, CAPT Smith, and DCS for Logistics, CAPT Hendricks, SC, USN who was the designated staff salvage coordinator. Unfortunately, CTF 150, embarked on USS BLUE RIDGE, had departed the previous day. Concurrently, the Fleet salvage responsibility shifted from COMNAVLOGSUPFOR to CAPT Pat Shepherd, USN (1110), OIC Ship Repair Unit Detachment (SRUDET) Bahrain, normally under the operational control of CTF-63, but under the local OPCON of Commander Middle East Force (COMIDEASTFOR), CTF 151. SRUDET Bahrain was not a designated numbered task force group and consequently was largely overlooked and out of the communication loop. It wasn't until 25 January, 10 days into the war, that CAPT Shepherd flew out to the CTF 151 flagship to lay out the salvage concept and convince the staff that salvage and BDR warranted designation as CTG 151.12.

While in Bahrain, CAPT Delaplane attended an amphibious assault briefing given by RADM John B. LaPlante, USN (1110), Commander Amphibious Task Force, CTG 156. An amphibious assault became a principal contingency concern in developing a Salvage Concept of Operations.

On 16 February, RADM R.A.C. Taylor, USN (1110) relieved RADM William M. Fogerty, USN (1110) as COMIDEASTFOR/CTF 151, marking the beginning of a more proactive salvage role by CTF 151 and resulted in increased tasking for CTG 151.12. In a subsequent meeting with CAPT Delaplane, Admiral Taylor asked why more salvage operations were not being undertaken. CAPT Delaplane's response was that there were no Navy salvage divers other than the two staff salvage officers [CAPT Delaplane and CDR Jim Cosper, USN (1140), Commanding Officer MDSU 2], only one Navy salvage ship (USS BEAUFORT), one commercial salvage tug (SMIT NEW YORK), and some ESSM equipment in-theater. There were approximately 50 Army divers assigned to the U.S. Army Dive Detachment (Provisional) with units based in Al Dammam and Al Jubail but they were not well suited for Navy salvage clearance work.

## **2. Initial Assessment of Salvage Planning and the way Salvage was Viewed by the Fleet.**

At first, those associated with salvage felt a sense of being "personas non grata." Somehow the salvage representatives had gotten off on the wrong foot with the Fleet. Establishing salvage credibility was clearly going to be an uphill climb. This *personas non grata*, coupled with the limited knowledge of salvage and awareness of its importance on the part of CTF 150/COMSEVENTHFLT staff caused much frustration among salvage officers in-theater, especially since Combat Support Squadrons (COMSUPRONS) Five and Eight in the past had been strong advocates of ship BDR, BDAT, and the concept behind flyaway SART for the past several years and had included salvage concepts in fleet exercises.

Fleet staff planners had an optimistic mind set that played out "what if" scenarios for various levels of success, and never considered the negative impact of something as realistic as a mine strike. This was professionally myopic.

CAPT Delaplane arranged for CDR Bert Marsh, Assistant Supervisor of Salvage and a salvage engineer, to return to Sharjah to monitor and supervise the arrival of the ESSM equipment and administer the SMIT contract. CDR Marsh also developed contingencies for the Program of Ship Salvage Engineering (POSSE), adding ship characteristics data to the basic POSSE program, especially for the amphibious ships since the planned amphibious operations could generate the greatest and highest-priority demand for salvage.

CAPT Shepherd eventually became the most effective and legitimized representative for salvage, since he was an experienced senior surface warfare officer with a Battle Damage Repair background. Initially, he preferred having CAPT Delaplane and CDR Marsh in Sharjah tending to salvage contingency planning while he managed maintenance and repair matters in Bahrain, including local vessel contracting. While CAPT Shepherd was having problems contracting local vessels and crews, CAPT Delaplane had contracted five vessels in Sharjah through the NAVSEA contract and was able to assist CAPT Shepherd.

## **3. The Amphibious Threat.**

As briefed by Admiral LaPlante, never before in the history of war had a more rigorous amphibious assault objective been planned. Likewise, never before had a more well planned or stronger beach assault defense been put in place than the Iraqi defense in the most probable assault areas in Kuwait.

The threat from the beach defense was compounded by the coalition's impotence in dealing with the shallow-water mine threat, in the surf zone out to a depth of 10-15 feet.

#### 4. Salvage Concept of Operations.

The salvage concept goal was evolving into a Gulf Squadron similar to COMSUPRONs Five and Eight, with a separate task group designator. As envisioned, this salvage organization involved commercial salvage tugs, platforms and equipment, Navy Mobile Diving and Salvage Unit (MDSU) teams and fly-away equipment, and shore-based ESSM gear in Sharjah, to be put on the commercial vessels and USS/USNS salvage and towing ships. The concept called for two Navy ships; USS BEAUFORT (ATS 2), a PACFLT ship and one LANTFLT ship. The plan was to leave the ARS, already deployed in the Mediterranean, there to support naval forces fighting the Gulf War from the Mediterranean and Red Sea. Initially planning called for 70 MDSU personnel to be deployed as teams and/or detachments on SMIT NEW YORK, SMIT MADURA, and any commercial shuttle tugs that would be required. The driving factor was the capability to integrate the "militarized" commercial vessels with Navy ships in combat and noncombat situations. Communications was a problem since the communication link between Navy ships and commercial tugs were VHF and INMARSAT.

The Concept of Operations (CONOPS) was developed around the requirements for handling any two full-scope salvage events simultaneously. The Operational Tasks (OPTASKS) included:

- Support of a beach amphibious assault north of the deep- water port of Ash-Shuaibah, Kuwait. The operation would require two Navy salvage ships to support the amphibious landing at the front working with the two Primary Control Officers who control boat traffic in the approach lanes. Navy salvage ships provide bow-lift for a sunken craft and clear the landing lanes. Civilian crews could not perform this function in spite of the SMIT can-do attitude and willingness to enter a mine field under escort or hazard themselves in a missile threat if required. The principal limiting factors were the bow-lift capability and surf zone work.
- Emergency triage of battle damage. SMIT NEW YORK and SMIT MADURA, with MDSU detachments (and integrated Salvage Assistance Response Teams [SARTs]) embarked, could best be utilized in the area farther offshore where combatants and large amphibious ships were stationed. These salvage tugs would respond to battle damage emergencies from shore gun fire or mine strikes with firefighting, dewatering, emergency BDR triage, and shuttle towing to the forward deployed tenders for battle damage repair.
- Port clearance operations in a port such as Ash-Shuaibah were critical to the logistics resupply of Marine Corps and Army ground forces. The available salvage clearance assets included:
  - Navy salvage ship.
  - SMIT TUG.
  - ESSM equipment.
  - Heavy-lift craft - only local asset was a McDermott 600 ton Ringer crane barge for 150K/day or an 1100 ton SMIT Sheerleg from Singapore for \$12,500/day (estimated total cost of \$700K for mobilization/demobilization and 45 days of clearance).
  - SUBTEC ONE, a yard salvage repair tender, to serve as a mother craft with berthing for 70, shops, 150- ton crane, salvage air system and an uncertified chamber.
  - BIG ORANGE VII, a salvage barge, for staging ESSM gear, a portable chamber, a light lift crane, etc.
  - SALVANNA and SALVALOR, two local tugs to be used for rigging, towing, etc.
  - IMSALV LION, a 8,000-SHP tug, considered a last resort asset due to the \$40K per day cost.

The decision on hiring a heavy lift craft was delayed until mid-February. It became apparent that Ash Shuaibah was not going to be a critical logistics throughput port. Consequently, the high cost of harbor clearance, even for humanitarian and economic reasons, could not be justified.

- Object recovery such as TLAMs and downed aircraft.

The decision not to launch an amphibious assault was made in early February, unknown to CTG 151.12 who continued to work on amphibious support/harbor clearance CONOPS as late as 24 February, the start of the ground war.

#### **5. The Need for BDAT and SART Response.**

The CONOPS identified the need for a Salvage Engineer with *POSSE* capability to provide the initial damage assessment and evaluate the ship's stability and structural integrity. Fortunately, CDR Marsh's planned departure from the Gulf was postponed and he had returned to Bahrain from Sharjah when USS TRIPOLI (LPH 2) hit a mine and USS PRINCETON (CG 59) suffered a mine strike shortly thereafter. Within a few hours, CDR Marsh and a 40-man Rescue and Assistance Team from USS JASON (AR 7) were put aboard USS TRIPOLI. CDR Marsh alone went on USS PRINCETON and did a superb job of assessing structural integrity, using *POSSE*. To provide proper offship firefighting and afloat battle damage assistance to Navy vessels involved in an amphibious operation, the proposed CONOPS included SART-team-capable 10-man MDSU detachments aboard the SMIT salvage tugs NEW YORK and MADURA and six-man teams on the smaller tugs.

#### **6. Contract Management.**

CAPT Shepherd had Contracting Officer's Technical Representative (COTR) authority and a COTR working for him at NRCC Bahrain. He was able to contract through NRCC for various requirements using USNAVCENT/CINCENT funding. CAPT Delaplane also contracted through NRCC for local services such as delivery of the Swedish remotely controlled mine sweeping vehicles that were not directly related to emergency salvage, thus saving NAVSEA funding for salvage specific requirements.

#### **7. Harbor Clearance Operations.**

The port of Ash Shuaibah was not badly damaged and was considered clear of major obstructions. A sunken missile boat still armed with missiles was not obstructing the port facilities. While considered a salvage project, the vessel was seen more as an EOD clearance project.

The harbor of Shuwaikh (note CDR Evans sketch), near Kuwait City was a harbor clearance project involving considerable salvage work. There were toppled pier cranes, an 800-ton offshore supply vessel rolled over on its side, small boats, two tugs, and a 25,000-ton grain processing vessel listing badly from a missile hit. This ship was the most pressing salvage project job since further listing would create a salvage project rivaling the NORMANDY project. After an extensive survey, Admiral Taylor was briefed on the salvage assets and time required and estimated cost:

Assets — Two MDSU Teams, USS BEAUFORT, BIG ORANGE VII, and a SMIT heavy-lift crane

Time — 30 days with startup in three weeks

Cost — \$1.8M

Admiral Taylor's response was not supportive, and he expressed concern over the lack of a Navy heavy lift capability and what seemed to be an excessive cost.

## **8. Problems, Missed Opportunities, and Future Opportunities.**

In July 1990, CINCENT held a major readiness exercise at McDill AFB, Fla., that involved a scenario of Iraq invading Kuwait, seizing the Ramali oil fields in northeast Kuwait. CONOPS were developed. COMSUPRON Five was invited to participate (for the first time ever) since PACFLT and COMSEVENTHFLT are major players. SUPRON Five sent an E-9 Master Diver as a representative whereas most players were O-5 or above. In retrospect, the salvage Navy missed the opportunity to weigh into the concept of operations. Had the COMSUPRONs participated in other joint operation exercises with experience in writing CONOPS and had the salvage CONOPS been written in July, salvage would have been legitimized as a Navy component player at the beginning of OPERATION DESERT SHIELD rather than late in the mobilization process when it was nearly too late.

The 1140 Special Operations Officer community has problems filling existing billets, let alone any new joint service billets that would enable participation in joint matters and war games.

We lost out by not getting NAVCENT staff representation for salvage in September and putting salvage into the OPLANS/OPTASKS with other Fleet elements. There would have been a much better chance of planning for the necessary assets; two Navy salvage ships, two commercial tugs, two additional contingency hires, a mobile support base, and MDSU teams at the support base and salvage ships with offship firefighting capability.

The Army's harbor clearance/port support mission was well covered in the U.S. Army Central Command's CONOPS. Assets were prepositioned on M/V AMERICAN CORMORANT, a float-on/float-off heavy lift ship. Additional craft, including diving craft and equipment, were delivered by planned sealift for marrying up with the Seventh Transportation Group operators. All was in place by the end of January and the Army was looking for work. The harbor clearance sequence of events in support of an amphibious assault begins with a Navy-Marine Corps beach landing, followed by securing the port and Navy harbor clearance to permit logistics through the port, after which the Navy turns the port over to the Army for further clearance and restoration for massive logistics support. Harbor clearance is a joint service evolution.

The Salvage component of the SPECOPS 1140 community has failed to achieve what the EOD component has succeeded in doing; marketing and writing EOD into OPLANS and CONOPS, developing an EOD Master Plan over a decade ago, and positioning and filling key billets at headquarters and on major staffs. The 1140-EOD leadership's only shortcoming was too much specialized within in EOD discipline.

In looking ahead, the Fleet Salvage Coordinator should be assigned to the senior staff, i.e., USNAVCENTCOM staff and be part of the task group that comprises the resources to execute the mission under the senior staff command. This may require a 3-4 man Special Operations "cell" with the requisite expertise for EOD, MCM and Diving & Salvage operations. The cell would include a salvage engineer and EOD/MCM/D&S officer(s). The task group members have the big picture and liaison with all the tactical force elements (CTFs) of the Battle Force. Both CTF 150 and CTF151 had EOD officers assigned to their staffs but they dealt with EOD matters only. Some flexibility and tailoring would be necessary to best fit the organizational structure to the threat and tactical objectives. If a Force Salvage Coordinator had been on Admiral Arthur's staff, he would have flown over to CTF 156 embarked on USS NASSAU and spent several days working on the salvage support for an amphibious assault operation. With a draft of the CTF 156 CONOPS, the requirements can be presented to the senior staff and then tasking orders written for the "Gulf COMSUPRON", CTG 150.12 to detach and report to CTF 156 for the period of the amphibious assault. The Force Salvage Coordinator is cognizant of all planned and unplanned salvage support requirements and can prioritize customer needs.

At the 1140 Steering Committee meeting held at NWS Yorktown in April 1991, the group came up with a revised 1140 Career Plan that perhaps for the first time produces officers who are cross-trained in Diving & Salvage and EOD and go on to develop special expertise in EOD and MCM, D&S and MCM, or EOD and D&S. The expanded MDSU concept will be the core element of the future diving and salvage component if salvage ships are all turned over to Military Sealift Command and will become more integrated into an 1140 organizational structure along the lines of the current EOD organizational structure.

## Interview Report

Interviewee: Mr. Jerry Totten  
Mr. Mark Katsolis  
Mr. Ray Perez  
Mr. Don Cook  
Mr. Bill Hayes

ESSM Base  
c/o GPC  
Box JK  
Williamsburg, VA 23187

Interviewer: John Allen  
Jamestown Marine Services, Inc.

Michael Mulcahy  
Jamestown Marine Services, Inc.

Date: 29 April 1991      Duration: 1 hour 30 min.  
15 May 1991          Duration: 1 hour 30 min.

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### 1. Background.

During the course of this interview, Messrs. Totten, Katsolis, Perez, Cook and Hill provided thoughtful insight into the planning, transportation, warehousing and deployment of Emergency Ship Salvage Material (ESSM) equipment required in the Gulf War, as viewed from the logistics support perspective of the ESSM prime contractor. Based on their experience and personal involvement in the events occurring in the Arabian Gulf, they offered an interesting perception of OPERATION DESERT SHIELD and DESERT STORM salvage equipment problems and opportunities. The following writeup captures the highlights of the interview.

### 2. CONUS Mobilization.

On 29 November 1990, SUPSALV made preliminary inquiries of its ESSM contractor, GPC, regarding the level of salvage effort GPC could support in the Arabian Gulf, and forwarded a suggested list of equipment. Over the next six weeks, that list grew significantly. The early coordination between SUPSALV and GPC facilitated the task of projecting associated weights and dimensions of shipping configurations—and thus aircraft weight. GPC's experience the previous year in shipping oil spill equipment to the EXXON VALDEZ cleanup in Alaska was a further aid to projection of equipment shipping footprints.

The majority of ESSM equipment sent to the Arabian Gulf in January 1991 was staged and ready for shipment before Christmas 1990. Because DESERT SHIELD/DESERT STORM was a tactical operation, GPC was permitted to ship tanks containing fuel; had it not been a tactical situation, the tanks would have had to be empty, according to regulations governing MAC transport.

SUPSALV designated Williamsburg as the primary source of ESSM equipment for the Arabian Gulf, with no augmentation from the ESSM base in Leghorn, Italy. This decision was based on the need to maintain a rapid-deployment capability in Italy in case Iraqi forces attempted to block the Suez, an early Allied concern.

Except for three welding kits from the Stockton, Cal., base, all ESSM gear in the Arabian Gulf came from Williamsburg. The 325 tons of salvage equipment sent constituted only 25% of the Williamsburg stock.

