DEPARTMENT OF THE NAVY

UNITED STATES ATLANTIC FLEET

HEADQUARTERS OF THE COMMANDER IN CHIEF

NORFOLK, VIRGINIA 23511-6001

5830
Ser N02L6/c008293
30 NOV 1988

[redacted]-Unclassified upon removal of basic correspondence

THIRD ENDORSEMENT on CAPT , USN, B6 '1120
ltr of 25 Jun 88

From: Commander in Chief, U.S. Atlantic Fleet
To: Judge Advocate General (Code 21)

Subj: INVESTIGATION TO INQUIRE INTO THE CIRCUMSTANCES SURROUNDING THE FIRE ON USS BONEFISH (SS 582) WHICH OCCURRED ON 24 APRIL 1988

Encl: (180) COMSUBLANT ltr 5830/006B Ser 006/006749 of 7 Nov 88

1. The findings of fact, opinions and recommendations of the investigating officer, as modified by the first and second endorsers, are approved. Enclosure (180) is a supplemental letter by the second endorser, and the action taken therein is also approved.

2. The failures of fluid systems piping, which released hydraulic fluid, high pressure air and refrigerant-12 (CCL-F) are matters of significant concern. These failures appear to have not only exacerbated the volume and complexity of the fire, but also affected firefighting techniques and life support (Emergency Air Breathing) systems. The evaluations and studies outlined in paragraphs 4, 5, 6, and 8 of the second endorsement should be pursued on a priority basis.

3. By copy of this endorsement, Commander, Naval Sea Systems Command and Commander, Naval Safety Center are requested to ensure technical and procedural lessons learned from studies associated with USS BONEFISH fire are incorporated into training, procedures, system design changes and SHIPALTS as appropriate for all types of U.S. Navy ships and aircraft.

4. By copy of this endorsement, a copy of this investigation is forwarded to Commander in Chief, U.S. Pacific Fleet for potential lessons learned for Pacific Fleet diesel submarines.

5. This tragic casualty and the three lives lost are deeply regretted. The professionalism and, in some cases, heroic actions by the crew of BONEFISH and rescue and support personnel were, without question, responsible for preventing loss of additional

ALL B6

[redacted]

[redacted] -- (Unclassified upon removal of the basic correspondence)

Subj: INVESTIGATION TO INQUIRE INTO THE CIRCUMSTANCES SURROUNDING THE FIRE ON THE USS BONEFISH (SS582) WHICH OCCURRED ON 24 APRIL 1988

6. By copy of this endorsement, COMSUBGRU 6 is directed to: identify all fluid and electrical systems which failed during this event; evaluate the probable contribution of each such failure to the damage sustained by the vessel; and report the results to COMSUBLANT. Required technical assistance should be obtained from COMNAVSEASYSCOM and the Naval Safety Center.

7. COMSUBGRU 6 has completed action on recommendations 3 and 4 of the basic correspondence regarding B6 COMSUBLANT takes all other approved recommendations for action.

8. By copy of this endorsement, COMNAVSEASYSCOM is requested to review the results of this investigation together with the forthcoming report of the study conducted by Naval Safety Center and initiate revisions to procedures, system design changes, and shipalts deemed appropriate.

Copy to:
COMNAVSEASYSCOM
COMSUBGRU 6

ALL B6

DEPARTMENT OF THE NAVY
COMMANDER SUBMARINE FORCE
U.S. ATLANTIC FLEET
NORFOLK, VIRGINIA 23511-6296

5830/006B
Ser 006/ 006740
07 NOV 88

From: Commander Submarine Force, U. S. Atlantic Fleet
To: Commander in Chief, U. S. Atlantic Fleet

Subj: INVESTIGATION TO INQUIRE INTO THE CIRCUMSTANCES SURROUNDING THE FIRE ON USS BONEFISH (SS 582) WHICH OCCURRED ON 24 APR 88

Ref: (a) COMSUBLANT ltr 4700 Ser 006/C 000802 of 16 Aug 88
(b) JAGMAN

1. This command endorsed and forwarded the report of the subject investigation by reference (a). Upon further consideration of the matter, recommendations 3 and 4 of the Investigating Officer's report have been disapproved.

2. The recommendations in question were that nonpunitive letters of caution be issued B6

Paragraph 0111 of reference (b) provides that such letters are corrective measures intended to further command efficiency. In the context of the events of 24 April 1988, the two letters may be interpreted wrongly as placing the primary responsibility on two junior persons for the tragic consequences of a complex series of events occurring over an extended period of time.

3. It is requested that this supplemental action be reflected in the record of the subject investigation.

Copy to:
COMNAVSEASYSCOM
COMSUBGRU 6
COMSUBRON 4

Chief of Staff

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[redacted]

DEPARTMENT OF THE NAVY
COMMANDER SUBMARINE FORCE
U.S. ATLANTIC FLEET
NORFOLK, VIRGINIA 23511-6296

4700
Ser 006/C 000802
1 F AUG 1988

[redacted]

SECOND ENDORSEMENT on Captain [redacted] ltr dtd 25 Jun 88

From: Commander Submarine Force, U. S. Atlantic Fleet
To: Judge Advocate General
Via: Commander in Chief, U. S. Atlantic Fleet

Subj: INVESTIGATION TO INQUIRE INTO THE CIRCUMSTANCES SURROUNDING THE FIRE ON THE USS BONEFISH (SS582) WHICH OCCURRED ON 24 APRIL 1988

Encl: (179) Naval Research Center ltr 3900 Ser 6180-266 dtd 31 May 88

1. Readdressed and forwarded.

2. The findings of fact, opinions and recommendations are approved as modified.

3. Enclosure (179), the report of a paral el investigation by Naval Research Center, raises technical issues which, though not relating to the cause of the fire, tend to explain its severity and the extreme resulting damage. In brief, the report concludes that though the class "C" (electrical) fire flashed to a class "A" (solid combustible) fire due to radiated heat, liquids released by heat failure of the on board hydraulic and refrigerant systems played a role in the damage. Significantly, hydraulic fluid may have fed the fire, F12 from the freon system generated toxic gasses and burning polyvinyl chloride (PVC) insulation and refrigerant 12 (CCl F) contributed to the corrosive atmosphere created. The report also finds that a fire of this intensity would require a supplemental air source which appears to have been derived by the continued operation of fan F4 and the rupture of a compressed air line.