ESSM DESERT STORM equipment filled 23 trucks and 16 C-141 aircraft. It was loaded in Williamsburg in slightly over 24 hours (11-12 January) and trucked to Norfolk Naval Air Station, where airlift to Sharjah, U.A.E., commenced 11 January. Because of higher-priority aircraft demands, the USAF interrupted the airlift for several days after the first five flights. During the delay, ESSM equipment was temporarily stored at an NAS Norfolk holding area until aircraft became available. The airlift was completed over a period of eight days, with the last planeload delayed until 18 January. In both Williamsburg and Norfolk, GPC and USN personnel worked around the clock until the aircraft were loaded. Mr. Bill Hayes, ESSM Warehouse Manager, specified equipment placed aboard each aircraft.

### **3. TPFDD.**

SUPSALV's ESSM equipment has now been placed on the Time-Phased Force and Deployment Data (TPFDD), the inter-service mechanism for rapid long-distance mobilization of personnel and equipment. The extra day or two that it took to accomplish placement on TPFDD should facilitate mobilization the next time a massive ESSM airlift is required. Inclusion in TPFDD, in combination with an OPLAN calling out specifics of equipment shipment, should streamline wartime logistics.

### **4. ESSM Sharjah Warehouse.**

From 15-27 January, GPC Sharjah personnel checked equipment into the ESSM warehouse, staged it in system configurations, and set up PMS procedures. PMS was conducted from late January until April, when the equipment was either demobilized or transferred to Bahrain. CAPT. Steve Delaplane and CDR Bert Marsh had authority to issue ESSM equipment.

### **5. Sharjah ESSM Loadout.**

On 18 February, precipitated by the USS PRINCETON and USS TRIPOLI mine hits, the SUPSALV chartered salvage vessel BIG ORANGE VII was loaded out in Sharjah with over 100 tons of ship salvage and firefighting gear. ESSM pumps were placed aboard the SMIT NEW YORK for damage control use. GPC personnel loaded both vessels within three hours.

The SMIT International/Brown & Root joint venture, Rockwater International, acted as a GPC agent and was highly efficient in processing requests for handling equipment.

A GPC warehouseman and a mechanic conducted PMS and loaded all ESSM equipment in accordance with NAVSEA direction. This included hardware returning to CONUS, which was loaded into SEA LAND containers in Sharjah.

### **6. Bahrain Warehouse.**

In early April GPC, acting on behalf of NAVSEA under the ESSM contract, signed a 12-month lease on commercial warehouse space in Bahrain. GPC Sharjah personnel oversaw the shipment of 114 tons (approximately one-third of the amount sent to Sharjah) aboard the M/V GALA. CAPT Delaplane and Mr. Jerry Totten selected equipment that remained in Bahrain. The Bahrain base was established as a means of sustaining long-term SUPSALV salvage presence in the Arabian Gulf region.

## **7. Demobilization.**

Equipment transported by SEA LAND container service left Sharjah on 11 April and arrived at the ESSM facility in Williamsburg in July 1991. GPC personnel refurbished it and returned it to a ready-for-issue status.

## **8. Problems Encountered.**

At NAS Norfolk, a handling problem occurred because personnel had increased at a far greater rate than handling equipment; thus, handling equipment sometimes was scarce. In addition, since aircraft loading manpower included reserve personnel, unfamiliarity with base procedures degraded loading efficiency.

Although customs could be cleared fairly quickly, securing admission of trucks to the Mirage air base in Sharjah was a significant problem. Several police jurisdictions—including Sharjah, U.A.E. and U.S. military—overlapped at the Mirage facility, so it sometimes took three hours to clear a truck to enter.

Some personnel felt that Capt. Shepherd, OIC, SRUDET BAHRAIN, acknowledged authorization for ESSM equipment issuance only if it had originated IN THEATER, not in Washington. Until this was clarified, GPC personnel received some conflicting signals. The situation was rectified when LCDR Balk assumed SUPSALV liaison role in ordering ESSM equipment movement in-theater.

RADM R.A.C. Taylor, Commander Middle East Forces (CMEF), received salvage input from financial and logistics specialists, vice experienced salvage officers.

## **9. Lessons Learned.**

The Rockwater facility in Sharjah was workable for storing and deploying ESSM gear, as well as providing office space, but in terms of response time it might have been preferable to locate the ESSM facility 150 miles closer to the action in the North. It was logical to co-locate tugboat coordination with the ESSM gear, whose primary function was to support salvage tug operations.

Although logistics support in Sharjah may have been superior to what would have been available in Bahrain, the tradeoff was that Sharjah was remote from the center of operational decision-making. Mr. Totten, based in Sharjah, had contact with central command staff only through CAPT Delaplane in Bahrain.

If the Mobile Diving and Salvage Units (MDSUs) had come to Sharjah as planned, there would have been an equipment shortfall aboard the SUBTEC I barge, due to the transfer of ESSM equipment to the BIG ORANGE VII.

## **10. Recommended Changes.**

ESSM equipment deployment plans should be keyed to specific operational scenarios, building on the NAVSEA Inventory Objectives instituted to support reserve MDSU units. Specialty areas include beach clearance, harbor clearance, and towing/salvage/firefighting. Deployment plans should specify equipment by system, including recommended loadout configuration.

## **Interview Report**

**Interviewee:** Mr. Roger Elliott  
Deputy Managing Director  
SMIT TAK Towage & Salvage (S) Pte. Ltd.  
15 West Coast Highway, # 04-08  
Pasir Panjang Building  
Singapore 0511

**Interviewer:** Bruce Banks  
Jamestown Marine Services, Inc.

Michael Mulcahy  
Jamestown Marine Services, Inc.

**Date:** 9-10 May 1991 **Duration:** 10.5 Hrs.

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### **1. Background.**

During the course of this interview, Mr. Elliott provided thoughtful insight into the salvage planning and interaction of salvage events of the Gulf War, as viewed from the supporting role of the Supervisor of Diving and Salvage's Western Pacific Zone salvage contractor. As the senior SMIT representative assigned to set up a remote salvage support base, Mr. Elliott had full autonomy within his company. Based on his knowledge of salvage, long experience as a professional salvor and worldwide salvage manager, and his early presence in the Arabian Gulf, Mr. Elliott offered an interesting perception of OPERATION DESERT SHIELD AND DESERT STORM salvage problems and opportunities. The following writeup captures the highlights of the interview.

### **2. Combat Salvage Organization.**

The U.S. Navy chain of command worked well in Sharjah. CAPT Delaplane was the equivalent to the Force Salvage Commander (FSC), and could move commercial assets as he saw fit.

CAPT Shepherd, CAPT Delaplane's superior and Officer-in-Charge (OIC) of the Ship Repair Unit Detachment (SRUDET) Bahrain, did not need Contracting Officer's Technical Representative (COTR) authority. Authority to control funding for operations must reside within the command structure most involved in those operations; in this case, CAPT Delaplane, CDR Marsh and LT Balk responded to budgetary requirements, and had the knowledge of operations to make informed budget decisions.

If Salvage Assistance Response Teams (SARTs) had existed, for Desert Storm purposes, an effective deployment strategy would have been to position one team each on SMIT NEW YORK (SNY) and SMIT MADURA (SM), and the remainder on the SUBTEC 1 barge.

CAPT Delaplane should have been on the NAVCENT staff, next to the Battle Force Commander (BFC), where he could make judgments regarding the effect of a casualty on a U.S. Navy vessel's warfighting capability, and advise the BFC accordingly.

The Force Salvage Engineer (FSE) should report to the FSC (salvage operations), who in turn reports to the BFC. The FSC makes recommendations to the BFC regarding which damaged ships can and should be saved—and, by extension, which ships might have to be stripped (time permitting), abandoned, and allowed to sink.

Some aspects of USN/commercial salvage are comparable. On the commercial side, the chain of command goes from the junior salvage master through the salvage master to management. Management does not become directly involved with salvage. In the SUPSALV organization, by contrast, managers sometimes act as salvage masters. Best management practice suggests that all members of the salvage organization act in the areas of their greatest strength.

Once SART teams become a reality, to provide the best worldwide emergency salvage coverage, station and rotate:

- 2 SART teams drawn from a Naples Mobile Diving and Salvage Units (MDSUs).
- SARTs in:
  - Pearl Harbor.
  - Subic Bay.

Rationale: ESSM gear is distributed worldwide; wherever ESSM gear is located there should also be salvage personnel and command structure. The ESSM gear currently stored in Livorno, Italy, should be shifted to Naples, where SART teams are stationed and the FSC is on the SIXTHFLT staff. The FSC can operate best when both personnel and equipment under his cognizance are near him.

Both SNY and SM have a broad range of capabilities, but both would require augmentation by organic USN salvage forces in a major Navy ship disaster. The reason is that SMIT crews do not know the detailed arrangement of USN ships. SNY and SM capabilities include towing, FF, lifting and diving support. The presence of ESSM gear on BIG ORANGE VII supplemented inherent capabilities of the SMIT tugs during OPERATION DESERT STORM.

### **3. Rationale for Selecting Sharjah for Vessel Operations Base.**

Sharjah was the ideal base for both contractor operations and ESSM gear. It offered:

- General ease of supply and operations.
- Proximity to an immense industrial logistic support base and well-established infrastructure.
- Remoteness from the central military bureaucracy in Bahrain.
- Ease of communications.
- The largest shipyards and ports in the Gulf.
- Vendors of all required salvage consumables.
- A ready labor supply.

#### **4. Amphibious Assault Requirements.**

If the planned amphibious assault had materialized, organic USN/contractor in-theater assets would have been woefully inadequate in the areas of vessel towing, retraction, firefighting, harbor clearance, and over-the-shore support for a Marine brigade. The ideal salvage force for dealing with projected casualties under an amphibious assault scenario would have been:

- 2 U.S. Navy within the amphibious lanes.
- 4-5 commercial tugs stationed outside the assault lanes, receiving casualties from USN salvage ships for further tow to a repair activity outside the theater.
- 70 MDSU personnel with officers.

The shortage of trained USN salvage personnel in-theater would have been more devastating than the absence of the second U.S. Navy salvage ship, since the MDSU detachments that would be deployed on the commercial salvage tugs would be critical to USN/commercial interoperability and effectiveness.

#### **5. Port Rehabilitation.**

There was no dialogue between the Navy and U.S. Army regarding harbor clearance/port rehabilitation until after the war ended. This important issue should have been addressed well before the war started and included in Battle Plans and OPORDERS.

A port clearance operation has two major aspects:

- Harbor clearance, approach and pier access—a USN function.
- Facilities (operations, trucks, roads, cranes)—an Army function.

#### **6. Harbor Clearance.**

A 1,000-ton sheerleg crane, operating with the work barge SUBTEC 1, would have been sufficient to clear the harbor at Ash-Shuaibah. If hostilities had been protracted and it were needed in-theater, the crane would have cost approximately \$1 million, which would cover round-trip towage from Singapore.

In addition to harbor clearance, the crane could lift objects such as:

- Sunken patrol boats.
- Downed planes.
- Ordnance (missiles).

The fact that such an asset was missing from Operation Desert Shield/Desert Storm was a serious oversight, because organic USN assets are sufficient to cover only about one-half of harbor clearance requirements. Without contractor augmentation, the USN harbor clearance mission is untenable.

A cost-effective, long-term solution to the shortage of organic USN harbor clearance platforms would be a Government-Owned/Contractor Operated (GOCO) vessel that could produce revenues in peacetime, but would revert to government use in war. This is an optimum arrangement for both the government and the contractor. It ensures that the government's best contractors stay under contract and are available when needed. This protects the government's investment, puts existing vessels to best use, and avoids wasteful resource duplication.

## **7. Training.**

The importance of training cannot be overemphasized. SMIT conducted frequent firefighting (FF) and towing exercises, often executed at night. Underway exercises (e.g., towing, firefighting) were held every other day. These evolutions would have been good opportunities to practice working with USN MDSU teams if the teams had been allowed in-theater. Fire, abandon-ship and lifeboat drills were held daily.

Towing exercises involved only the vessels SNY and SM, because there were no uncommitted large transport vessels. The value of such intense training became apparent when a real casualty occurred. When responding to the PRINCETON casualty, SMIT crew members made PRINCETON fast to SNY in only 10 minutes.

SNY is an ideal training platform for U.S. Navy salvage engineers, operators, and current and future salvage ship skippers.

SNY could also be utilized as a diving platform, with Navy divers using a Navy-certified Flyaway Diving System (FADS).

In the future, flyaway SART and MDSU teams will have to work from platforms of opportunity. Therefore, when the first SART team becomes a reality, it would be useful to train the team aboard a SMIT asset in joint operations with commercial salvors. This would provide an opportunity to evaluate reactions on both sides.

## **8. SMIT Equipment/Personnel Capabilities.**

SMIT International's vast reserves of equipment and personnel were available for SUPSALV to draw on if required for Operation Desert Shield/Desert Storm. These resources included:

- Heavy lift capacity—14,000 tons straight from the seabed (e.g., a small bulk carrier or medium-size cargo vessel).
- SMIT personnel—approximately 2,850 men.
- 284 units worldwide, including:
  - Tugs (400-22,000 HP).
  - Barges (100-24,000 tons).
  - ♥ Anchor-handling/Tug/Supply (AHTS) Vessels (4,000-12,000 HP).

SMIT contingency assets for port clearance/wreck removal included cranes with 1,000- and 2,500-ton lift capacity. The assets were available, but located 3-4 weeks' transit away from the DESERT STORM theater. A viable contingency plan would have provided for prepositioning these assets where they would be readily available to serve in-theater requirements.

## 9. Military Sealift Command.

The Military Sealift Command (MSC) was a glaring organizational anomaly in DESERT STORM operations. Its mission was logistical support, but its fleet operated autonomously. MSC handled all its own chartering and movements, without contacting the FSC or operational commander (NAVCENT).

Because of the lack of communications among NAVCENT, the FSC and MSC, in-theater salvage assets were effectively for the benefit of combatants only. There was no exchange of information regarding respective salvage resources in the USN and MSC. This was poor use of resources.

Maritime Prepositioned Ships (MPS) and RO/RO Ready Reserve Fleet ships, loaded for amphibious assault support, should be considered by the Battle Force Commander (BFC) as high-value combatants for salvage purposes. Even though MSC retains operational control over these assets for crewing, chartering, etc., they may need salvage services just like a USN combatant.

Every time a shamal (local tornado) developed in the Gulf, mines sown in the northern Gulf broke loose and traveled south, becoming a mobile mine threat. This is why TRIPOLI and PRINCETON got hit. MSC vessels, operating with no communications with NAVCENT, steamed through these "mobile" minefields. If any more MSC vessels had taken hits, there would have been no coordinated plan for rendering salvage assistance, with no formal MSC/USN reporting channels established. SOLUTION: an MSC representative must be assigned to NAVCENT staff to apprise BFC of MSC vessel movements and requirements for assistance.

In the second week of January, the MSC vessel CAPE CHARLES requested assistance, as she had suffered an engineering casualty and was dead in the water. Due to lack of liaison between SRUDET Bahrain and MSC, SNY and a USN combatant were dispatched to render assistance to the CAPE CHARLES when it no longer required help, but had failed to notify SRUDET Bahrain (CAPT Shepherd) of its change of status. As a result, the two vessels converged on the CC's last known posit, could not locate it, and learned later that CC had departed the area under its own power. SNY had interrupted her escort of stricken MSC oiler HIGGINS (T-AO 190) from Masirah to Dubai in order to respond to CAPE CHARLES' request for assistance.

The CAPE CHARLES incident revealed a significant lack of communication and coordination of USN salvage resources. A subsequent discussion between Mr. Elliott and CAPT Shepherd resulted in establishment of the procedure for fielding MSC requests for assistance, directing such requests to CAPT Delaplane, the FSC.

## 10. Commercial Logistics.

In wartime, a contractor has the same re-supply requirements as the USN, and must be supplied through USN supply system. The problem at the outset of hostilities was that no commercial flights went into Dubai, Bahrain, Sharjah or Riyadh, and no shipping came into the Gulf.

"Beans, bullets and black oil" requirements for contractors continue in wartime although conventional supply channels may be closed off. Contractor logistical requirements (transportation, resupply, maintenance, etc.) must be provided for in the Transportation Priority Force Deployment Data (TPFDD).

SMIT and National Foam, The Netherlands, have an agreement under which SMIT can draw on worldwide stocks of that supplier's foam and pay only for foam used. National fulfilled all SMIT foam requirements during OPERATION DESERT SHIELD/DESERT STORM. SMIT controlled 25 tons of 3% foam, while actually using only about four 55-gallon drums—in firefighting exercises.