4. COMNAVSEASYSCOM (SEA 56) has conducted an independent evaluation of this casualty and expects to publish a report soon. Review of a draft of that report showed no findings which are inconsistent with the basic correspondence as endorsed.

5. Commander, Naval Safety Center is also conducting a study of the mishap. Discussions with cognizant officials at the Safety Center indicate nothing has yet been identified which is contrary to the findings of the basic correspondence as endorsed.

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Subj: INVESTIGATION TO INQUIRE INTO THE CIRCUMSTANCES SURROUNDING THE FIRE ON THE USS BONEFISH (SS582) WHICH OCCURRED ON 24 APRIL 1988

6. By copy of this endorsement, COMSUBGRU 6 is directed to: identify all fluid and electrical systems which failed during this event; evaluate the probable contribution of each such failure to the damage sustained by the vessel; and report the results to COMSUBLANT. Required technical assistance should be obtained from COMNAVSEASYSCOM and the Naval Safety Center.

7. COMSUBGRU 6 has completed action on recommendations 3 and 4 of the basic correspondence regarding BG COMSUBLANT takes all other approved recommendations for action.

8. By copy of this endorsement, COMNAVSEASYSCOM is requested to review the results of this investigation together with the forthcoming report of the study conducted by Naval Safety Center and initiate revisions to procedures, system design changes, and shipalts deemed appropriate.

Copy to:
COMNAVSEASYSCOM
COMSUBGRU 6

[redacted]

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DEPARTMENT OF THE NAVY
COMMANDER SUBMARINE GROUP SIX
NAVAL BASE
CHARLESTON S C 29408 5000

5830
Ser 003/ 002320
25 JUN 1988

[redacted]--Unclassified upon removal of the basic correspondence

FIRST ENDORSEMENT on CAPT , USN, B6 1120
ltr of 25 JUN 88

From: Commander Submarine Group SIX
To: Judge Advocate General
Via: Commander Submarine Force, U. S. Atlantic Fleet

Subj: INVESTIGATION TO INQUIRE INTO THE CIRCUMSTANCES SURROUNDING THE FIRE ON THE USS BONEFISH (SS 582) WHICH OCCURRED ON 24 APRIL 1988

1. Readdressed and forwarded.

2. The findings of fact are approved.

3. The opinions in the basic letter are approved with the exception of opinion 7. While it is clear there were training and material deficiencies that affected the safety and seaworthiness of USS BONEFISH (SS 582), it is considered CAPT , USN, Commander Submarine Squadron FOUR, was, in fact, as ISIC, heavily involved in actions to improve the ship's material condition and the crew's state of training.

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Additionally, on numerous occasions, operations were cancelled and schedules changed in order to keep USS BONEFISH (SS 582) in port to further pursue corrective maintenance. As early as October 1987 the ISIC identified that the training of personnel on USS BONEFISH (SS 582) in the areas of maintenance and operations was unsatisfactory, and issued a plan of correction that included very heavy supervision by squadron staff personnel. On 11 January 1988, the ISIC issued a program to provide special monitoring of USS BONEFISH (SS 582) material conditions and operational practices. On 23 February 1988, the ISIC commenced a special Crew Certification inspection, similar to those inspections on submarines about to leave overhaul, to ensure that USS BONEFISH (SS 582), on completion of a lengthy in-port maintenance program, was ready for sea in the areas of crew training and proficiency. This inspection was preceded by a prolonged period devoted to training in basic submarine practices. On the basis of these and other similar endeavors, I believe that the ISIC made reasonable and proper efforts to ensure correct operational maintenance practices. Although the ISIC might have done more to improve the ship's material condition, I do not find him culpably negligent.

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4. The recommendations of the basic letter are approved with the following exceptions and additions. With regard to recommendations 1 and 2:

a. B4

b. B4

5. Recommendation 6 concerning provisioning of submarines with sufficient life rafts, is recognized as presenting a stowage problem of enormous dimensions. Most submarine allowances provide for escape appliances for all hands (which have a dual purpose as a life jacket) and two small (7 man) life rafts. The allowance appears to be based on the premise that the equipment would be used in escaping from a submarine downed in salvageable waters and not to escape from a submarine on the surface. Based on the operating patterns of today's submarine force, escape from the surfaced condition seems to be the most likely circumstance. It is therefore recommended the allowance of escape equipment be reviewed with an eye towards increasing the number and capacity of life rafts.

6. B4

7. Following discussions with the investigating officer, the intent of recommendation 5 is amplified. This recommendation addresses deficient maintenance practices on valve TD-22 and the lower engineroom hatch. The intent of review of forcewide quality assurance practices is to discover if, as a result of very heavy emphasis on verbatim compliance with written work procedures, that common sense, and the ability of the individual worker to question the correctness of written documentation has been lost or degraded. The application of common sense and journeyman's experience in maintenance is necessary to identify errors in written procedures, regardless of the thoroughness of documentation review and the level of approval. It is the belief of the investigating officer that some of the ability of the educated maintenance technician to question his procedural documentation has been lost. I recommend commanding officers of Submarine Force units be directed to incorporate into their training programs, a requirement to emphasize the need for maintenance technicians to feel responsible

ALL B6

18. As a result of this tragic casualty, three lives were lost and a submarine damaged beyond economical repair. As in most casualties, there were many contributing factors that, in sum, caused the fire to occur. There were deficiencies in design, maintenance, supervision, training, and personnel management. This is a 25 year old submarine designed less optimally than our newer ships. Not due to anyone's negligence, there have been four commanding officers of the ship in the last three years, five executive officers, and six engineers. Several of these men were

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ut there is no doubt that this personnel turbulence was a principal factor in the lack of supervision of training and maintenance mentioned in the investigation. It is my opinion that none of the above elements can be singled out as the principal cause of the USS BONEFISH (SS 582) fire. Nor can I find any individual to be culpably negligent to such a degree that I consider the imposition of punishment under the Uniform Code of Military Justice appropriate.