## **11. Communications.**

The following communications connected Sharjah, Bahrain (SRUDET), and the vessels SNY and SM:

- SSB.
- VHF.
- SATCOM.
- Telex over Radio.

A 24-hour radio watch was maintained at Sharjah Base whenever SMIT ships were operating. It was manned by a SMIT professional radio officer, experienced in salvage operations and communications.

SNY and SM had open-circuit communications. The question often arises whether the USN should build into contractor assets a secure voice circuit. All USN vessels should have in their radio rooms the capability to switch between military and commercial frequencies. Commercial craft are forbidden by law from modifying their circuits to operate on military frequencies, but the USN should be able to use both.

Because communications with commercial craft are nonsecure, those craft should carry a liaison officer, and have a portable "black box" to interface between the two nets to permit a secure commercial/military net, under supervision of the military liaison officer on board the commercial craft. The USN must be capable of modifying communications on platforms of opportunity to render them secure.

Liaisons w/ commercial craft should be drawn from the ranks of U.S. Navy (salvage) master chiefs and junior officers.

## **12. ESSM Equipment.**

ESSM equipment was loaded aboard BIG ORANGE VII for mobility. The 3" pumps that were used for dewatering operations performed very well.

Some of the beach gear could have been left behind, assuming that the major salvage demands of DESERT STORM would be towing and FF (requiring pumps, generators, compressors).

Assets should be mobile, capable of being deployed with salvage equipment aboard. A platform of opportunity, such as the BIG ORANGE VII, loaded with ESSM equipment, significantly increases the area of the equipment's effectiveness.

## **13. Lessons Learned.**

Commercial salvage assets should have been prepositioned in-theater, vice 3-4 weeks away (in Singapore) for the most viable salvage contingency plan to have been in place.

Luck played an extremely important role in Operation Desert Shield/Desert Storm. It was fortunate that:

- The planned amphibious assault never occurred. It would have required Joint Logistics Over The Shore (JLOTS), for resupply and attendant probable vessel casualties.

- The Iraqis did not:
  - Blow up tankers to seal off every Kuwaiti port.
  - Sink more ships in harbors.
  - Blow up oil terminals.

Diverse elements of the USN combat force were not set up such that any single person had the "big picture." This situation underscores the crying need for Force Salvage Coordinator representation on the NAVCENT staff. Although USN technical salvage ability was in-theater, it was fragmented and not organizationally addressed.

If the planned amphibious assault had materialized, organic USN/contractor in-theater assets would have been woefully inadequate in the areas of vessel towing; retraction; FF; harbor clearance; and over-the-beach support for a Marine brigade. The ideal salvage force for dealing with projected casualties under an amphibious assault scenario would have been:

- 2 U.S. Navy salvage ships.
- 4-5 commercial tugs.
- 70 MDSU personnel with officers.

The shortage of trained USN salvage personnel in-theater would have been more devastating than the absence of the second gray hull vessel.

There was no dialogue between the Navy and U.S. Army regarding harbor clearance/port rehabilitation until after the war ended. This important issue should have been addressed well before the war started and included in Battle Plans and OPORDERS.

SMIT contingency assets for port clearance/wreck removal included cranes with 1000- and 2500-ton lift capacity. The assets were available, but located 3-4 weeks' transit away from the DESERT STORM theater. A viable contingency plan would have provided for repositioning these assets in-theater.

Because of the lack of communications among NAVCENT, the FSC and MSC, in-theater salvage assets were effectively for the benefit of combatants only. There was no exchange of information regarding respective salvage resources in the USN and MSC. This was poor use of resources.

Maritime Prepositioned Ships (MPS) and RO/RO Ready Reserve Fleet ships, loaded for amphibious assault support, should be considered by the Battle Force Commander (BFC) as high-value combatants for salvage purposes. Even though MSC retains operational control over these assets for crewing, chartering, etc., they may need salvage services just like a USN combatant.

"Beans, bullets and black oil" requirements for contractors continue in wartime although conventional supply channels may be closed off. Contractor logistical requirements (transportation, resupply, maintenance, etc.) must be provided for in the Transportation Priority Force Deployment Data (TPFDD).

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Assets should be mobile, capable of being deployed with salvage equipment aboard. A platform of opportunity, such as the BIG ORANGE VII, loaded with ESSM equipment, significantly increases the area of the equipment's effectiveness.

#### **14. Recommendations.**

The USN combat salvage command structure should be vertically integrated, culminating with a senior salvage officer on the staff of the top operational command—with budgetary authority for all required in-theater salvage commitments.

USN officers making decisions affecting operational assets should be either current or former operators themselves. The three major functional management areas common to both commercial and military salvage organizations are:

- Operations.
- Financial.
- Technical.

The latter two are support functions for the most important functional area—operations.

SUPSALV should create and maintain a Navy-wide data base covering all SUPSALV salvage jobs—no exceptions.

With SMIT's help, SUPSALV should determine an appropriate combination of foam stocked organically in the ESSM system, supplemented on demand by a supplier such as National Foam. Because of the expense of maintaining a large foam inventory, it is recommended that SUPSALV direct the vendor to maintain the inventory.

## Interview Report

Interviewee: CDR Jim Evans, USN (1140)  
Commanding Officer  
Mobile Diving and Salvage Unit One  
Pearl Harbor, HI 96800-7005

Interviewer: John Allen  
Jamestown Marine Services, Inc.

Michael Mulcahy  
Jamestown Marine Services, Inc.

Date: 7 May 1991    Duration: 2 Hours

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### 1. Background.

During the course of this interview, CDR Evans provided thoughtful insight into the salvage demands and events of the Gulf War from his first-hand experience in preparing Mobile Diving & Salvage Unit (MDSU) ONE for mobilization and deployment to the Arabian Gulf and his personal in-theater involvement while serving as Salvage Officer on CTG 151.12 staff. Based on his experiences and his long professional involvement with and knowledge of operational salvage and diving, he offered an interesting perception of OPERATION DESERT SHIELD and DESERT STORM salvage problems and opportunities. The following writeup captures the highlights of the interview.

As Commanding Officer of MDSU-1, CDR Evans' earliest involvement with OPERATION DESERT SHIELD began in August 1990, with an EOD requirement for a recompression chamber in the Middle East. A Fly-Away Diving System (FADS) II and six-man team were put on standby. This was MDSU ONE's first encounter with the Transportation Priority Force Deployment Data (TPFDD) system. After three weeks of waiting for air transportation, a dedicated aircraft was assigned and the FADS team arrived in Bahrain on 2 September 1991.

At the same time, MDSU-1, COMSUPPRON FIVE, and the CINCPACFLT salvage officers raised the issue of getting salvage ships into the Gulf as well as deploying a MDSU detachment in Bahrain for rapid salvage response if hostilities developed. Some senior officers regarded salvage ships as too slow, poorly defended and therefore, more of a liability than an asset. COMUSNAVCENT never responded to the concept of deploying a MDSU detachment.

In late November the salvage ship deployment issue was resolved. USS BEAUFORT (ATS 2) would deploy to the Arabian Gulf from WESTPAC, with USS SALVOR (ARS 52) deploying from MIDPAC to WESTPAC in January 1991. Also in January, MDSU-1 put 50 personnel on standby in response to a draft Concept of Operations (CONOPS) provided by CAPT Steve Delaplane, USN (1140) and supported by OP-03. The intent was to place 10-man teams capable of offship firefighting and limited diving on the two SMIT salvage tugs and six-man offship firefighting teams on three smaller tugs. COMNAVLOGSUPFOR (CTF 153) supported the MDSU detachment, but COMUSNAVCENT (CTF 150) disapproved of bringing any more assets into the Gulf theater.

In December, MDSU ONE made plans to send a 50-man detachment, representing half of the MDSU organization headed by CDR Evans. When it became clear that the MDSU Detachment would not deploy, the decision was made to send CDR Evans to assist and eventually relieve CAPT Delaplane as the senior 1140 salvage officer at CTG 151.12. The CTG 151.12 organization, under the command of CAPT Pat Shepherd, USN (1110) consisted of four divisions: Mine Warfare Maintenance, Combat Systems Maintenance, Dubai Shipyard Detachment, and the Salvage Detachment.

CDR Evans' itinerary included the following:

- 13 March Arrived under CMEF funded orders for assignment to CTG 151.12.
- 15 March Accompanied CAPT Delaplane to Kuwait with the mission of moving two supertankers clear of north Al Ahmadi pier. While waiting for written authorization from the Kuwaiti government to move the ships, Navy Salvage Officers teamed up with the Army divers to form an effective harbor clearance unit.

#### NOTE

By this time, COMIDEASTFOR (CTF 151) staff had established liaison with the American Embassy for dealing with the Kuwaiti government.

- 15 March Designated as OTC for moving two tankers at the Al Ahmadi pier (CTG 151.12 LDI 91-002). Rigged towing bridles using equipment from M/V SMIT NEW YORK and SMIT MADURA and moved the empty tankers to the designated, mine-swept anchorages the following morning.
- 21 March Received "Hold Harmless Agreement" and letter designating anchorage locations for moving Iraqi supertankers "hitten" and "Al Qadisiyah". Verified completion of final mine sweeping operations (SAMS) in vicinity of north Al Ahmadi pier.
- 22 March Moved "hitten" to anchorage (29-11.5 or 48-26.2E). Returned to north Al Ahmadi. Prepared "Al Qadisiyah" for tow.
- 23 March Towed Supertanker "Al Qadisiyah" to anchorage. (29-10.6N 48-20.4E) returned to Mina Ash Shuaibah. A previously discovered sunken OSA-II boat with two Styx missiles on board that the Kuwait government wanted salvaged was relocated. This was a combined EOD and wreck removal salvage project. Rendezvous with U.S. Army dive team for OSA II salvage planning.
- 24 March EOD safed warheads and rocket motors for both Styx missiles. Salvage decision made to cut the two remaining launchers off using underwater cutting techniques - BROCO Rod (oxy-arc).
- 25 March Diver debris clearance topside of OSA II. Preparations for starting underwater cutting.
- 26 March Port recovery meeting Plaza Hotel, Kuwait City. U.S. Army (Corps of Eng.) MAJ Jenkins, Capt. Nichols, Mr. Gary Gamel; Govt. of Kuwait Capt. Naibari; U.S. Navy CAPT Pat Shephard, CDR Jim Evans, LCDR Bill Cook. Detailed salvage work to be done in Mina Ash Shuwaybah by USA/USN - refloat OSA II, remove Styx missile(s). Proposed that govt. of Kuwait choose option for salvage of Mina Ash Shuwaikh. 1) Commercial contracts; 2) Navy with commercial lease assets - MDSU-1/2 do work, gov't contract heavy-lift crane/support vessel; 3) USS BEAUFORT cut everything into < 20-ton pieces and lift with her crane. Capt. Naibari stated they wished to have a Kuwaiti company do the work.

26 March Commenced underwater cutting on postforward (number 2) launches. Sailed SMIT TAK Madura to Sharjat, U.A.E. to be taken off-hire.

27 March Continued underwater cutting on number two launcher. While cutting through an electrical umbilical (3rd attempt), the solid fuel booster rocket motor ignited and launched the Styx missile through the muzzle door for an underwater distance of about 20 feet. There were no injuries. The hypergolic chemicals from the liquid fueled rocket motor leaked into the harbor. The area around the sunken OSA had very high acid level and the berth was flushed using the Army diveboat screws.

EOD team surveyed the missile launcher and damaged missile and determined the missile was safe to remove from the water.

28 March EOD team removed the remainder of the number two Styx missile from the water and transported to Army EOD for disposal.

Commenced rigging to attempt to lift the boat onto the quaywall using a 100-ton, ring-mounted, floating crane (U.S. Army crane barge ALGIER) and a 140-ton, mobile pier crane.

29 March Continued rigging. Stern sling was 3 1/2" chain, bow sling was four legs of 1 1/2" stud link chain.

30 March Raised OSA II to surface using floating and pier cranes. Dewatering boat using two ESSM Pool 3" salvage pumps and a small "trash" pump. While attempting to lift the bow clear of the water, one leg of the bow sling parted. The boat was allowed to settle on the bottom using the stern sling to control the sink rate.

31 March Re-rigged bow sling using 3 1/2" chain. Raised OSA II to surface again. Patched ruptured overboard discharge and a few relatively minor leaks were patched with DC plugs. Pump hulk out using two ESSM Pool 3" salvage pumps, 2 U.S. Army 4" salvage pumps, and the "trash pump".

01 April EOD TECHs cut remaining launcher free using oxy-acetylene cutting torch. Entire launches with intact Styx missile transported to U.S. Army EOD for disposal.

02 April Conducted surface survey update of Mina Ash Shuwaikh. Sailed SMIT NEW YORK to Sharjah, U.A.E. to be taken off-hire. Returned to Bahrain.

Took the SMIT NEW YORK and SUBTEC ONE off-hire and decided to move the portion of the ESSM equipment from Sharjah to Bahrain that would remain in-theater.

06 April Received approval to move ESSM pool from Sharjah, U.A.E. to Bahrain.

09 April Travel to Mina Ash Shuwaikh, Kuwait for underwater inspection of sunken OSA I.

10 April Conducted underwater survey of OSA I with EOD personnel. VADM Arthur, RADM Taylor, RADM Laroper visited EOD camp. VADM Arthur/RADM Taylor stated we would not do any salvage in Ash Shuwaikh.

11 April Returned to Manoma, Bahrain.

14 April ESSM pool equipment arrive Bahrain. Warehoused at Sitrah, Bahrain.

- 16 April      Call on RADM Taylor, USN. (COMIDEASTFOR) Discussed: 1)OPCON for BEAUFORT upon disestablishment of CTG 151.12 (Salvage commander). 2)Aircraft recovery jobs progress update - wrap up of AC-130 crash near Khafji and RF-4C crash off Southern tip of Bahrain. 3) Condition of OSA I sunk in Mina Ash Shuwaikh. and 4) Relocation of ESSM pool equipment from Sharjah, U.A.E. to Bahrain. Tasked to wrap up commercial contracts and report status to him.
- 27 April      Call on RADM Taylor, USN (now COMUSNAVCENT). Made final contracts closeout report to him.
- 03 May        Departed Manama, State of Bahrain.

## 2. The Salvage Situation.

CAPT Delaplane had been in the Gulf for two months when CDR Evans arrived in mid-March to relieve him. CAPT Delaplane, an experienced fleet salvage officer, went to the Gulf, under OP-03 endorsement, to satisfy COMUSNAVCENT's request for an O-6 salvage officer. His agenda was focused on a concept of operations comprised of Navy fleet salvage ships and MDSUs, augmented by commercial salvage tugs. Concurrently, NAVSEA 00C sent CDR Bert Marsh, USN (1440), a salvage engineer, as the NAVSEA representative to the Arabian Gulf. CDR Marsh's focus included ESSM equipment, SMIT salvage and offship firefighting assets, and the application of the Program of Ship Salvage Engineering (*POSSE*) to assess the structural integrity of damaged ships. LCDR Dave Balk had a ship husbandry agenda that was difficult to sell in view of the comparatively inexpensive drydocking costs in area shipyards. The tenders were taking care of many small jobs.

By March, it was clear that COMUSNAVCENT, VADM Stanley Arthur's staff,, wanted the salvage assets fully under the Fleet Commander's control, did not want any more salvage ships or a MDSU deployed to the Gulf, and rejected the "Washington" push for more. The Navy Flag Officers, including COMIDEASTFOR/CTF 151, RADM Taylor, were embarrassed by the fact that salvage was the only fleet requirement needing up-front sponsored funding for contract salvage services.

Admiral Taylor was an advocate for the MCM, EOD and Salvage elements of the 1140 community. He wanted to do salvage, having taken over COMIDEASTFOR/CTF 151 just as the warfighting was ending. His expressed observations were:

The mine warfare personnel performed well; the one mine countermeasure and three minesweeper ships did not perform as well.

In general, EOD performed very well, with the single exception of not following or meeting planned schedules.

Salvage had difficulties in presenting a solid front supported by salvage operators and the salvage engineers. There was frustration in trying to sort out who had the capability and responsibility for various salvage tasks - 1140 salvage officers, 1140 EOD officers or 1440 salvage engineers.

These observations tend to reinforce the Fleet's perceived disunity within the 1140 community and an ill-defined special operations mission. Salvage is inadequately represented on major Fleet staffs. These shortcomings were discussed 10 years ago in 1140 Steering Committee meetings.

Few in the Fleet understood the Navy salvage ship requirements for the retractions, emergency battle damage assistance, clearance, and towing associated with an amphibious landing. Had the planned amphibious assault occurred, a single salvage ship would have been insufficient. As early as September and October, efforts to get salvage assets into the Gulf Theater encountered a USNAVCENT staff attitude that the salvage ships were too slow to be effective, and they could not take care of themselves. It was not until late November or early

December that COMSIXTHFLT staff expressed concern for the lack of salvage assets in the Gulf region, and recommended that ESSM and at least one salvage ship be deployed to the theater.

### **3. Harbor Clearance operations.**

The meeting and merging of the few Navy salvage officers and a 50-man detachment of Army divers assigned to the U.S. Army Diving Detachment (Provisional), Seventh Transportation Group, was both fortuitous and productive for all concerned. Essentially, the Navy had a harbor clearance CONOPS and real requirements in hand, but lacked the MDSU detachment and equipment. The Army Diving Detachment team had the people and equipment but no active task assignments. Three detachments were deployed to establish operating bases in Al Dammam and Al Jubayl to perform ship husbandry, port security sweeps and port restoration contingency operations.

The Army divers considered themselves under the operational control of the Navy and CDR Evans in a salvage advisory role for the work that took place in the port of Shuaibah and the survey operation for the port of Shuwiykh. The Army divers and crane crews were exceptionally cooperative. The Army transportation people were cooperative but had other requirements of higher priority.

#### **Ash Shuaibah Harbor.**

In response to the request by the Kuwait government, CTG 151.12 was tasked to salvage a Soviet-made OSA-II fast attack missile boat that had been damaged during an air strike on Shuaibah harbor and sank. The OSA II, weighing 200 tons at full load and 165 tons light, had two STYX missiles with 1100 lb. warheads still in the launchers. It appeared that the missile in the first launcher went "high order" and probably caused the boat to sink.

The Army's 140-ton pier crane and 100-ton floating crane could not lift the boat free of the surface intact. The decision was made to cut the missile-loaded launchers off in the water using oxy-arc Broco rods. After an EOD team rendered the warhead and hypergolic rocket motors safe, Army divers worked to remove the missiles and launchers. On the third attempt to cut through an electrical umbilical, the solid reel rocket booster ignited, launching the missile through the launcher outer door for a distance of 20 ft underwater. The rocket motor separated from the guidance and control section. There were no injuries but a very tense moment for all involved.

Finally, with both cranes lifting together, the boat was brought to the surface and remaining missile launchers were removed with an acetylene torch. Borrowing the only other crane in the harbor not in use at the time, belonging to one of the oil firefighting companies, the one remaining missile was removed from the launcher and loaded on a truck for disposal.

The only other sunken obstructions in Shuaibah were a small tug, two pilot boats and a pontoon in the barge harbor area. Other vessels in the main harbor area were damaged but not sunk including a burned out Panamanian freighter, a Kuwaiti self-propelled barge(AA gunboat), and two Iraqi tugs. CDR Jim Cosper, USN (1140), Commanding Officer MDSU-2, Master Diver McLaughlin from MDSU-2 and two MDSU-1 (Bahrain Chamber Support Team)men assigned to 151.12 pumped the craft and moved them away from the berths the Kuwait government wanted cleared.

### **Shuwaikh Harbor. (Note the attached sketch)**

After completing a thorough survey of the port of Shuwykh in Kuwait City (note the attached sketch), a meeting was held with CAPT Nabari, a senior Kuwaiti naval officer who was Port Director of all Kuwaiti ports, representatives of the U.S. Army Corps of Engineers, CAPT Pat Shepherd (CTG 151.12), and CDR Evans. CAPT Nabari was presented a proposal for using Navy MDSU personnel and USS BEAUFORT to clear the harbor if the Kuwait government would hire the necessary heavy-lift equipment. The Navy would benefit from the operational experience, and Kuwait would have a cleared harbor. CAPT Nabari indicated that only the deep-water berth required clearing, and that he planned to hire a Kuwaiti company to do that. The remainder of the harbor would be cleared as necessary. The deep water berth was obstructed by two pier cranes that the Iraqis had toppled into the water.

The other significant salvage tasks were:

- One sunken and one burned-out tug.
- A cement processing barge holed in the starboard bow.
- One Vosper boat sunken under the cement processing barge (reported by French Commandos).
- One sunken OSA I with three STYX missiles and no apparent structural damage.

### **Ras Al Qulayah**

The Kuwait Naval Base was located in the harbor of Ras Al Qulayah. A salvage team was sent south to Ras Al Qulayah to keep one YW from sinking. There were numerous sunken small craft that the passing 100 ton floating crane could have easily picked up.

The decision not to conduct harbor clearance operations was due in part to a concern for spending Navy dollars on what were then economic and humanitarian projects, and concern for the impropriety of the U.S. Navy competing with commercial salvage companies that were capable and eager to get the work.

### **4. ESSM Equipment.**

The NAVSEA representative, Mr. Jerry Totten, and CAPT Delaplane made the decision concerning what equipment would remain in Bahrain. It would have been useful to have left a few hydraulic-submersible pumps behind based on experience with the EXXON HOUSTON. The master of a tanker would prefer hydraulic-submersible pumps for moving liquid cargo versus 440 volt electrical pumps and deck generators.

### **5. Communications.**

The two INMARSAT telephone sets provided excellent real-time communications worldwide. Most of the information involved in the salvage projects was unclassified. Most of the standard Navy messages and voice communications were classified, and in many instances over-classified. CTG 151.12 established an HF communication network with ships using commercially purchased equipment installed at SRUDET Bahrain. The HF was an after-thought, and used infrequently due to availability of regular telephones and INMARSAT.

## **6. MDSU Offship Firefighting Capability.**

With \$0.5M in augmentation funds, MDSU-1 purchased enough firefighting equipment to outfit a 50-man team. The only equipment lacking were portable monitors that were available from the ESSM base. The Fleet Firefighting School in Pearl Harbor provided repetitive training for two 10-man teams and several six-man teams. The teams were prepared to go aboard the commercial salvage tugs in the Gulf as special teams. Mr. Les Williams of Boots & Coots addressed the teams on offship firefighting techniques and use of foam. The MDSU deployment plan had CDR Evans installing himself aboard SMIT NEW YORK as an afloat command center with communications by INMARSAT or HF with all other salvage vessels and the Force Salvage Coordinator. The commercial salvage ships were already on contract. With exception of the Leis-Leis package aboard SMIT MADURA, the ships had basic salvage crews and would have relied heavily on the MDSU teams for crew augmentation to operate the ESSM equipment and firefighting equipment. SMIT NEW YORK had a 17-man crew which included some extras not normally aboard. A NAVSEA portable firefighting monitor would be mounted on the fantail.

## **7. The Most Significant Problems and Opportunities.**

A sizable harbor clearance project such as Mina Ash Shuwaikh requires a MDSU detachment and equipment, including heavy-lift capability. The people were readily available from MDSU ONE. The Navy does not have organic heavy-lift capability and must hire a commercial 1000-ton sheerleg or Ring crane. Had the Navy been tasked with clearing Shuwaikh harbor with use of the SMIT sheerleg from Singapore, the project would have been completed in 5-6 weeks. The Netherlands government was prepared to pay all mobilization/demobilization with the Navy covering the 12,500 daily rate. The flag officers were overly concerned with the cost of leasing commercial heavy-lift equipment and did not seem to appreciate higher costs of Navy ownership and maintenance, considering the infrequent need of such unique equipment.

This presents an opportunity for devising salvage CONOPS that would include harbor clearance and a provision for having special equipment such as a heavy-lift sheerleg crane under a contingency contract for lease and delivery to the theater of conflict. The cost should be "invisible" and budgeted as a Navy cost under the joint command mobilization plan.

## **8. Recommendations.**

If CDR Evans had been responsible for planning and selecting a salvage force for the Gulf War, he would have arranged, in advance, deployment of the following assets:

- The YRST-1 (or similar salvage support barge) loaded aboard a commercially-chartered heavy-lift craft and leave in Bahrain for further tow around the Gulf wherever needed. YRST-1 is an ideal working platform with berthing, equipment and small boat storage, certified chamber and dive system, light-lift capability and maintenance shop facilities.
- At least one LCM-8 or LWT-1 presently assigned to MDSU-1.
- Small pumps, compressors, etc., belonging to MDSU-1, with heavier salvage equipment available from the ESSM base.
- An ESSM equipment base positioned in-theater, as close to the action area as possible. Sharjah was as good a place as any with air lift available, and was less populated than Bahrain.
- Improved communications using INMARSAT or cellular phone.

The Force Salvage Coordinator (FSC) should be assigned to a senior afloat staff. In the Arabian Gulf, the geography was such that CAPT Shepherd, who was the FSC, was able to function more effectively from a shore-based location than if he had been aboard a flagship or tender. This would not be advantageous in an open-ocean situation or a remote location.

There was a good working relationship among SRUDET Bahrain, the salvage officers and the SMIT senior representative and vessels. CAPT Shepherd, USN (1110), as OIC SRUDET Bahrain/CTG 151.12, was a dynamic leader with great credibility who may have had a different agenda at times, but kept things moving and accomplished many tasks. The two SMIT masters were extremely cooperative, doing what was asked of them, freely offering advice, and always flexible to changes in plans. Both NEW YORK and MADURA proceeded north without hesitation, to Al Ahmadi following the plotted channels that were swept through mine fields. The SMIT vessels did not steam at night when operating north of 27°-30°N, preferring to anchor or drift with the current.

USS BEAUFORT (ATS 2) was under the operational control of CTG 151.12. and performed all assigned tasks in an excellent manner.

## **Interview Report**

**Interviewee:** CAPT Richard P. Fiske, USN (1440)  
Supervisor of Salvage and Diving  
Director of Ocean Engineering  
Naval Sea Systems Command  
Code SEA 00C  
Washington, DC 20362-5101

**Interviewer:** John Allen  
Jamestown Marine Services, Inc.

Michael Mulcahy  
Jamestown Marine Services, Inc.

**Date:** 20 June 1991      **Duration:** 1 Hr 15 min.

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### **1. Background.**

During the course of this interview, CAPT Fiske provided thoughtful insight into the salvage planning and interaction of salvage events of the Gulf War as viewed from the supporting role of Supervisor of Salvage and Diving. If circumstances had permitted him to go to Bahrain, he was well qualified to have served as the Fleet Salvage Coordinator (FSC). CAPT Fiske's experience in salvage operations and management includes assignments as SIXTHFLT Salvage Officer and supervisor of emergent repairs at the Ship Repair Unit Detachment (SRUDET) Bahrain. In addition, he has served as a tender repair officer. Based on this experience and the involvement of his office in the events occurring in the Arabian Gulf, CAPT Fiske offered a perceptive view of OPERATION DESERT SHIELD and DESERT STORM salvage problems and opportunities. The following writeup captures the highlights of the interview.

### **2. Appropriate Command Location for Fleet Salvage Coordinator (FSC).**

The FSC comes into play when multiple casualties require establishing Fleet salvage priorities. The FSC should be afloat, assigned to the staff of COMUSNAVCENT, to assist in preparation of CONOPS, OPLANS and OPTASKS and provide input and advice to the Battle Force Commander (BFC) on issues affecting salvage requirements and assets.

In the ideal situation, an O-5 FSC would have been assigned to the Fleet staff afloat, with an O-6 Engineering Duty Officer managing shoreside repairs. If the FSC is afloat, he can coordinate casualty response better than he could if he were encumbered with shoreside repair concerns. A subordinate, either ashore with the maintenance staff or afloat with the FSC, should be a salvage engineer with the ability to break off and go on-site.

### **3. Visibility of Salvage costs and the Requirement for a SUPSALV Contracting Officer's Technical Representative In-Theater.**

In relying heavily on commercial salvage assets and services funded through NAVSEA 00C contracts, SUPSALV supported the mobilization, wartime, and demobilization demands for salvage with a peacetime funding accountability system. Funding is a far greater issue when using contractor salvage assets compared to the less visible fleet funding accountability when using organic assets. Government-owned and operated salvage assets—active Navy and MSC salvage ships and personnel, MDSU, and flyaway equipment—can be used for whatever activities their controlling commands wish. SUPSALV cannot afford a year-round contract to ensure that a contractor will be available for the 10 percent of operating time that he will be needed. The Navy can, however, afford a contractor who will commit to providing services on a delivery-order basis. By contracting on a delivery-order basis, the 45 personnel working in the SUPSALV organization oversee management of \$300 million worth of ESSM equipment and a \$50 million annual operating budget.

In-theater approval of work performed on a delivery-order basis strained the relationship between NAVSEA 00C and the operational fleet commander. Although the in-theater philosophy was that whatever the Fleet needed for the war effort would be provided by the Navy, SUPSALV's specific guidance from VADM P.M. Hekman and RADM W.H. Cantrell, Commander Naval Sea Systems Command, was to ensure that funding from the warfare sponsor, OP 03, was in place prior to committing resources. By initially committing some of the normal operating funds for ESSM management and salvage contingency requirements, SUPSALV was able to position an ESSM base in-theater and support SMIT vessel operations before receiving dedicated funds. RADM Cantrell, supported by VADM Hekman's letter (attached) identified salvage costs and requested funding from the Resource Sponsor, OPNAV (OP-03). Once an OPNAV commitment for funding had been made and appropriate documentation generated, SUPSALV had approval to incur obligations and collect the bills later. In this way, salvage needs could be met without delay.

The peacetime accountability system applied to a wartime scenario could also have been replaced by a system in which costs would be less visible to the Fleet. If 00C received a contingency funding commitment of \$6 million per month, SUPSALV could authorize the COTR to do whatever was required in-theater, independent of funding.

### **4. COTR Issue.**

00C established a support group that included Contracting Officer's Technical Representatives (COTRs) who had the experience in salvage and UWSH, and were given contracting authority. This allowed near-instant contracting of assets through the SUPSALV salvage contract. This was exemplified by SUPSALV's rapid build-up of commercial salvage/towing assets to support DESERT STORM. The initial single commercial salvage vessel on hire 3 January blossomed into a small fleet with one USN salvage ship, three commercial salvage vessels, one specially outfitted firefighting ship, and several offshore supply boats by 18 January, covering the entire Gulf OPAREA. This was instant response compared to the EODGRU experience when they utilized normal contracting procedures to obtain and outfit two support boats; after four months they were still fighting insurance questions. Support assets were quickly put in place by contract. However, contracted are no substitute for the USN salvage ship, which was the only vessel that could be directed to go in harms way, and did.

### **5. Commercial Support of USN Salvage.**

Commercial salvors' profit potential in DESERT SHIELD/DESERT STORM was several orders of magnitude less than in the Iran/Iraq War, where Lloyds Open Form was the basis for ship salvage, and salvors could recover up to 12.5% of a salvaged ship's value. Since the U.S. Navy pays a salvor only a day rate and potential award fee, there is no incentive for commercial salvors to support USN salvage requirements except under long-term contract.

## **6. ESSM Sharjah Warehouse.**

The SMIT/Rockwater facility in Sharjah, U.A.E., was adequate for storing and deploying ESSM gear and providing office space. In terms of response time, it would have been preferable to locate the ESSM facility 150 miles closer to the action in the North. It was logical to co-locate tugboat coordination with the ESSM gear, the primary function of which was to support salvage tug operations.

## **7. Salvage Assets/Equipment and the Timed-Phased Force and Deployment Data (TPFDD) System.**

SUPSALV's ESSM equipment has now been placed in the TPFDD file. The extra day or two that it took to accomplish placement on TPFDD will prove worthwhile the next time a massive ESSM airlift is needed. Inclusion in TPFDD, in combination with an OPLAN calling out specifics of equipment shipment, should streamline wartime salvage logistics.

## **8. Prepositioned Port Clearance Assets.**

M/V CORMORANT is a Float-On/Float-Off (FLO/FLO) vessel that is part of the Maritime Prepositioned Force (MPF), based on Diego Garcia. It was used to sealift critical Army diving and port clearance equipment to the Arabian Gulf. The Army Central Command asset is on long-term charter through MSC contract. The Army has OPCON. Funding is not an issue during a crisis, since the ship is funded under the MPF program.

In order to evaluate the desirability of the Navy using the same sort of approach, a cost study would be required. How much was paid for CORMORANT during the years she sat in Diego Garcia? Prepositioning ships generally run about \$60-70K per day. With some ESSM equipment now in position in Bahrain, logistics contracting is minimized. Again, OPLAN/OPORD preplanning for missions, ships, MDSU gear, and people is imperative. Perhaps a mobilization contingency contract is appropriate. Defined, area-specific requirements are the key.