>

Copy to:
OJAG (Advance Copy)(Complete)
NAVSAFCEN (Complete)
COMSUBRON FOUR
CAPT

ALL B6

[redacted]

[redacted]

25 June 88

From: Captain , USN, Investigating Officer
To: Commander, Submarine Group SIX

Subj: INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING A FIRE ONBOARD USS BONEFISH (SS 582)

Encl: (1) COMSUBGRU SIX ltr 5830 Ser 003/001382 of 25 Apr 88
(2) Naval Shipyard, Portsmouth, NH Plan SS580-105-1700087 ALTF; SS580 Platform Deck-Lower Level FR 24 to 52
(3) Report, Undated, Investigation of fire on USS BONEFISH (SS 582) From , and of Electric Boat Division, General Dynamics
(4) Photograph of a corroded stuffing tube
(5) Naval Shipyard, Portsmouth, NH, Plan SS580-845-1701317 ALT F; SS580 Crews Quarters Arrangement Sections and Elevations
(6) Ship's material history, January 1979 to March 1988, Pgs 36 to 49
(7) Pearl Harbor Naval Shipyard, Plan SS-269-2168996 ALT C; (SUBSAFE) Valve 2" STD Globe, Angle, and Cross Stop and Stop Checked --FLGD 350 PSI wp
(8) Partial copy of ventilation system, Plate 9 of NAVSEA 0905-LP-032-/020
(9) Naval Shipyard, Portsmouth, NH, Plan SS580-501-1639553 ALT B; Air Conditioning System
(10) Investigating Officer's Memorandum for the Record dtd 25 JUN 88
(11) Ship's 3-M History, NAMSO 4790.S5019A of 20 May 88
(12) Investigating Officer's Memorandum for the Record dtd 25 JUN 88
(13) Planned Maintenance System Manual, Maintenance Index Page 6641/5-B7, of November 1987
(14) DD Form 169 of 17 November 1983
(15) Title Page, USS BONEFISH (SS 582) Submarine Battery Record Book
(16) Three Beta video tapes of the interior of USS BONEFISH (SS 582) upon return to Naval Base, Charleston
(17) COMSUBLANT NORFOLK VA 170119Z FEB 83
(18) USS BONEFISH (SS 582) Ship System Work Description
(19) EAB COSAL Allowance Page
(20) NAVSUP Form 1114
(21) Photograph of EAB System Filter from maneuvering area
(22) Photograph of EAB System Filter from maneuvering area
(23) Photograph of EAB System Filter from maneuvering area
(24) Photograph of EAB System Filter from maneuvering area
(25) Planned Maintenance System Manual, Maintenance Index Page A-2R
(26) Copy of Safety Notice from NAVSEA 0905-LP-032-7020
(27) Memo from CDR , PMS393A2A of 3 June 1988
(28) Photograph, Battery Plenum Access
(29) Photograph, Battery Plenum Access
(30) Equipment Deficiency list/JSN Log, referencing TD-22 of 17 Apr 88
(31) Statement of YNSN(SU) in reference to TD-22
(32) Statement of CDR in reference to TD-22

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(33) Statement of MMCM(SS) in reference to TD-22
(34) Statement of LCDR in reference to TD-22
(35) Statement of MS2(SS) in reference to TD-22
(36) Statement of CWO3 in reference to TD-22
(37) Statement of MM1(SS) in reference to TD-22
(38) Statement of MS3(SS) in reference to TD-22
(39) Statement of EM3(SS) in reference to TD-22
(40) Statement of MM3(SS) in reference to TD-22
(41) Statement of MSSR(SU) in reference to TD-22
(42) Statement of LTJG in reference to TD-22
(43) Statement of SN(SS) in reference to TD-22
(44) Statement of LTJG in reference to TD-22
(45) Inventory of Periodic Maintenance Requirement of 25 February 1988
(46) SUBGEN QA Form 4355/17 of 14 May 1988
(47) SUBGEN QA Form 4355/34 of 23 November 1987
(48) Test and Inspection Form - Other than NDT of 14 May 1988
(49) Pages 15-17, Re-Entry Control Log SUBGEN QA Form 4355/11
(50) Departure from Specification Report SUBGEN QA Form 4355/12
(51) Submarine Technical Repair Standard No. 7650-086-001B CH-2
(52) USS FRANK CABLE (AS 40) Sub Safe Work Procedure Package concerning repair of lower hatch (QA File #582-88-016)
(53) Copy of Paragraph 223-6.90 of Chapter 223, Submarine Storage Batteries - Lead Acid Batteries NSTM
(54) Statement of ENC(SS) , USN concerning the Drain Pump
(55) Statement of CWO3 , USN concerning the Drain Pump
(56) Statement of MM1(SS) , USN
(57) Statement of MMCM(SS) , USN
(58) NAVSEA Form 5216/30 dtd 31 MAY 88
(59) COMSUBRON FOUR msg 011638Z MAY 87
(60) Performance Curves for Trim and Drain Pump, NAVSEA 0347-LP-266-8000
(61) Transcript of voice channel from Sonar tape recorder, USS BONEFISH (SS 582), of 24 Apr 88
(62) USS JOHN F. KENNEDY msg 200531Z APR 88
(63) Ship's Deck Log Sheet, USS BONEFISH (SS 582) dtd 24 APR 88, encompassing times 1216 to 1649
(64) Engineering Watch Supervisor's Log, USS BONEFISH (SS 582) dtd 24 APR 88, encompassing times 1018 to 1649
(65) Engineer's Bell Book, USS BONEFISH (SS 582) dtd 24 APR 88, encompassing times 0000 to 1700
(66) Statement of CDR USN, Commanding Officer
(67) Copy of paragraph 223-3.60 of chapter 223, Submarine Storage Batteries - Lead Acid Batteries NSTM
(68) Statement of LCDR , USN, Executive Officer
(69) Statement of MMC(SS) , MM1(SS) , MM1(SS) , ENC(SS) and EM3(SS) , USN
(70) Battery Log, USS BONEFISH (SS 582) dtd 24 APR 88
(71) Statement of MM1(SS) USN
(72) Statement of EMC(SS) USN
(73) Statement of EM3(SS) , USN
(74) Statment of FN(SS) USN