## **9. Functional Priorities of Salvage.**

Salvage, firefighting and harbor clearance are generally higher operational priorities than search and recovery activities.

Harbor clearance has two operational aspects: clearing for access to pier space for over-the-beach troop support, and clearance/wreck removal. The latter category is more long-term and asset-intensive; therefore, contractors are more involved in this phase.

## **10. Problems Encountered.**

It is an educational challenge for operators to recognize the necessity of a "firehouse function" such as salvage. When they don't need a salvage ship, they concentrate on other things.

From my admittedly limited perspective, there seemed to be a disconnect among Commanders in the Gulf, in PACFLT and in LANTFLT. Although both Fleets ostensibly tried to fulfill salvage requirements for the forces in the Gulf, and salvage ships were part of this requirement, RADM Taylor (CTF 151) questioned why there was only one USN salvage vessel in-theater. The reason could be that because the required salvage support level was not articulated in the OPORDERS, incremental salvage assets had to be requested by NAVCENT, and neither PACFLT nor LANTFLT received such a request in a timely fashion.

Initially, making salvage a subset of logistics and maintenance, overseen by the NAVCENT Chief of Staff for Logistics, a supply officer, was, in retrospect, a poor decision. Operational salvage decisions would have been more appropriately made by a line officer assigned to an operational command.

## **11. Lessons Learned.**

There should be hard-copy OPORDER planning to ensure the presence and integration of salvage assets as operational contributors to the Fleet combat effort. The attention of BFCs was engaged by higher priorities than salvage. If salvage guidance had been written into standing OPORDERS, appropriate salvage force levels would have been brought in-theater automatically, with no need for intervention at the BFC level.

Had there been sufficient planning for USN salvage ships, the Navy would have had less of a need for commercial salvage assistance. Given the need, however, SUPSALV was able to contract quickly for these services because a contract vehicle was already in place.

SUPSALV salvage ship contracting is particularly effective for quick-response operations. MSC should take the contracting lead for long-term tow boat charters that are beyond USN organic capability.

The wartime role of SUPSALV should also concentrate on clearance functions, because other than commercial secondary support and ESSM, provision should already have been made in the OPLAN for casualty control using organic salvage assets.

The Fleet and SUPSALV should participate in joint salvage planning exercises with the U.S. Army, but the Fleet first must be made aware of the composition and capabilities of the USN salvage forces.

In an age of limited salvage resources, it is important to distinguish between operationally critical salvage jobs and those that have far less urgency and no operational impact. An example of DESERT SHIELD/DESERT STORM harbor clearance that was not operationally required was the OSA II missile boat salvage in Shuaibah Harbor. It was necessary more as an EOD function than as an operational requirement.

Navy salvage resources in-theater were barely enough, nearly too late.

## **12. Recommended Changes.**

Sufficient salvage ships should be deployed in-theater to accomplish the salvage mission.

In future conflicts with an attendant missile threat, consideration should be given to installing Close-In Weapons Systems (CIWS) or equivalent on salvage vessels, so that the vessels would be less of a protection burden to the FLTCOM.

## **Interview Report**

**Interviewee:**     RADM John B. LaPlante, USN  
                      Commander, Amphibious Group TWO  
                      Building 2001  
                      Naval Amphibious Base, Little Creek  
                      Norfolk, VA 23521-5000

**Interviewer:**     John Allen  
                      Jamestown Marine Services, Inc.  
  
                      Michael Mulcahy  
                      Jamestown Marine Services, Inc.

**Date:** 31 May 1991     **Duration:** 1 Hour 10 Min

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### **1. Background.**

During the course of this interview, Admiral LaPlante provided thoughtful insight into the salvage demands and events of the Gulf War as they related to support of amphibious operations. Based on his experiences as the Amphibious Force Commander, CTF 156, and his long professional association with and knowledge of amphibious warfare, he offered an interesting perception of OPERATION DESERT SHIELD AND DESERT STORM salvage problems and opportunities. The following write-up captures the highlights of the interview session.

Admiral LaPlante in-chopped to CINCCENT on 9 September 1990, arriving in the North Arabian Sea on 13 September. Except for brief excursions into the Gulf, the Amphibious Task Force operated in the North Arabian Sea until 29-30 January when the entire amphibious force entered the Gulf and remained there until the war was over. The rationale for remaining outside the Arabian Gulf included logistics and training considerations.

### **2. Salvage Support for the Amphibious Objectives Area (AOA).**

The Amphibious Force Commander controls the AOA. Nothing on the surface or in the air moves without his approval. While he is not a salvor, he establishes salvage priorities. An extreme but realistic situation of high priority would be a damaged boat grounded or sunk in a mine swept boat lane that cuts through a heavily mined area. It became apparent early on (October-November time frame) that there was not a salvage organization in place. In discussions with NAVCENT staff and formally by message, CTF 156's requirements for naval support from the other task force commanders within the naval component, including salvage, were identified. It was requested that once the AOA was activated, a salvage group commander be designated and chopped to CTF 156 so that the salvage commander was under CTF 156 tactical control before the amphibious assault started.

As it happened, salvage was placed under CTF 151.12 which did not make much sense since salvage and repair are different functions occurring in different locations. It appeared that battle damage repair was well organized and well positioned in contrast to salvage forces. For about a month beginning on 14 January, while a huge maintenance and repair organization was being built up and salvage was added as an afterthought, CTF 156 was in the final rehearsal phase for an amphibious operation. On 15 January, the amphibious augmentation showed up and CTF 156 went from one to two MEBs and from 13 to 31 amphibious ships (the total assigned to the CTF was 43 ships). Salvage readiness in support of an amphibious assault was in question with regard to

available salvage assets. However, it was assumed that when the assault began and forces were in the AOA, salvage forces under a group or unit commander would enter the AOA for supporting the operations.

Given certain knowledge that mining had occurred and was continuing, CTF 156 had to plan on losing some ships and assault craft to mine strikes, and had to aggressively seek assistance in standing up salvage capability. On several occasions, this concern was addressed to the NAVCENT staff. Specific salvage assets, however, were not identified.

CTF 156 was comfortable with BDR and battle damage assessment as evidenced by the USS TRIPOLI incident. However, a Theater Salvage Coordinator would have been better assigned directly to CTF 151 staff rather than NAVCENT (CTF 150) or CTF 156, or Commander, Naval Logistics Support Forces (CTG 150.3), who was responsible for the shore logistics infrastructure.

### **3. Wartime Salvage Requirements for Dealing with the Mine Threat in the AOA.**

On the first day of OPERATION DESERT STORM, the principal enemy threat was Badger/Mirage air strikes delivering SILKWORM/EXOCET missiles. When the Iraqis chose not to launch a major air strike, the mine strike became the principal threat to the naval component of the coalition forces. CTF 156 wanted very much to be able to predict, at any given time, the number of ships and craft that might be damaged or lost due to mine strikes if and when the amphibious operation was stood up. The inability to predict damage and casualties from mine strikes is a significant mine countermeasures lesson learned from the OPERATION DESERT STORM experience. With some knowledge of the total number of moored contact mines and bottom influence mines laid in a given ocean area, the MCM Navy can estimate the number of mines that can be cleared after sweeping the area for a certain number of days. For example, after 30 days of sweeping an area mined with 1000 mines, there might be an 80 percent confidence level that 60 percent of the mines have been accounted for. What is not known is the estimated ship and craft casualties that an amphibious force can expect while operating in the area from the remaining mines spread randomly over that area of ocean. There should be a data model for making these estimates that enables the amphibious tactical commander to calculate the risks of vessel damage and losses, and subsequently, the probability of success of an amphibious assault operation. This estimate should be used to determine the sizing of salvage forces required. These models may exist, but were not available in-theater.

The Iraqis had very sophisticated mines that they used in a very unsophisticated fashion. They laid mines only in six well defined fields and a few barriers (see attached chart). Had they covertly laid sophisticated mines in the southern Gulf area and off Ad Dammam and Al Jubail, the carrier battle force may not have entered the Gulf when it did, its effectiveness and sortie generation rate would have been much reduced, and the seaborne buildup would have been placed at risk. Mines would have seriously disrupted the waterborne logistics flow of ammunition and other war materials. The few mine sweeps and MCM ships on-scene at the time would have been inadequate if the Iraqis had been smarter in mine deployment.

### **4. Major Problems With Respect to Deployment of Salvage Forces.**

From a CTF 156 perspective, the late deployment of salvage assets could have been a major problem. There were many ships and lots of mines in the Gulf, and yet a salvage organization was not stood up until late February. When, on 2 January, USNS ANDREW J. HIGGINS (T-AO 190) went hard aground on an uncharted "pinnacle" in the Gulf of Oman just south of Masirah, the ship was directly supporting the Amphibious Force. The SEVENTHFLT salvage officer had to fly in from Subic Bay, RP., arriving a couple of days after the grounding. USS IWO JIMA, in the absence of a salvage officer was designated On-Scene Commander and initiated appropriate action, including having a lightering vessel, M/V COURIER, and commercial salvage tug, M/V SMIT NEW YORK, standing by to offload liquid cargo and perform emergency salvage as required until a salvage officer arrived on-scene. Not until LCDR Murphy (CTU 73.6.8) arrived on-scene and OPCON shifted to CTF 73, did fuel offload begin, eventually making HIGGINS lively on 5 January and able to make way under her own power with SMIT NEW YORK escorting. Proceeding at a 4 kts SOA, HIGGINS went to a MODLOC

50 miles off Fujayra, U.A.E. to lighten the remaining fuel cargo, and releasing SMIT NEW YORK. As it turned out, HIGGINS was a liability from 2 January until 7 March 1991.

The Amphibious Task Force needed a salvage organization with sufficient assets (a minimum of two salvage tugs) stood up much earlier. Speaking as an amphibious expert and admittedly not a salvage expert, Admiral LaPlante felt that with the two ships, USS BEAUFORT and SMIT NEW YORK, he barely had the capability to control the AOA, keep damaged ships out of harm's way, and clear boat lanes. There were insufficient salvage and towing assets in the Gulf to tow damaged ships south to Dubai or other locations for battle damage repair or to perform other salvage tasks other than AOA support. USNS HIGGINS, while a rather simple salvage operation, exemplifies the avoidable delayed salvage response resulting from late deployment of a responsive salvage organization and assets and the type of noncombat salvage task that AOA support would have preempted.

## **5. The OPTASK for Salvage.**

The appropriate functional Task Force Commander is responsible for producing the OPTASK for his area of functional responsibility, e.g., ASW, AAW, EW, Amphibious warfare, etc. Although there was no OPTASK published for salvage, CTF 156 would be a probable user of salvage and would expect a CAPT Shepherd (CTU 151.12) or a CAPT Delaplane to produce a salvage OPTASK for him. It appeared that one was in the making and salvage assets were being geared up about the time that the decision was made in mid-February that the amphibious assault would be postponed. The reason for postponement was collateral damage, a big concern of the Kuwaiti, and not the mine threat. During DESERT SHIELD, the threat of an amphibious assault was mainly a deterrent. Consequently, the Iraqis had six months to build the most elaborate, innovative, and deep beach defense that has ever been built, and which was well supported by up to 11 divisions at least two of which were mechanized. The collateral damage to the Kuwaiti beach front would have been extreme. The Iraqis had a very accurate estimate of where a beach assault would occur, which was not surprising, considering information available in the news and the very few beach areas where the approach gradient was suitable for an amphibious assault.

The amphibious assault was planned for a certain date based on G-Day (start of the ground war) in order to secure a port facility or beach head with marines and establish a resupply link for the ground forces as they pressed north to Kuwait City. Raid operations and deception operations were staged pre-G-Day to confuse the Iraqis, who were totally convinced that an amphibious assault was imminent. Had an amphibious assault taken place, salvage assets would have been hard-pressed to support the assault and the initial port restoration required to enable logistics throughput.

## Interview Record

Interviewee: CDR Bert Marsh, USN  
Naval Sea Systems Command  
ATTN: CODE SEA-00C2  
Washington, DC 20362-5101

Interviewers: John Allen  
Jamestown Marine Services, Inc.  
  
Michael Mulcahy  
Jamestown Marine Services, Inc.

Date: 26 April 1991     Duration: 3.5 hours

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### 1. Background.

During the course of this interview, CDR Marsh provided valuable insights into salvage engineering requirements as expressed by the commanding officers of the two stricken U.S. Navy combatants and contributed significantly to understanding the operating environment and needs for ship salvage services in OPERATION DESERT SHIELD/STORM. Through his description of the in-theater chain of command in which SUPSALV worked, CDR Marsh enabled a greater appreciation of regional command realities and some personal reflections on how the salvage command structure might be used more advantageously in future combat scenarios.

Key dates for CDR Marsh's involvement in OPERATION DESERT SHIELD/STORM were:

- 4 January 1991     Arrived in Sharjah U.A.E., began support for USNS HIGGINS (T-AO 190) grounding off Masirah, Oman. Assisted OTC LCDR Tom Murphy, USN, in coordinating refloating operations.
- 7 January     With Roger Elliott, SMIT-TAK, briefed NAVCENT staff, Bahrain, regarding the need for USN salvage presence in the Arabian Gulf region. Result: VADM Aurther, NAVCENT, assigned responsibility for salvage coordination to SRUDETBAHRAIN, CTG 151.12, under CMEF CTF 151.
- 18 February     USS TRIPOLI (LPH 10) hit a floating mine in Arabian Gulf off Kuwait coast. Coordinated BDA efforts.  
  
USS PRINCETON (CG 59) hit influence mine in same general area as TRIPOLI. Using POSSE computer program, provided ship salvage engineering calculations to assess ship's strength and structural integrity and recommend actions to vessel CO.
- 5 March     Relieved as SUPSALVREP by Steve Barton.

## **2. Initial Mission.**

The purpose of sending a second (Mr. Jim Bladh being the first) NAVSEA Representative to the Arabian Gulf region was to set up the U.S. Navy's Emergency Ship Salvage Material (ESSM) base in Sharjah, U.A.E. This involved liaison with the Naval Central Command (NAVCENT), Commander Middle East Force (CMEF) and COMNAVLOGSUPFOR staffs in Bahrain, to discuss how best to utilize U.S. Navy salvage assets in-theater. The mission rapidly evolved to include providing salvage engineering assistance to the Military Sealift Command (MSC) vessel USNS ANDREW J. HIGGINS (T-AO 190) and the U.S. Navy vessels USS TRIPOLI (LPD-10) and USS PRINCETON (CG 59).

## **3. Chain of Command.**

CDR Marsh served as Supervisor of Salvage (SUPSALV) representative in the Arabian Gulf, attached to the Ship Repair Unit Detachment Bahrain (SRUDET Bahrain). Its Commanding Officer Capt. Patrick Shepherd, USN, reported to Commander, Task Force 63, Naples, and to Commander, U.S. Navy Central Command (COMNAVCENT) through Commander, Middle East Force (CMEF), who was also Commander, Task Force 151.

## **4. USNS ANDREW J. HIGGINS (TA-O 190) Grounding.**

On January 2, 1991, the USNS ANDREW J. HIGGINS ran aground on an "uncharted reef" near al Masirah, off the Oman coast. Although not a combat casualty, HIGGINS is a combat logistics support vessel that required salvage assistance in support of sealift during mobilization.

**CASUALTY RESPONSE.** On January 3, the Military Sealift Command's (MSC) Washington Casualty Assistance Team (CAT) notified the SUPSALV office of the casualty and the possible requirement for assistance. SUPSALV advanced by one day its existing plan to place on hire the salvage vessel SMIT NEW YORK (SNY), operated by its Western Pacific Zone salvage contractor SMIT-TAK Towage and Salvage. SNY steamed to Mesirah from its location in Fujayrah, U.A.E., a 15-hour steam southeast.

LCDR Tom Murphy, from Commander, Task Group 73 (CTF 73), Subic Bay, Philippines, was sent as the salvage officer and, as the salvage progressed, became Officer in Tactical Command (OTC). CDR Marsh assisted him as required.

**DAMAGE.** The grounding tore out the bottom of the HIGGINS from just aft of the forward perpendicular to amidships, ripping open cargo tanks 1-7 throughout this distance. Most of the holed tanks were located on centerline or the starboard side, with some port-side tanks holed. According to a SMIT-TAK report to SUPSALV on January 4, only 11 of 34 tanks remained intact after the grounding.

HIGGINS was impaled on the reef but appeared likely to float off if lightened sufficiently. The OTC directed lightering of the cargo to the chartered civilian tanker M/V COURIER. During this evolution, the SNY was made up to the COURIER's stern, acting as a drogue chute to prevent that vessel from being swept by currents into HIGGINS during lightering operations.

**RESOLUTION.** HIGGINS came off the reef on the morning of January 5, still seeping some oil. With the concurrence of the MSC, the OTC decided to sail the HIGGINS under her own power, escorted by the SNY, through the Strait of Hormuz to a Dubai drydock for repairs. Before being permitted to pass through the Strait, the ship had to offload further cargo until the seepage had stopped. The cargo was pumped to the chartered tanker GEORGIA V and MSC tanker USNS WALTER S. DALE. Transit to the lightering position took six days at 4-5 knots. The HIGGINS arrived in Dubai on January 15, after a total steam of 10 days from its grounding position.

## **5. USS TRIPOLI (LPH 10) Mine Hit.**

On February 18, 1991, at approximately 0550 local time, USS TRIPOLI hit a floating mine in the Arabian Gulf off Kuwait.

OFF-SHIP CASUALTY RESPONSE. CAPT Shepherd, COSRUDETBAHRAIN, (CTG 151.12) directed CDR Marsh, acting as OIC of a Battle Damage Assessment Team (BDAT) sent from the tender USS JASON in Bahrain, to proceed by fastest possible means to the casualty site. Capt. Shepherd arranged transport for the 12-person team through LOGSUPFOR (CTG 150.3), who provided an SH-53 helicopter. CDR Marsh's BDAT team was drawn from the JASON's standing Rescue and Assistance team (RAT).

The BDAT took the Program of Ship Salvage Engineering (*POSSE*), the software program developed under SUPSALV sponsorship, several P-250 pumps, the "Jaws of Life," and some blowers to the TRIPOLI. The team left JASON at 0930. When it arrived on board TRIPOLI at 1115 local time, the vessel's chief engineer had trim control, but the vessel had exceeded its design forward water level; use of an aft trim tank could correct the trim. Transverse stability could be controlled by moving its helicopters around on deck. Therefore, the vessel's stability was good, and CDR Marsh estimated 6-8 ft. of GM remaining. The mine explosion impact area was in the vicinity of FR 18. Flooding extended aft to FR 31, and included JP-5 fuel tanks. EOD divers reported a hole in the vessel's starboard side measuring approximately 16 x 25 ft. CDR Marsh advised the Commanding Officer that a major problem would occur if the vessel sustained another mine hit; i.e., bulkhead 31 might carry away. In the meantime, based upon radio traffic monitored aboard TRIPOLI, it was determined that the PRINCETON was in worse shape than TRIPOLI as a result of damage sustained when PRINCETON hit a mine less than two hours after TRIPOLI (see below). After approximately 1.5 hours aboard TRIPOLI, CDR Marsh was transported to the PRINCETON by helo, where he provided structural integrity and stability engineering services.

RESOLUTION. TRIPOLI was escorted to Bahrain (ASRY) for drydocking and repairs by USS BEAUFORT (ATS 2).

## 6. USS PRINCETON (CG 59) Mine Hit

On February 18, 1991, at approximately 0718 local time, USS PRINCETON hit an influence mine in the Arabian Gulf off Kuwait.

OFF-SHIP CASUALTY RESPONSE. CDR Marsh, already at sea aboard TRIPOLI, contacted PRINCETON commanding officer by radio, offering him assistance ranging from a salvage engineer to a rescue/assistance team and BDAT. The PRINCETON CO replied that he needed only a salvage engineer's structural assessment and advice, indicating that:

- The vessel's damage had been contained by ship's force.
- Two injured personnel had been medevaced off the ship.
- PRINCETON had a potential strength problem, and he had questions regarding structural integrity.

CDR Marsh was transported from USS TRIPOLI to the ship by PRINCETON's LAMPS helicopter, arriving less than 10 minutes after liftoff. On arrival, he ascertained the following facts regarding damage:

- Superstructure split at the quarterdeck on both sides, from 01 to 03 levels. Separation 5-6" in places.
- Relatively little damage on main deck underneath the damaged superstructure. Longitudinales in "fairly good condition."
- Minor buckling @ FR 220.
- Major buckling @ FR 380.
- FR 472—worst damage, sideshell damaged to waterline and the second platform deck—major damage.
- Flooding minor—controlled by eductors.
- Port rudder jammed—could not be jacked over by emergency method. (It finally was freed by combination of jig and comealong.) Stbd. shaft ok.

CO asked for advice on towing vs. ship power to move out of the area, CDR Marsh advised that it was essential that no vibration of the stern area be transmitted from the screws. PRINCETON was taken in tow by the USS BEAUFORT at approximately 1600 local time, with the USS ADROIT (MSO 509) leading the way out of the minefield.

CDR Marsh used a laptop computer and the *POSSE* program to perform crucial strength calculations. Strength of the stern was central to the decision to drydock the ship for repairs.

CDR Marsh used:

- Sealed distances taken from arrangement drawings.
- Section drawings from Sta. 15.
- A list of inertials and distances to the neutral axis for the deck and keel of this class of cruiser.
- Hand measurements of thickness.

to develop a section modulus undamaged and, ultimately, subtracted the sighted damage to give a damaged section modulus at FR 472. This was utilized along with a stored weight distribution to estimate the still water bending stresses at FR 472.

Strength calculations indicated that stress on the FR 472 area was nearly 10 times its normal stress in still water (59 ksi vice 7 ksi). CDR Marsh advised the CO that the vessel had to be repaired in a Arabian Gulf drydock—that a long transit before repairs was untenable.

At 1745 on February 19 the SMIT-TAK vessel SNY relieved BEAUFORT and took PRINCETON in tow, destination Dubai. It was likely that the vessel would break up if it encountered heavy weather. As weather in the operations area deteriorated, the destination was changed to Bahrain at 0650 on February 20. By 0305 on February 21, the SNY passed PRINCETON to harbor tugs for docking in Bahrain.

## 7. Lessons Learned/Recommended Changes.

A force salvage officer should have been attached to the unified command, such as the NAVCENT staff, and should have been an 1140 Captain or senior Commander.

**EFFECTIVENESS OF SALVAGE FORCE.** Assets in-theater proved adequate for the needs of the war, but would have been woefully inadequate if the full amphibious landing had developed as planned. The harbor clearance component would have been nearly nonexistent; to clear a large harbor in 5-10 days would require hundreds of personnel and heavy equipment—e.g., large sheerlegs, etc. This would have required advance planning.

USS BEAUFORT was excellent.

CMEF and NAVCENTCOM staffs were reluctant to bring in new salvage personnel (such as MDSU teams), with the rationale that diving capability already in-theater (e.g., US Army, EOD, UCT, etc.) was sufficient to do whatever was required. However, COs of these divers were reluctant to commit their personnel and equipment in advance at the expense of readiness for their stated missions.

SRUDETBAH wanted to run salvage exercises w/ EOD/UCT divers using ESSM gear on commercial tugs, (when it became known that MDSUs would not be coming) to prepare for amphibious operations, to build firefighting/salvage expertise in-theater. BUT THE PROBLEM DID NOT HAVE ATTENTION AT HIGH ENOUGH LEVELS. WITHIN THE UNIFIED COMMAND, NO ONE AT A LEVEL HIGH ENOUGH TO DIRECT THE PRIORITY WOULD ALLOCATE ASSETS (I.E., DIVE TEAMS) TO SALVAGE.

When the Salvage Assistance Response Team (SART) concept materializes in the Fleet, it should include salvage engineering officers with *POSSE* programs. In this way you offer not only the RAT and firefighting capability, but also ability to do on-scene structural/stability analysis.

An ED or engineering/salvage officer is most useful within approximately the first six hours after a casualty—so he has to be located in the battle group as a permanent part of the SART.

The ED community should support an ED in every SART. If this level of coverage is not presently possible, the ED community should be expanded until it is possible.

Special Operations (1140 Designator) salvage officers should be retained as ship-drivers with salvage experience, like LCDR Kemp Skudin, who was of major import in DESERT STORM/SHIELD. If the 1140s go away, MSC crews would be hard-pressed to deal with casualties in a 4400-compartment ship, vice approximately 40 in MSC vessels.

Limitations of all-MSC salvage vessel crew:

- Could not instantaneously interface with a USN ship's crew.
- Have no standard USN damage control training.
- No IC communications experience.
- No secure USN/commercial communications; bridge-to-bridge only. INMARSAT of little practical use in wartime—too congested.

**DESERT SHIELD/STORM PROBLEM:** No portable, secure comms system in-theater. Salvage took a back seat in priority to all other programs. If it was not brought in-theater, it could not be procured there.

There needs to be a dedicated USN SALVAGE COMMS net; problems with INMARSAT from USN perspective:

- Not secure.
- No guaranteed access. ("restricted access" existed because of the volume of traffic.).

These capabilities need to be on-line at all times, resident within SART teams:

- Capability to augment ship's own DC team.
- Professional firefighting personnel with specialized equipment.
- Structural/stability advice.

## Interview Report

Interviewee: Mr. Thomas B. Salmon  
Head, Operations and Ocean Engineering Division  
Naval Sea Systems Command  
ATTN: SEA-00C2  
Washington, DC 20362-5101

Interviewer: John Allen  
Jamestown Marine Services, Inc.

Michael Mulcahy  
Jamestown Marine Services, Inc.

Date: 23 May 1991      Duration: 45 min.

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### 1. Background.

During the course of this interview, Mr. Salmon provided thoughtful insight into the salvage planning and interaction of salvage assets as seen from the perspective of the support role played by the Supervisor of Salvage. Based on his salvage operations expertise and awareness of events and circumstances in the Arabian Gulf, Mr. Salmon offered an informed perception of OPERATION DESERT STORM/DESERT SHIELD salvage successes, problems and opportunities.

### 2. Supervisor of Salvage's Early Efforts to Establish Salvage Capability in the Arabian Gulf.

In the summer of 1990, when it appeared likely that Kuwait would be invaded, but before the US government had escalated its level of involvement in the Arabian Gulf, SUPSALV submitted a number of position papers to NAVCENT, Bahrain, suggesting that the USN mobilize fleet resources—specifically, that:

- The Fleet pre-position salvage vessels in-theater.
- SUPSALV pre-position ESSM gear to support potential salvage operations.

These suggestions initially fell on deaf ears among Arabian Gulf policy-makers. (NAVCENT replied to the offer of ESSM gear, "Thanks, but we don't have a salvage problem—we'll call you if we do.")

In the Sept.-Oct. time frame, Mr. Salmon discussed with LCDR Pruitt, the SIXTHFLEET Salvage Officer, the concept of opening an ESSM facility in Bahrain. LCDR Pruitt supported the idea, recommending it to COMSIXTHFLEET, ADM Nelson. Pruitt envisioned the Bahrain rep as being double-hatted, with maintenance as his primary mission, and salvage a collateral duty. SUPSALV preferred a dedicated salvage type. Regardless of subtle differences of concept, this general support for the idea meant that SUPSALV has found someone at the Fleet level willing to push for USN Arabian Gulf salvage presence.

COMSIXTHFLEET went to Bahrain and briefed ADM Sutton, CMEF, who agreed that a salvage presence was needed. The major issue then became which would be the best command to direct salvage operations. Although SUPSALV's hope was that salvage would be put under an operational command, it eventually was made the responsibility of the logistics command NAVLOGSUPFOR, designated as SRUDET Bahrain, or CTF 151.12. Its placement here reflected the image of salvage among the DESERT SHIELD/DESERT STORM high command—to the extent that salvage was recognized as a requirement at all—as a subset of Fleet logistics and maintenance activities, rather than as an operational force.

### **3. SUPSALV's Agreement With the Dutch Government to Fund a Part of the Salvage Effort in Operation DESERT SHIELD/DESERT STORM.**

In the fall of 1990, Mr. Jack Sullivan, SMIT International's U.S. representative, told Mr. Salmon that the Dutch Government wanted to defray part of the cost of the war's ship salvage effort, but was uncertain of how to proceed. Mr. Salmon, concerned that SUPSALV would never see the funding if such a contribution were made to the U.S. General Revenues, proposed that the Dutch fund directly the two SMIT vessels under contract to SUPSALV, and that SUPSALV write a corresponding no-cost delivery order. NAVSEA Contracts agreed, and the Dutch Government made an initial payment of approximately \$1 million to the USN, later augmented by a similar amount. The money was used to fund the cost of the two ships, SMIT NEW YORK and SMIT MADURA, as well as a Sharjah, U.A.E., warehouse arranged by SMIT to house the Navy's ESSM equipment. Once the Dutch funds were exhausted, SUPSALV assumed all salvage expenses.

### **4. Contractual Arrangements Between SUPSALV and SMIT.**

SUPSALV had two concurrent delivery orders with SMIT. Under one, the costs of the two ships, ESSM warehouse and lease of an advanced shipboard firefighting system were covered by the Dutch funds. Under the other, SUPSALV bore all costs for salvage equipment and services, including charter of additional vessels.

### **5. Respective responsibilities of SMIT and GPC, SUPSALV's ESSM Contractor, for ESSM Equipment.**

The extent of SMIT's responsibility for the ESSM gear was to arrange for the Rockwater warehouse facility in Sharjah, U.A.E., and to install certain equipment aboard the chartered vessel BIG ORANGE VII and mobilize the vessel wherever salvage demand required. GPC's ESSM equipment responsibilities included:

- Airlifting from Williamsburg, Va., to Sharjah.
- Warehouse operations.
- Inventorying.
- Shipping/Receiving.
- Maintenance.
- Local transportation and handling between warehouse and M/V BIG ORANGE VII.

### **6. Lessons Learned from the DESERT SHIELD/DESERT STORM operations.**

SUPSALV must do better contingency planning to be in a stronger operational position, so that when the time comes, decisions have already been made, and need only to be implemented. If the critical decisions are made in advance, life is much simpler in a war. Contingency plans should be developed early and reviewed periodically.

Salvage must be written into OPLANS.

SUPRONS need to interface more aggressively with their fleet counterparts to identify salvage as a valid need before the shooting starts.

The Fleet did not see the broad mission of salvage, but saw it rather as a narrow cleanup function after battle damage has been sustained.

SUPSALV, Mr. Salmon and a SUPSALV naval architect, along with SIXTH/SEVENTHFLEET salvage officers, probably should have visited NAVCENT on day one to outline SUPSALV and Fleet salvage forces' ability to react to a range of combat salvage needs. Purpose: to project salvage requirements, available assets, and shortfalls in capability.

There are still interagency problems regarding cost reimbursement for salvage. If DOD made SECNAV responsible for all ocean salvage, and made a dedicated budget available for this purpose, the problem would be solved.

SUPSALV will hold an in-house debrief of personnel involved in DESERT SHIELD/DESERT STORM, to determine what actions SUPSALV should take to properly position itself for the next war.

## **7. Contingency Planning Requirements.**

Planners at the Fleet level should define several combat salvage scenarios, selecting in the field the one that best fits the actual situation. A Force Salvage Officer (COMMODORE, CAPT or CDR) should be designated by the cognizant FLEETCOM. SUPSALV should send a naval architect to oversee in-theater casualty response, providing ship strength and stability expertise.

## **8. Wartime Contract Administration.**

There is no need for an on-scene COTR. SUPSALV headquarters can respond appropriately to requests for funding approval. The on-site SUPSALV representative can authorize additional contractor assets to do the job, but CANNOT:

- Increase scope of work.
- Obligate SUPSALV to pay for work or asset charter unless funding is in place UP FRONT.

## **9. Funding.**

Funding could be "invisible" to field commanders in the future if SUPSALV could secure contingency funding from potential "customers" among other agencies. This way no time would be lost sorting out who pays when an emergency arises. A problem arises when one agency is asked to fund another agency's project—e.g., would SUPSALV be willing to fund a USAF salvage job? No—just as the USAF would not provide free transportation of ESSM gear.

Money for contracted salvage activities has to come from somewhere. Although the Navy can direct Fleet organic assets without financial considerations being obvious, SUPSALV cannot direct a contractor to do work for which the funding is not already in place. Committing to work under a "promise to pay" arrangement is illegal. When NAVCENT, ADM Arthur, wanted a cruise missile recovered, SUPSALV requested funding. This was proper, since SUPSALV was mobilizing contractors from the DC area and Fla., and flying equipment commercially, at substantial cost.