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(75) Statement of EM2(SS) , USN
(76) Statement of EM3 , USN
(77) Statement of EM2(SS) , USN
(78) Statement of MM3(SS) , USN
(79) Statement of MMFN(SS) , USN
(80) Statement of MMC(SS) , USN
(81) Statement of CWO3 . USN
(82) Statement of EM1(SS) , USN
(83) Statement of MM2(SS) , USN
(84) Statement of LTJG USN, with addendum
(85) Statement of MM3(SS) , USN
(86) Statement of LT , USN
(87) Statement of ET1(SS) ., USN
(88) Statement of QMCS(SS) USN
(89) Statement of LT , USN
(90) Statement of MMCM(SS) , USN
(91) Statement of STSC(SS) , USN
(92) Statement of LTJG , USN
(93) Statement of EN1(SS) , USN
(94) Statement of FTG2(SS) , USN
(95) Statement of LTJG , USN
(96) Statement of MMFN(SS) , USN
(97) Statement of RMC(SS) , USN
(98) Statement of SA(SS) , USN
(99) Statement of HMC(SS) USN
(100) Statement of MSSR(SU) , USN
(101) Statement of MS1(SS) , USN
(102) Statement of QM3(SS) USN
(103) Statement of QM3(SS) , USN
(104) Statement of MSSN(SU) USN
(105) Statement of STS3(SS) , III, USN
(106) Statement of TMSN(SU) USN
(107) Statement of EN3(SS) USN
(108) Statement of MM2(SS) , USN
(109) Statement of ET1(SS) , USN
(110) Statement of RM2(SS) , USN
(111) Statement of ET1(SS) , USN
(112) Statement of QM2(SS) , USN
(113) Statement of MM3(SS) , USN
(114) Statement of MM2(SS) , USN
(115) Statement of MM3(SS) , USN
(116) Statement of EMCS(SS) USN
(117) Statement of IC3(SS) , USN
(118) Statement of MM3(SS) USN
(119) Statement of EM3(SU) , USN
(120) Statement of ICC(SS) , USN
(121) Statement of SA(SU) , USN
(122) Statement of YN1(SS) , USN
(123) Statement of MS3 , USN
(124) Statement of SK2(SS) , USN
(125) Statement of MS2(SS) , USN
(126) Statement of SN(SS) ., USN

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(127) Statement of STS1(SS) , USN
(128) Statement of RM2(SS) , USN
(129) Statement of SN USN
(130) Statement of TMC(SS) , USN
(131) Statement of TM3(SS) USN
(132) Statement of TM1(SS) , USN
(133) Statement of ENC(SS) , USN
(134) Statement of TM3(SS) , USN
(135) Statement of FTG2(SS) , USN
(136) Statement of STS3(SS) ., USN
(137) Statement of STS2(SS) USN
(138) Statement of STS3(SU) , USN
(139) Statement of IC3(SS) USN
(140) Statement of IC2(SS) USN
(141) Statement of FTGC(SS) , USN
(142) Statement of ET2(SS) , USN
(143) Statement of FA(SS) , USN
(144) Statement of EM3(SU) USN
(145) Statement of LT USN
(146) Statement of LTJG USN
(147) Statement of SR(SU) ., USN
(148) Statement of SN(SS) , USN
(149) Statement of RM3(SU) , USN
(150) Statement of YNSN(SU) ., USN
(151) Statement of EM3 , USN
(152) Statement of ENFN(SU) USN
(153) Report of Change of Command, USS BONEFISH (SS 582) dtd 16 MAR 88
(154) CDR Memorandum to COMSUBRON FOUR concerning assessment of conditions existing on USS BONEFISH (SS 582) dtd 24 MAR 88
(155) Autopsy Protocol on LT Ray E. Everts, Jr., USN, deceased
(156) Autopsy Protocol on RM1 Robert W. Bordelon, Jr., USN, deceased
(157) Autopsy Protocol on YN3 Marshall Todd Lindgren, USN, deceased
(158) Emergency Care and Treatment Medical Records, ICO MMC(SS) , USN
(159) Emergency Care and Treatment Medical Records, ICO STS3(SS) USN
(160) Emergency Care and Treatment Medical Records, ICO ET1(SS) , USN
(161) Emergency Care and Treatment Medical Records, ICO YNSN(SU) ., USN
(162) Emergency Care and Treatment Medical Records, ICO LT USN
(163) Emergency Care and Treatment Medical Records, ICO TMC(SS) , USN
(164) Emergency Care and Treatment Medical Records, with narrative summary, ICO STS3(SS) , USN
(165) Emergency Care and Treatment Medical Records, ICO FTG2(SS) , USN
(166) Emergency Care and Treatment Medical Records, ICO IC3(SS) , USN