All required SUPSALV funding was in place, with millions of dollars put on the SMIT contract. When the PRINCETON and TRIPOLI hit the mines, funding, personnel, tugs and equipment were ready to go.

## **10. What Went Very Well?**

Day-to-day operations. When any of our resources were needed (e.g., ESSM, SMIT NEW YORK, SMIT MADURA), they were instantly available and fully operational at all times.

## Interview Record

Interviewee: CAPT Patrick Shepherd  
Commander, Destroyer Squadron Six  
FPO Miami 34099-4709

Interviewers: John Allen  
Jamestown Marine Services, Inc.

Michael Mulcahy  
Jamestown Marine Services, Inc.

Date: 3 May 1991    Duration: 2 Hours

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During the course of this interview, Commodore Shepherd provided thoughtful insight into the salvage events in the Gulf War based on his experiences as Commander, Ship Repair Unit Detachment (SRUDET) Bahrain/CTG 151.12. From his maintenance and battle damage repair perspective as a Surface Warfare Officer with experience as a destroyer squadron Commander, previous ship commands, including a tender, COMSECONDFLT Operations, and COMLOGRU TWO Chief of Staff for Operations, he offers an interesting assessment of the salvage problems and opportunities that OPERATION DESERT STORM presented. The following writeup captures the highlights of the interview session.

CAPT Shepherd was hand-picked for his temporary assignment as Commanding Officer, SRU Bahrain, based on his seniority, previous command of a tender and knowledge of ship maintenance and repair and fleet operations. Approximately a third of his DESRON SIX ships were deployed in the Arabian Gulf. Key dates of his involvement were:

- 28 December 1990 Notified of his temporary assignment as CO, SRU Bahrain
- 06 January 1991 Arrived Bahrain and assumed command of SRU Bahrain
- 17 January 1991 Designated CTG 151.12 and tasked with Salvage coordination
- 12 April 1991 Released from temporary assignment as CO, SRU Bahrain and departed Bahrain

### 1. The Genesis of the Salvage Connection with CTG 151.12.

Prior to CAPT Shepherd's arrival, SRU Bahrain was A four-person detachment of SRU Naples under the operational control of CTF 63, with a Lieutenant Commander as OIC, a civilian ship surveyor, a combat systems CPO and a secretary. With the buildup of naval ships in the Arabian Gulf SRU Detachment was augmented and eventually grew to 12 officers, five of these were divers and over 100 enlisted and civilian personnel. SRU, in addition to maintenance duties, reported to COMIDEASTFOR as CTG 151.12 for Towing, Salvage and Battle Damage Repairs, and to COMNAVLOGSUPFOR for Port Recovery Assessment Operations in Kuwait as CTU 151.6.1.

With the USNS HIGGINS grounding on 2 January 1991, Fleet Salvage responsibility was assigned, by default, under the operational control of the Amphibious Force—CTF 156—even though salvage does not fall under any particular tactical warfare group and CTF 156 did not have any salvage expertise on his staff. The HIGGINS incident and the fact that SRUDET Bahrain was responsible for getting the ship into drydock for inspection, repair and maintenance led to the transfer of Salvage mission and functions to SRUDET Bahrain/CTG 151.12.

## **2. Scope of CTG 151.12 Mission and Salvage Assets In-Theater.**

There was a peak population of approximately 240 ships in the Gulf, and SRU also performed maintenance on other coalition force ships including British, French, Saudi, and Kuwaiti ships as well as MSC-owned and -chartered ships.

The Salvage presence in the Gulf consisted of USS BEAUFORT (ATS 2), over 240 tons of ESSM equipment, five Navy salvage officers, NAVSEA-contracted SMIT-TAK salvage tugs, several other salvage vessels under SMIT subcontract, and U.S. Army divers, support craft and equipment. It was through the COMUSNAVLOGSUPFOR staff that CAPT Shepherd became aware of the presence of ESSM equipment warehoused in Sharjah, U.A.E., and located the salvage officers in the area.

The Navy salvage officers assigned to CTG 151.12 spent most of their time and effort acting as COTRs, working in the Bahrain office and using land-line and INMARSAT telephones to communicate with and coordinate SMIT-TAK and BEAUFORT operations. Because there were no U.S. Navy salvage assets in theater the SALVORS worked out of Bahrain, where they could manage the civilian assets and assist other staffs with planning and requests for salvage assistance, such as Harbor Clearance and downed aircraft recovery.

With these available assets, CTG 151.12 could handle only one salvage task at a time. Had there been an amphibious assault, the one Navy salvage ship asset would have covered only one assault sea lane at a time.

The SMIT ships went virtually anywhere they were tasked. They were partially funded by the Dutch government and felt it was a war effort rather than a simple contract. In contrast other civilian craft were very reluctant to work north of Bahrain. War bonuses, in many cases doubling the cost of normal hire rates were required for vessels including harbor tugs and other utility craft.

During OPERATION DESERT SHIELD/STORM, the only Navy salvage and towing ship assets other than USS BEAUFORT that appeared to be supporting the effort were in Rota and Naples and for a brief time in the vicinity of the Mediterranean entrance of the Suez Canal. They were positioned for assisting ships transiting the SLOC and particularly the MSC-owned and chartered sealift ships. These ships were not assigned to CTF 151.

## **3. Organizational Relationships and Effectiveness.**

The organizational and working relationship involving the Fleet/SRU, NAVSEASYSKOM and SMIT worked satisfactorily but would not be subscribed to in the future. The contracts were run basically out of Washington, DC, and were managed under normal working relationships between NAVSEA and SMIT-TAK and within the SMIT organization as expected in a peacetime, world-wide salvage contract. They did not understand that this was a Fleet environment and that the Fleet communications and plans could not be properly handled in that commercial contract business mode. The SMIT-TAK area representative was operating out of Dubai and talking directly to NAVSEA about the future movement of the fleet; whether or not there was going to be an amphibious operation, etc. Both Washington and the SMIT representative had nothing to do with such fleet matters and yet they were involved and communicated details of the operation.

The command, control and communications (C<sup>3</sup>) in this joint operation emanated from CINCCENT to NAVCENTCOM to COMIDEASTFOR, etc. This joint military command and control within theater enabled tactical surprise and deception directed at Iraq. The Salvage line of communication by commercial land line and INMARSAT both in and around the Gulf theater and direct to Washington coupled with the civilian salvage contract, placed salvage outside the theater military C<sup>3</sup>. Salvage was the only service that was contracted through an outside (i.e., NAVSEA) contracting agency. Everything else needed was available but came through a recognized Fleet channel. MSC, for example, did a lot of contracting but as far as the Fleet Commander was concerned, he dealt directly with COMSC. The MSC Area Coordinator was essentially part of the fleet and had a military command organization. The idea that every salvage task had to first be approved and signed as a contract task order was abhorrent to everyone in the Fleet. You cannot build a civilian operation into a military

organization in the middle of a war. Civilian salvage support during the Iran-Iraq War, in which commercial tankers were the object of salvage and few U.S. ships were in the Arabian Gulf, was attempted again. The commercial needs, organization, response, and compensation were entirely different from the military needs in OPERATION DESERT SHIELD/STORM.

Communications security was at risk with heavy reliance on unsecured telephone lines and INMARSAT. USS BEAUFORT could communicate by secure voice to fleet units and staffs but had to use INMARSAT to talk to salvage officers, SRU headquarters, and occasionally to NAVSEA (00C) directly.

#### **4. Location of the ESSM Base in Sharjah.**

The ease of managing the ESSM at the Sharjah facility, SMIT's ready access to the equipment and the short distances involved (i.e., Sharjah to Bahrain) made it a suitable and convenient location. As things progressed, there was a need for small pumps and generators positioned in Bahrain for the BDAT teams that would deploy by helo from Bahrain to the casualty ships.

#### **5. Salvage Assets Considered Necessary for OPERATION DESERT STORM.**

As SRU and Salvage Coordinator, CAPT Shepherd wanted as a minimum:

- An adequate staff whether ashore or afloat.
- SATCOM radio communications capability.
- An experienced senior fleet salvage officer from COMSUPPRON EIGHT or FIVE.
- A minimum of two Navy salvage ships operating out of Bahrain with one salvage ship and one tender deployed as far forward as possible.
- OPCON of all three tenders that were present so that, as SRU/Salvage Coordinator, he would have been well equipped to coordinate battle damage assistance and battle damage repair.

The forward-deployed tender and salvage ship could be positioned in a "safe box" performing maintenance on ships in the area and ready to respond to casualty assistance. In the instance of a noncombat casualty such as USNS HIGGINS, a salvage assessment team could have been deployed to scope the job, followed by commercial salvage ship.

When asked about the requirement for Mobile Diving & Salvage Unit (MDSU) teams, CAPT Shepherd felt that most of the Fleet was unaware of what a MDSU did and even if they were familiar with the MDSU mission capability, nothing had happened that required a MDSU.

#### **6. The Fleet's View of Salvage.**

When the Naval presence in the Gulf started forming up there was no stated or planned requirement for salvage assets in the Gulf. The services planned for what was needed to do the job and generated the Transportation Priority Force Deployment Data (TPFDD). The Navy's planned requirements did not include salvage ships, MDSU teams or ESSM gear. In the middle of a conflict, the Battle Group Commander does not appreciate being told that he has an important need for salvage forces that includes several salvage ships, forty MDSU personnel and 17 C-140 loads (240 tons) of ESSM equipment.

This should all have been in the deployment plan and been brought forward with the rest of the force.

From CAPT Shepherd's perspective, the 1140 officer community and the Navy diving community have specialized themselves out of business. They have a confusing and segmented mission that is poorly understood by much of the Surface Warfare community. Salvage and EOD seem to have very little or nothing in common, in sharp contrast to the versatility of the French and British clearance divers.

Salvage does not have the awareness or the respect of the modern Naval Fleet since salvors and salvage assets are not out steaming and operating with the Fleet. Salvage is not visible in modern naval or joint warfare doctrine.

The need for specialized salvage ships is apparent only in amphibious operations support requiring beach gear, etc., for extraction of ships and craft.

## **7. General comments on Salvage and Battle Damage Repair (BDR).**

In the mind of the Battle Group Commander, there is a conceptual problem of linking Salvage with BDR. When a ship is put in the hands of the salvors, the Battle Group Commander considers the ship a liability rather than an asset. If you are doing salvage, you can not be doing battle damage repair. Salvors patch holes in the hull and pump water out to stabilize a ship but this is not repair. Battle damage repair means that you do the repair and the ship keeps fighting. The initial triage to a damaged ship is a repair function and not a salvage function. It involves battle damage assessment and essentially three degrees of damage problems:

- Minor damage that can be repaired in place with assistance from a repair team from a repair ship. Involves repair triage in which cables, piping and valves are repaired or replaced, allowing the ship to continue to fight.
- Major damage that disables the ship's offensive fighting capability, steering or propulsion. Once stabilized, the ship must proceed under her own power or under tow to the nearest repair facility that can make the necessary long range repairs. In an area like the Arabian Gulf there are enough towing assets within reasonable distance and time to provide towing assistance. In places not like the confined area of the Arabian Gulf, another Navy ship in the Battle Group would do the towing.
- Major damage to the extent that the ship cannot be saved and effort is directed at getting the crew off safely and stabilizing the ship long enough to remove high value cargo such as Tomahawk missiles and electronics equipment. This requires an assist ship that has heavy lift capability using cranes with heavy cargo nets and capable of operating in the open ocean.

If the salvage community is trying to expand their mission by being the at-sea firefighters, waterborne Red Adairs, it is difficult to see that concept going anywhere. The SART concept must first be legitimized as a fleet requirement—something that the fleet absolutely needs. That is not and has not been the case. At the present time, Salvage is not part of the Fleet Commander's organization. The salvage mission and hierarchy of functions must be a clearly defined Fleet requirement in the eyes of the Fleet tactical planners and trainers, namely Second and Third Fleets.

Naval ships are designed and manned to have on-ship firefighting capability. When a naval ship in a battle group needs assistance, another ship in the group would normally respond with a Rescue and Assistance Team. In the case of merchant ships manned with small crews and not much firefighting capability, there is a need for salvage tugs with off-ship firefighting capability to assist these ships. MSC-owned and chartered ships would fall into this category. CAPT Shepherd's tender once provided off-ship assistance to an oiler on fire in the middle of the Atlantic Ocean, shuttling assist teams with equipment to and from the distressed ship. In March 1991, two U.S. Navy ships and one British Navy ship provided off-ship firefighting assistance to a merchant in the Arabian Gulf, putting a fire out and the British ship took the vessel in tow.

A tender or repair ship such as the AR(X) planned for construction is a good platform for advance basing of the Force Salvage Officer/Coordinator, salvage teams and their equipment. A force deployment would include a Battle Repair ship. If the fleet is involved in an area of crisis or conflict, the BDR tender will be close by and not several hundred miles away. This was demonstrated 18 months ago when a Task Force deployed off the coast of Lebanon and a BDR tender serviced the fleet units. Some ships were fendered alongside with power plants cold iron but all weapon systems on line with tender-supplied power for as many as five days while the tender steamed ahead slowly. The design of the AR(X) should include an astern towing capability and a capacity for the additional firefighting equipment and ESSM gear. The ship should be equipped with a flightdeck and associated elevators and cranes to handle aircraft and loads of the CH-53 variety. A capable Combat Systems Repair capability should also be essential.

## Written Response Report

Respondent: LCDR Kemp Skudin, USN (1140)  
Commanding Officer  
USS BEAUFORT (ATS 2)  
FPO San Francisco, CA 96601-3218

Date: 8 May 1991

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### Background.

As Commanding Officer of USS BEAUFORT (ATS 2), homeported in Sasebo, Japan, Lieutenant Commander Kemp Skudin was under the operational control of Commander Surface Support Group Western Pacific/CTF-73. He deployed to the Arabian Gulf in early January 1991 and in-chopped to Commander, Middle East Force on 29 January. USS BEAUFORT provided salvage, towing, search & recovery, and other miscellaneous services in the Arabian Gulf until released for redeployment in early June. In his written responses to the interview letter, LCDR Skudin provided thoughtful insight, based on his first-hand experiences in the Gulf Theater. With his broad knowledge of and experience in operational salvage and diving he offered a special perspective of OPERATION DESERT STORM salvage events, problems, opportunities and lessons learned. He provides the following written response to interview questions.

**1. In what capacity, and to what extent, were you involved with salvage forces deployment and operations during OPERATION DESERT SHIELD and DESERT STORM? Did the purpose or agenda for your involvement change over time?**

I was involved with salvage force deployment during Desert Shield and Desert Storm as the Commanding Officer, USS BEAUFORT (ATS 2), the only "gray hulled" salvage ship deployed to the Middle East for the war. From August 1990 I had requested and strongly lobbied to join the Middle East Forces. Despite the support of COMNAVSURFGRU WESTPAC, COMUSNAVCENT did not approve the deployment until December 1990 for a 3 January 1991 departure date from Sasebo, JA. Commander Middle East Forces was unsure how to position us but our input was followed; that is, travel north with the Amphibious Advance Force, remaining as close to the action as possible while remaining under the protection of the gunships against the Iraqi air/missile threat. Throughout the war the staffs we worked for did not fully understand our capabilities and required our input to use us to best advantage. While EOD was represented on the various afloat staffs the only salvage expertise other than Beaufort was ashore. The key to success was communicating with the staffs after monitoring circuits and advising them of our capabilities appropriately. SRU det Bahrain was effective and in constant communications but often, especially during battle damage scenarios, Beaufort was involved before anyone ashore knew what was happening, since we were fully integrated with the battle group. Assistance to USS TRIPOLI and USS PRINCETON, for example began immediately, based on voice circuit monitoring. Intentions were stated and permission requested for BEAUFORT's actions while they were occurring, not subsequent to tasking by higher authority. As in World War II and Korea the USN salvage ship provided the Battle Group Commander with an immediate asset for emergent battle damage triage, usable only by virtue of immediate accessibility and battle group integration.

**2. In your opinion, what were the two or three major problems encountered with regard to the deployment of salvage forces and equipment in the Mid-East region of conflict?**

The single greatest problem was the lack of salvage expertise available to major afloat staffs. On USS BEAUFORT, because of our gray hulled status and communication connectivity, we provided advice and assistance to afloat staffs but were ineffective compared to what an in house salvage staffer could have done. Likewise, salvage assists and personnel ashore were out of sight and too often out of mind due to lack of representation on afloat staffs.

The second problem was that civilian afloat salvage assets like SMIT NEW YORK were restricted from the war. None were allowed North of 27 degrees 30 minutes north without protection and hence, were not available to the battle force commander for emergent tasking in a timely fashion.

**3. In your opinion, what were the best two or three features of our salvage force presence in the Gulf?**

The best features of our salvage presence in the gulf were:

- a. USS Beaufort's immediate accessibility.
- b. The infrastructure set up ashore under SRU which was, however, not well-known to the over-worked afloat staffs.

**4. Was the Navy prepared with a concept of operations or plan for dealing with:**

- \* Firefighting contingencies
- \* Vessel towing
- \* Battle damage assessment
- \* Emergency ship repairs?

Concepts of operation were a dime a dozen throughout the war. The concepts stood up were usable and effective if and when they were available and understood by the staffs needing them. Without a salvor on staff the main problem was getting the concept staffed.

**5. How would you characterize the salvage organizational infrastructure and interface with USNAVCENTCOM? COMNAVLOGSUPFOR? COMMIDEASTFOR? SIXTHFLT?**

The salvage organizational infrastructure needed a home. Until it was give a task designator under COMMIDEASTFOR (151.12), it existed in an information vacuum. Even afterwards, without a salvage staffer on COMMIDEASTFOR for USNAVCENT staffs, it was not well-understood.

**6. Was the presence of ESSM equipment adequate? If not, what type, quantity, deployment, and positioning of ESSM gear would you recommend?**

Apparently the ESSM gear/positioning worked for this war. It was enough for what happened. Was it enough for what might have happened? Tough question.

**7. How effective was the active Navy and contractor salvage interface in providing a "salvage system" presence?**

Active Navy and contractor interface was ineffective in providing a "salvage system" presence because:

- a. Major Staffs involved could not authorize the expenditure of funds directly.
- b. Salvage personnel were not represented on afloat staffs.
- c. Use of commercial assets in the war zone was inordinately expensive for contracting on a contingency basis and would not have been timely otherwise.

**8. In your opinion, would the Navy be well served by a continuing, long-term presence in the Gulf region? What composition? What organizational infrastructure?**

Long term presence in the gulf is not worthwhile unless there is representation directly on COMMIDEASTFOR staff, and/or it consists of a gray hull fully integrated into theater forces. If the Commander (CMEF) knows and can use what he'd got (i.e., has a salvage officer on staff) recommend.

- a. An ARS/ATS.
- b. A "ready" ESSM base.
- c. An ashore Battle Damage Repair (BDR) crew (with a salvage officer assigned) in Bahrain. Integrated into Ship Repair Unit (SRU).
- d. Contracting authority (but not necessarily pre-negotiated retainer contracts) to rent heavy lift/tug assets. Paying to put these on retainer would be wasting money since there are so many assets available locally, due to the offshore oil industry.

**9. Was there a role for NDSU/RMDSU personnel? If yes, how many?**

MDSU/RMDSU personnel? Why not let them provide staffing support and a ready team either local or ready to fly? Numbers:

- a. One on CMEF staff.
- b. Dive/chamber team in Bahrain.

**10. If the Salvage Assistance Response Team (SART) concept were fully up and running, how would have deploy the SART in the Gulf War?**

No opinion.

**11. What could have been done to improve salvage presence afloat and ashore?**

A salvage czar ashore integrated with the BDR forces, a salvage officer on CMEF staff, and at least two salvage ships in theater, one mixed gas capable.

**12. What should the Navy's salvage role be, if any, in the post-war reconstruction?**

Navy's salvage role post-war ought to be dictated by the State Department.

**13. If you were "king", what two or three changes would you implement that, in retrospect, would have made the Navy salvage forces more effective in support of OPERATION DESERT SHIELD and DESERT STORM?**

If I were king:

- a. Salvage officer on CMEF staff.
- b. Salvage unit in Bahrain who is double hated under the theater BDR officer (SRU CO).
- c. Two salvage ships on station during the "hot" war. One working and one waiting/available.
- d. Salvage "czar" with budget/contracting authority restorative to and controlled by CMEF, without requirement to go through NAVSEA.

## USS BEAUFORT Chronology

- 29 Jan Chopped to CMEF, condition III steaming.
- 30 Jan Transited straits of Hormuz, "Confrontation" with Iranian Auxiliary "Duroo" near straits entrance.
- 31 Jan - 9 Feb Moored Abu Dhabi in threatcon Delta.
- 10 Feb Underway to join Amphibious Advance Group.
- 13 Feb Underway collision damage assessment of USS KANSAS CITY (hole in one fuel tank) in heavy seas at anchor. Joined Amphibious Advance Force (approximately 40 coalition ships) headed north.
- 15 Feb On station Northern Arabian Gulf awaiting action with other auxiliaries in Dora Oilfield "holding box."
- 16-17 Feb On station. Came alongside British ship RFA DILIGENCE and made up fittings for US/British firemain. Discussed salvage/options/coordination.
- 18 Feb At 0503C overheard TRIPOLI mine strike reports on voice circuits. Proceeded directly to TRIPOLI. Helo'd salvage officer and MDV ahead. Laid off TRIPOLI at 0708, having overheard PRINCETON's mine strike report, proceeded to her location. Within first few minutes after departure spotted moored mine below water and 6 feet off port bow. Maneuvered away and marked/reported mine. AVENGER reported on bridge to bridge we had entered a mine line that she (Avenger) held on sonar. Backed out and then came ahead through mineline on instructions from AVENGER on bridge to bridge radio. Fell in behind ADROIT for 10 miles (approximately), transit to PRINCETON. Maneuvering for scores of mine like contacts made trip last until 1219C. At 2,000 yards from PRINCETON sent dive team in by rubber boat to get started (Master Diver and Salvage Officer had been helo'd to PRINCETON from TRIPOLI). Dive team's boat ran directly over another moored mine and marked it with a smoke float so ship could avoid. Did underwater damage assessment of PRINCETON and took her in tow just before dusk. Maneuvered her behind Adroit making abrupt turns, some over 90 degrees, to avoid mine like contacts until out of the minefields at about dawn. NOTE: Timely tow was significant in that if weather had been bad Princeton would have probably lost her stern section. South East winter storms were coming every few days and we wanted to get her out and beat the next storm. As it was she had to be taken to Bahrain vice Dubai when heavy weather hit on the way south.
- 19 Feb 1600C Turned Princeton over to tug SMIT NEW YORK and headed north again.
- 20 Feb Joined auxiliary group in Dura Field holding box. Hit by severe storm and ordered to proceed to TRIPOLI as heavy seas caused her flooding boundaries to pant and failure was possible. Helo'd 1st Lieutenant in TRIPOLI.
- 21 Feb 0200 Anchored 1,000 yards from Tripoli, seas abating. Tripoli rigged to be towed stern first.

22-23 Feb Seas down. Performed hull survey and video of TRIPOLI hull damage. Cracks promulgating aft from hole towards flooding boundary in danger of growing as metal works in seaway (moving visibly). Used Kerie Cable to burn two stop crack holes. Left at 1800, 23 February escorting TRIPOLI south at 5 knots, (her own power) rigged to take her in tow stern first if necessary. Avenger leading out, mine hunting.

24 Feb Turned over TRIPOLI escort/emergency tow duties to tug SMIT NEW YORK at 27 degrees 30 minutes north and headed back to Northern Gulf at 2200C.

25 Feb Enroute north conducted small boat transfer/limited reprovision with USS KALAMAZOO at 0315C. Anchored east of Sirius oil field in northern gulf at 1615C in company with numerous other ships. Awaiting tasking.

26 Feb-1 Mar Anchored as above.

2 Mar Transited south for reprovisioning at dusk.

3 Mar Vertrep 17 pallets from USS NIAGARA FALLS and alongside refuel 40,000 gallons from USNS PASSUMPSIC. Recovered "Rubber Duck" decoy in casing dropped during vertrep of USS VALLEY FORGE. Upon completion headed north and came to anchor.

4 Mar Transited swept channel to "BBFSA" area off Kuwait and anchored near USS LASALLE and USS New ORLEANS. Visited CMEF staff on New ORLEANS.

5 Mar Heavy Southeast storm. Needed both anchors.

6 Mar Anchored as above.

7 Mar Helo'd Master Diver and one diver with 3 inch pump to assist in minor salvage work ashore at Ash Shuaibah, Kuwait.

8 Mar Master Diver and diver return.

9 Mar Helo'd dive team to USS CARON to inspect suspected leaking CPP. At 1630C led the civilian tug SCORPIO with self-propelled mine sweeping boat down swept channel to port of Ash Shuaibah. Anchored out (1,800 yards off) at 1900C.

10 Mar 0630 Went to Ash Shuaibah by boat to conduct liaison with salvage forces and deliver some line needed by them. 0900 weighed anchor and lead civilian tug BIG ORANGE VII out swept channel. Proceeded to flight recorder box recovery of downed C-130 off Khafji.

11 Mar Anchored about 4 miles off the beach north of Khafji. Closest we could get. Boat sent in with divers to find C-130 marked by Air Force helo. Found C-130 and picked up Air Force liaison officer but could not dive after 1600 due to heavy weather (surf) in area (8 FSW).

12 Mar Weather abated. Recovered the C-130 flight recorder box from the debris field. Discovered floating mine and destroyed with embarked (for C-130 tasking) EOD using ships salvage demolitions. 1600C commenced transit to Bahrain.

14 Mar 1400 Pier side Bahrain. Loaded side scan/ROV for helo and ordnance recovery operations.

17 Mar Underway for SH-60 helo recovery.

18 Mar On site 0700. Located pinger with receiver by boat. Laid 2 point moor and hooked up to helo in 90 FSW with scuba divers. Helo on deck in one piece at 1900. Unbolted center section of towbow and removed to get it on in one piece. Left for Bahrain to offload.

20 Mar Offloaded SH-60 with ships crane in Bahrain.

22 Mar Underway 1630C for TLAM recovery operations.

22 Mar-7 Apr Successfull TLAM recovery operations. Laid 17 precision 2 point moors and recovered 3 missiles in heavy current in 180 - 230 FSW. Side scan/ROV essential to success as was acoustic positioning system. We returned to port for the system after being unable to track ROV relative to ship in heavy currents. One item required deep air diving and two required mixed gas diving.

8-10 Apr Offload in port Bahrain.

11 Apr Underway for Dubai on short (1 day) notice to deliver LM 2500 change out kit to USS PRINCETON who had lost one main engine during testing.

12 Apr Delivered LM 2500 engine and vans at Dry Dock basin. Proceeded to port visit at Mina Rashid, Dubai.

13-17 Apr In port Dubai.

18 Apr Enroute Bahrain.

19 Apr Reprovision Bahrain.

20 Apr Enroute Kuwait City for port opening ceremony.

21 Apr Transited swept channel. Planning meeting on board USS KIDD for ceremony.

22 Apr Participated in Kuwait City ceremony in company with numerous multi-national ships (via swept channels).

23 Apr Transit to Bahrain (via swept channel when north).

24 Apr In port Bahrain for TAV with USS CAPE COD.

1-31 May Various operations, logistics services, etc.

1 Jun Underway for transit back to Sasebo, Japan

2 Jun Outchop COMIDEASTFOR

## Salvage in A Battle Group Environment

An essential prerequisite to Beaufort's operations in the Operation Desert shield was our ability to integrate with a rapidly changing battle group organization. Our TACCOM was changed sometimes on a daily basis, dependent on tasking. We were often "forgotten," in placement and organization and, like many others, in daily OPSUMS we proceeded our next day's intentions with a "unodir " and did what we thought best. When casualties occurred we, like all ships, responded immediately, informing OTC on voice circuits without awaiting tasking. This hectic and changing environment produced the following requirements:

- A. Battle group commander's staffs are not well versed in salvage ships capabilities. OPGENS should contain plain language listings of all capabilities and salvage gear on board. In addition, a complete list of capabilities in salvage, diving, weapons, communications, fuel consumption, towing etc. should be mailed several months before inchoption.
- B. Radio required a minimum of three watchstanders to keep up with voice and teletype circuits.
- C. Battle orders need to be very specific with regard to weapons and communications status. Pre-fires, ammunition to the tray, what circuits are where, etc.
- D. The bridge required an OOD, JOOD, radar watch, tactical communicator and a log keeper for tactical circuits and status board updates. This is in addition to the normal helm, lookout, QMOW and RMOW. This is a minimum requirement.
- E. Condition III steaming required 1/2 guns manned and very explicit battle orders with regard to the rules of engagement. The manning is a strain on the watchbill especially since, as the situation often required, the petty officers manning the guns were given weapons release authority to minimize reaction time. This required good, responsible, well-trained people.
- F. Be ready for short notice alongside replenishment and daily short notice vertreps. This later requires thought as to what you want on the fantail at any given time and how it is to be secured. Be ready to come alongside ships at sea and have good fenders.
- G. Check your boats and, Z boats (have at least two). Bring plenty of welding and cutting consumables.
- H. Listen to all circuits and have watchstanders spring loaded to pass information regarding any possible salvage, rescue, tow or casualty. It will give you the edge you need to get ready and get going in a timely fashion which is as soon as they need you, but often before the OTC has figured out how you can help him. In a battle group environment you will often not be tasked as promptly and completely as you need to be. You have to make up the difference by preparation and anticipation.
- I. Hold daily (mid day was best for us) intelligence and battle orders briefings/conferences for all essential condition III watchstanders.

All in all, the salvage we did in the gulf was constant but not especially complex or remarkable. What truly tested our ability and is worthy of your planning and consideration is how to prepare present and future salvage ships to integrate into and be effective in a battle group environment. As you can see from the above, the complete integration and hence responsiveness of the salvage unit requires attention to all aspects of our sea going mission and severely tasks our individual ship manning, training and logistics. In addition, I do not believe the responsiveness and communications connectivity required by a battle group commander in a hot war environment is possible with a contract, or even a MDSU augmented MSC salvage ship.

## **Interview Report**

**Interviewee:** John L. Sullivan, Jr.  
Chairman  
SMIT International (Americas) Inc.  
301 Route 17 North  
Suite 800  
Rutherford, NJ 07070

**Interviewer:** John Allen  
Jamestown Marine Services, Inc.

Michael Mulcahy  
Jamestown Marine Services, Inc.

**Date:** 7 May 1991    **Duration:** 45 minutes

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### **1. Background.**

During the course of this interview, Mr. Sullivan provided thoughtful insight into the salvage planning and interaction of salvage assets as seen from the perspective of the support role played by the Supervisor of Salvage (SUPSALV) Western Pacific salvage contractor. Based on his salvage management expertise and awareness of events in the Arabian Gulf, Mr. Sullivan offered an informed perception of OPERATION DESERT STORM/DESERT SHIELD salvage successes, problems and opportunities. He played a liaison role in planning and expediting a contribution of nearly \$2 million by the Dutch Government to defray part of SUPSALV's salvage costs in Operation Desert Shield/Desert Storm.

### **2. Events leading up to the Dutch Government's contribution for salvage in the war.**

In the early days of Operation Desert Shield SUPSALV was concerned at USN operational commanders' lack of recognition that salvage was a requirement in overall naval combat readiness. SUPSALV inquired about SMIT's capability to provide shoreside salvage support in the Arabian Gulf and associated equipment rates, but took no further action at that time.

A casual conversation in the fall of 1990 between Mr. Sullivan and Mr. Tom Salmon of SUPSALV led directly to the Dutch Government's financial contribution to Operation Desert Shield/Desert Storm. Working through the SMIT organization and its contacts in the Dutch Foreign Affairs Department, Mr. Sullivan pursued Mr. Salmon's suggestion that the Dutch consider some financial assistance to SUPSALV in the war effort.

In late November, 1990, a meeting was convened in the OOC offices in Washington. Attending were key SUPSALV personnel, including counsel; Mr. Sullivan; Mr. Klaas Reinegert, Managing Director of SMIT-TAK; and a representative from the Dutch Foreign Affairs Department. A contractual mechanism was formulated to allow SUPSALV to accept the Dutch contribution, an unusual transaction in Navy contracting. With the proviso that SMIT would draw directly against the Dutch funds in payment for ship salvage services, Mr. Reinegert set SMIT rates for the project, and the agreement was signed. The initial payment of approximately \$900,000 was subsequently augmented by a similar amount from the Dutch government.

### **3. ESSM Equipment Warehouse.**

The Navy's ESSM equipment was stored in a Sharjah warehouse owned by Rockwater, a partnership between SMIT and the U.S. company Brown and Root. In addition to the GPC contract personnel who took care of the equipment, SUPSALV's CAPT Steve Delaplane, CDR Bert Marsh and LCDR David Balk worked out of an office in this facility.