[redacted] Only CNSR

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(167) Emergency Care and Treatment Medical Records, ICO QMCS(SS) [redacted], USN
(168) Emergency Care and Treatment Medical Records, ICO LCDR [redacted], USN
(169) Emergency Care and Treatment Medical Records, ICO LTJG [redacted], USN
(170) Emergency Care and Treatment Medical Records, ICO FTGC(SS) [redacted], USN
(171) Emergency Care and Treatment Medical Records, ICO ENC(SS) [redacted], USN
(172) Emergency Care and Treatment Medical Records, ICO LTJG [redacted], USN
(173) Emergency Care and Treatment Medical Records, ICO MMFN(SS) [redacted], USN
(174) Emergency Care and Treatment Medical Records, ICO RM2(SS) [redacted] USN
(175) Emergency Care and Treatment Medical Records, with narrative summary, ICO EM1(SS) [redacted] USN
(176) Emergency Care and Treatment Medical Records, ICO CDR [redacted], USN
(177) Naval Hospital, Jacksonville, Florida, Narrative Summary, Standard Form 502, ICO RMC(SS) [redacted], USN
(178) Naval Hospital, Jacksonville, Florida, Narrative Summary, Standard Form 502, ICO LT [redacted], USN

1. (U) As directed by reference (a), a one-officer investigation was convened on 25 April 1988. The original record of the investigation with supporting technical documentation and photographic and televised records are forwarded as enclosures (1) through (178).

2. (U) The investigating officer, after inquiring into all facts and circumstances connected with the incident which occasioned the investigation, and having considered all readily retrievable background documents, submits the following executive summary of the fire, preliminary statement, findings of fact, opinions and recommendations.

EXECUTIVE SUMMARY OF THE FIRE

1. (U) The diesel powered attack submarine USS BONEFISH (SS 582), a unit of Submarine Squadron FOUR, homeported in Charleston, SC. was conducting ASW exercises with the USS JOHN F. KENNEDY (CV-67) CVBG [redacted]

On the afternoon of Sunday, 24 April 1988, BONEFISH was providing ASW services to USS CARR (FFG-52). In accordance with exercise directives, BONEFISH was on course 000°T, Speed 7 kts, Depth 150 ft.

[redacted] At 1631, a fire was reported in the Midships Compartment Lower Level port side in the Crew's Quarters (third street). The fire was reported as a class "C" fire in switchboard cabling on the port side of Midships Lower Level. The fire was in fact in the battery propulsion cabling between the forward battery buswork and the forward battery breakers. The crew's attempts to extinguish the fire using CO_2 extinguishers were unsuccessful as they were unable to disconnect the battery (power source) from the burning cables. At 1634, after conducting a baffle clearance maneuver, the ship proceeded to periscope depth and at 1636 prepared to surface. At 1639 the fire flashed over when the busing cables

[redacted]

shorted and a class "A" fire commenced. The noise generated from the flash over caused the Commanding Officer to order the ship emergency surfaced. Almost instantly thick black smoke filled the midships compartment. At 1640, with the ship on the surface, the bridge hatches were ordered opened. At 1641 the ship lost half of the ship's service DC and 60 Hz AC power (1B and 2S switchboards), and all 400 Hz power (1SF switchboards). At 1642, with the bridge hatches open, the ship prepared to emergency ventilate the Midships Compartment to clear the smoke in order to combat the fire. At 1649 the ship commenced emergency ventilating using #1 main engine. Smoke began to clear in the control room but remained thick in Midships Lower Level. A wall of flames was visible behind the Ballast Control Panel in the control room. At 1658, the Commanding Officer, who had been on the bridge, layed below to the control room. Simultaneously, personnel in the engineering spaces, without order from Control, started #3 main engine to increase the ventilation rate. The #3 main engine ran for approximately 30 seconds and stopped for an undetermined reason. At 1659, when the Commanding Officer arrived in the control room, he was told by the Executive Officer that the fire was out of control and he overheard words to the effect that the engine had stopped. He saw flames on the port side. Another explosion was heard and smoke engulfed the Control Room. Based on these observations the Commanding Officer ordered the ship evacuated. Eighty-nine crew members successfully evacuated the ship. Three crew members died as a result of the fire.

PRELIMINARY STATEMENT

1. (U) Captain , USN, Commander Submarine Squadron EIGHTEEN, was appointed on 25 April 1988 by Rear Admiral , USN, Commander Submarine Group SIX, to be the investigat g officer for this one-officer investigation.

2. (U) The investigation was conducted in port Charleston, SC, first, aboard the USS FRANK CABLE (AS-40) and, later, in the Reserve Training Center, Charleston, SC. The BONEFISH was moored outboard FRANK CABLE and later at Pier Romeo, Naval Station, Charleston, SC.

3. (U) Captain , assisted by two Chief Petty Officers, commenced the investigation on 25 April 1988 and the investigation was closed on 14 June 1988.

4. (U) The investigation by Captain inquired into all contributory aspects which had occurred prior to, during and following the fire. There were specific, technically complex issues that required the investigating officer to call upon the professional expertise of the Commander Naval Sea Systems Command, Navy Laboratories, Electric Boat Division, General Dynamics Corporation, Naval Submarine School (SSEP), Repair Department USS FRANK CABLE (AS-40), Naval Sea Logistics Center, Charleston Naval Shipyard, and the Armed Forces Pathology Laboratory. Particular issues that fall within this category included:

(a) (U) Mapping the fire and analysis of contributory causes.

[redacted]

ACCC

[redacted]

[redacted]

(b) (U) Analysis of structural changes in relation to their originial condition.

(c) (U) Testing of ship components.

(d) (U) Material history of shipboard components.

(e) (U) Design determination of components installed in the ship.

(f) (U) Toxological aspects.

5. (U) As the investigation progressed, the statements of witnesses were assessed and colated. The colation was checked against logs and records from both BONEFISH and CARR to establish a chronology.

6. (U) In compiling the chronology, it was necessary to reconcile inconsistencies in records which usually only varied by about a minute and the events were placed in sequence as close as possible to other events which were known to be occurring simultaneously. In compling the inconsistencies in times which were placed in crew members' statements, it was necessary to have crewmembers reenact their actions in groups such as would be done during a drill critique. Times listed in statements often differed significantly from real time but most could be ultimately correlated to known times. The genesis of the problem is that normal actions during the casualty were forgotten and the human aspect of time compression during high stress incidents occurred.

7. (U) The findings of fact, opinions and recommendations contain the investigating officer's best estimates of the evidence on record at the end of the investigation.

8. (U) All times listed are local time (+4 Quebec).

9. (U) The location of personnel at the time of evacuation was obtained from each individual's statement. Only the enclosure dealing with the first individual in each list at each location is referenced.

10. (U) Additional statements from the remaining crewmembers, not referenced in the Findings of Fact, have been included as enclosures (102) through (152).

11. (U) With reference to statements from members of the crew, signatures were obtained on the original handwritten statements but were not obtained on some of the final typed statements due to unavailability of crewmembers due to leave, transfer or TAD. The signed, handwritten statements are attached to those typed statements without signature.

FINDINGS OF FACT

A. Ship's Material History. This section incorporates the body of facts concerning the material history which was relevant to the fire on BONEFISH.

[redacted]

[redacted]

1. (U) The ship was constructed with a one quarter inch CRES plate in the area where the battery cables penetrated the lower platform deck. The remainder of the walking deck and expansion joint was constructed of medium steel. The stuffing tubes for the battery cables which penetrated the CRES plate were made of carbon steel. The expansion joint between the hull and CRES plate was made of medium steel. The weld material used to fasten the CRES plate to the expansion joint was CRES. (Enclosure (2))

2. (U) As a result of galvanic corrosion accelerlated by a water environment between the anodic steel expansion joint and cathodic stainless steel plate, a hole, six inches long by three inches wide, had developed in the waterway which violated the integrity of the Battery Compartment. (Enclosure (3))

3. (U) As a result of galvanic corrosion between the anodic steel stuffing tubes and cathodic CRES plate, six stuffing tubes had corroded away from the CRES plate. (Enclosures (3) and (4))

4. (U) The ship was constructed such that the CRES plate and stuffing tubes were an integral part of the waterway which ran from frame 33 to frame 43 on the port side outboard of the lower platform deck. The waterway did not have any drain capability. (Enclosure (2))

5. (U) Four trim system valves were located on the port side above the lower platform deck level in the waterway area directly aft of the CRES plate. (Enclosure (5))

6. (U) These valves had leaked salt water into the waterway several times since the ship's last overhaul. (Enclosure (6))

7. (U) The garbage disposal unit (GDU) and associated valving are located on the port side in the scullery. This area was nine feet aft of the CRES plate. A visual inspection showed an existing defect in the sheet metal frame forward of the GDU which permitted salt water from the GDU and associated valves to communicate into the waterway. (Enclosure (2))

8. (U) The GDU flushing valve (TD-22) had leaked several times since the ship's last overhaul. The valve was constructed such that the stem was subjected to trim discharge header pressure. (Enclosure (7))

9. (U) The crew's berthing arrangement utilized the false bulkhead/overhead arrangement which prevented observation and access to the waterway. (Enclosure (5))

10. (U) There were five cooling coils and associated condensate drain pans and drain piping located above the overhead of the crew's berthing arrangement. Two of these cooling coils were located on the port side between frames 33 and 43. (Enclosures (8) and (9))

11. (U) Due to drain line obstruction these drain pans overflowed permitting condensate to flow into the waterway. (Enclosure (10))

12. (U) The galley precipitator was out of commission between 1 February 1986 to 3 August 1986. The precipitator was again out of commission from early April 1987 to 14 July 1987. (Enclosure (11))

13. (U) The drains were not cleared until March 1988. (Enclosure (12))

14. (U) PMS coverage for clearing cooler drains was assigned to the ship under SFR 1-88. The ship had deleted the requirement. (Enclosure (13))

15. (U) The battery buses, battery cables and mounting insulators for the forward battery were examined. Heavy green corrosion products were noted on the buswork and on seven of the twelve cables. The other five cables were destroyed during the fire. (Enclosure (3))

16. (U) A battery compartment four ounce air drop test was conducted as part of the battery replacement in November 1983. The requirement was that a drop of two ounces in ten minutes was allowed. (Enclosure (14))

17. (U) The battery compartments failed this test when tested individually as required by plan. (Enclosure (14))

18. (U) In order to test the compartments a minor deviation was approved for testing the compartments together, as the reported problem when testing the compartments individually was intercommunication between the compartments via the ventilation system. (Enclosure (14))

19. (U) The battery compartments passed the four ounce air drop test when tested together, as together they lost two ounces in thirteen minutes. (Enclosure (14))

20. (U) The battery was replaced during the time frame 31 July - 7 September 1986 by Charleston Naval Shipyard, at Pier R, Naval Station, Charleston, SC. (Enclosure (15))

21. (U) The shipyard used the air hose test method to verify the integrity of the deck access cut out to replace the battery. (Enclosure (12))

22. (U) An emergency air breathing (EAB) system was installed on the ship. The original installation occurred during a regular overhaul in 1983 -1984. The system was expanded under the type commander alteration and improvement program commencing in July 1986 and is yet to be reported completed. (Enclosures (17) and (18))

23. (U) An EAB COSAL allowance was established in September 1983 and amended in January 1984. (Enclosure (19))

24. (U) Ship stock record cards show no issues of any EAB system parts since established in 1984. (Enclosure (20))

[redacted]

25. (U) The investigation team opened three EAB system filters. The filter canister in the maneuvering area was corroded on the inside and the filters showed signs of corrosion. The EAB filter canister in Sonar, added within the last year, was satisfactory. The EAB filter canister in the torpedo room showed signs of corrosion and the upper filter element was corroded such that it could not be removed from the housing without being forcibly destroyed. (Enclosures (21), (22), (23) and (24))

26. (U) The ship reported that all air systems contained excessive moisture. There was no PMS requirement to blowdown ship's air banks. The ship's information book contained a Safety Note directing the ship's to comply with Chapter 9490 of Naval Ships Technical Manual. (Enclosures (25) and (26))

27. (U) Naval Sea Systems Command has written that SS 580 Class submarines were indiviually omitted for air systems PMS and that no feedback had been submitted. (Enclosure (27))

28. (U) Four of six installed accesses to the battery plenums were not of the type specified by approved plan. The four non-approved accesses are square access plates with rubber gasket backing held down by 28 screws which penetrated the deck into the plenum. (Enclosures (2), (28) and (29))

29. (U) A review of records from the overhaul in 1983 - 1984, conducted at Charleston Naval Shipyard, shows that all areas around the forward battery well were inspected and no defects noted. (Enclosure (45))

30. (U) Prior to the casualty the ship had reported that the Garbage Disposal Unit flushing valve (TD-22) was leaking. (Enclosures (30) through (44))

31. (U) When TD-22 was removed from the system for testing subsequent to the fire, the repair activity removing the valve reported that two of the fasteners installed on one flange were of an incorrect type. (Enclosure (46))

32. (U) A review of certification paperwork of the previous installation showed that proper fasteners had been used on all joints. (Enclosure (47))

33. (U) All personnel associated with the installation of TD-22 were interviewed by the investigating team. None of the personnel interviewed claimed any knowledge of the incorrect fasteners. (Enclosure (12))

34. (U) When TD-22 was disassembled after testing, the investigating team questioned the stem seal O-ring groove. Repair activity personnel stated that the groove was satisfactory. (Enclosure 48))

35. (U) Subsequent research, by the repair activity at the investigating team's request, revealed that the O-ring groove was out of specification, and repairs were made. (Enclosure (50))

36. (U) A review of the subsequent repair of the O-ring groove by the repair activity showed that the repair, by the repair activity, had again been made incorrectly. (Enclosure (51))

[redacted]

37. (U) During the casualty, ship's personnel reported difficulty opening the upper bridge access hatch. (Enclosure (89))

38. (U) The difficulty was reported as that after going full open on the operating handle it was necessary to turn the handle one quarter turn shut to open the hatch. (Enclosure (89))

39. (U) The investigating team inspected the upper bridge hatch and found that in the full open position the locking rings lugs engaged the coaming ring lugs due to overtravel of the locking ring. (Enclosure (12))

40. (U) A review of ship's records did not find any entry documenting this deficiency. However, four different deficiencies were identified on the hatch in CY 87 but no work was accomplished. The gasket was replaced in March 1988 by ship's force. (Enclosure (49))

41. (U) During the casualty ship's personnel reported difficulty opening the engine room lower hatch. (Enclosure (93))

42. (U) The investigating team examined the lower engine room hatch and found the interlock rod missing. This permitted the locking lever to fall and engage the handwheel and prevent opening the hatch when it was shut. (Enclosure (52))

43. (U) This hatch had been repaired by a repair activity on 28 March 1988 and accepted by the ship. (Enclosure (52))

44. (U) The investigating team reviewed the work package. Upon opening the work package, the missing interlock rod and another piece were found in the package. (Enclosure (52))

45. (U) The ship was routinely charging batteries with a propulsion system ground of less than the 50 K OHMS. This procedure did not meet the requirements of Naval Ships Technical Manual, Chapter 223. No temporary standing order was in effect to cover this situation. (Enclosure (53))

46. (U) On 25 March 1988 the drain pump would not pump and was vibrating. (Enclosure (54))

47. (U) On 26 March 1988 the pump still would not pump but was no longer vibrating. (Enclosure 55)

48. (U) On 27 March 1988 the drain system was backflooded and the drain pump was able to pump bilges at a low capacity. (Enclosures (56) and (57))

49. (U) The ship tested the drain pump and determined the shut off head to be 90 psi. (Enclosure (57).

[redacted]

[redacted]

50. (U) Using shutoff head as a measure, the condition of the pump is satisfactory. (Enclosure (58)).

51. (U) The drain pump has an outstanding departure from specification which showed that the actual shutoff head as measured in May 1987 was B1 psi. (Enclosure (59))

52. (U) At a shutoff discharge head of B1 psi the pump is only B1 efficient. (Enclosure (60)).

53. (U) On 27 March 1988 the Engineer Officer was informed that the drain pump was operating satisfactorily. (Enclosure (55))

54. (U) Commander Submarine Squadron FOUR was aware of the material and personnel deficiencies existing in USS BONEFISH (SS 582). (Enclosures (153 and 154))

B. Casualty Phase. This section incorporates the body of facts which occurred prior to and during the casualty until the ship was evacuated.

55. (U) The USS BONEFISH (SS 582) was providing ASW services to the USS CARR (FFG 52) in accordance with USS JOHN F. KENNEDY (CV 67) Message 200531Z APR 88. BONEFISH was assigned the task of simulating a B1 SS targeting the CV. CARR was assigned the mission of tracking BONEFISH. (Enclosure (62))

56. (U) Between the hours of 1330 and 1515 BONEFISH was at periscope depth (Enclosures (63), (64) and (65) B1

57. (U) At 1515 BONEFISH commenced a two engine standard load normal interim battery charge B1

(Enclosures (62), (63), (64) and (66)

58. (U) In accordance with directives when charging batteries, the battery ground must be determined every fifteen minutes. The propulsion power system is configured such that the batteries, generators, and main motors are all on one common bus. At 1532 the propulsion power ground was measured at 12 K OHMS. (Enclosures (66), (67) and (68)

59. (U) The 12 K OHM ground was below that permitted for continued operation. Since all the DC power supplies and loads are on a common bus, ground isolation procedures were required to locate the source of the ground. (Enclosure (53))

60. (U) Between 1532 and 1537 ground isolation procedures were conducted on #1 and #3 propulsion generators. This required taking each generator off service one at a time. The generators were checked first as the ship had a

history of low grounds in the generators. The #3 generator was presently at 33 K OHMS. (Enclosures (69) and (70))

61. (U) AT 1537 the battery charge was secured. The action taken was to put the batteries on zero float and use the diesel generators to provide power for the main motors and ship's loads. Ground isolation procedures continued. (Enclosures (64), (69) and (71))

62. (U) At 1538 permission was granted to conduct ground isolation of the forward battery and after battery. Neither of these power supplies were initially detected to be the source of the ground due to operator error. Commenced isolating individual loads. (Enclosures (66) and (69))

63. (U) About 1600 the CARR requested that BONEFISH proceed to 150 ft. The BONEFISH OOD reported to his CO that the ground was not in either battery and that the CARR wanted BONEFISH to go to 150 ft. Based on this report, the CO directed the OOD to secure snorkeling and proceed to 150 ft. (Enclosure (66))

64. (U) At 1609 propulsion was shifted to the battery and engine cooldown was commenced. (Enclosure (63))

65. (U) At 1613 secured snorkeling. (Enclosure (63) and (64))

66. (U) At 1616 the ship proceeded to 150 ft., arriving at 1618. (Enclosure (63))

67. (U) At 1618 the junior controllerman recognized that he had not read the ground detector correctly when the forward battery had been originally isolated for ground readings. Permission was obtained by maneuvering to read the forward battery ground, and the battery was isolated. At 1619 the actual forward battery ground was determined to be 14 K OHMS, and the forward battery was returned to service contrary to the requirements of NAVSHIPS Technical Manual Chapter 223 Section 6. (Enclosures (69) and (72))

68. (U) At 1619 the Auxiliary Electrician of the Watch entered the forward battery well and noted a small leak from battery water cooling which was dripping on one of the battery cell tops. The Auxiliary Electrician of the Watch directed another crew member to report the battery water cooling leak to maneuvering, while he exited the forward well to obtain KIM-WIPES. (Enclosure (73))

69. (U) At 1621 the Auxiliary Electrician of the Watch (EM3(SS)), FN(SS) and EM2(SS) reentered the forward well to clean up the water and conduct repairs. Upon reentering the well noted an acrid odor and directed to check the lighting fixtures as the acrid ordor was simular to a failed lighting ballast. started out of the well to get EM1(SS) to assist in determining the cause of the odor. At the well hatch he encountered the CO, Engineer, s and EM2(SS) W . They discussed the battery water cooling leak. The CO then left for control to discuss propulsion limitations on a single battery with the OOD. (Both batteries were still on service) (Enclosures (73), (74) and (75)

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70. (U) At 1623 EM3(SS) noted water on the deck on the port side of crew's berthing covering the hatch to the forward battery connectors. stated this to At the same time MMC(SS) (A DIV LPO) and MM3(SS) and FN arrived to look at auxiliary tank flood and drain valves because of suspected internal leakage across the seat of TD-26 (Auxiliary Tank #2 Flood valve). and tasted the water and determined the water to be salt water. (Enclosures (76), (77), (78), (79) and (80))

71. (U) At 1624 went to manuevering to report salt water on the deck and and commenced inspection of TD valves. Other personnel commenced wiping up water on deck. (Enclosures (77), (78) and (80))

72. (U) At 1625 based on the verbal report by the EWS isolated the forward battery well. The ship was now in single battery operation. (Enclosure (72))

73. (U) At 1626 after the forward battery breakers had been opened, opened the access hatch to the forward battery connectors. He noted the lip drain full of water and water intermittently leaking onto the forward battery connectors in a pencil size stream. Leaving the hatch open he went to the air lock and reported to the Engineer that he had found the source of the ground. (Enclosures (76) and (81))

74. (U) At 1627 based on the finding of water on the cables requested rubber gloves and rubber mat so that he could wipe the water off the cables. , and left crew's berthing to inspect the Garbage Disposal Unit. (Enclosures (76), (78), (79) and (80)

75. (U) At 1630 , in the forward battery well, saw an orange glow and sparks rising in the area where the bus bars exit the well and enter the plenum. He ordered everyone in the battery well to exit the well. Petty Officer , now back at the open hatch, saw arcs and small flames on the bus bars and lugs. yelled "Fire on Third Street." (Enclosures (76) and (82))

76. (U) Word of the fire reached control via word of mouth. At 1631 the word was passed on the 1MC "Fire on Third Street." (Enclosures (61), (63) and (64))

77. (U) At the scene at 1631 obtained a CO_2 fire extinguisher from PO and commenced trying to contain the fire with short bursts. Chief took charge. left the scene to go to Crew's Mess to isolate ventilation to both battery wells. (Enclosures (76), (77), (80) and (83))

78. (U) At 1632 the XO (LCDR) and LTJG arrived at the scene. The XO took charge from Chief . Chief proceeded to Crew's Mess. LTJG manned the phones. Simultaneously all other

652
ALLB6

compartments were rigging for fire and general emergency. (Enclosures (68), (80) and (84))

79. (U) At 1634 the ship, after completing a baffle clearance maneuver, commenced proceeding to periscope depth. PO and FN arrived at the scene and continued to apply CO_2 in short burst on the fire. PO left to don an OBA. (Enclosures (63), (66), (76), (79) and (85))

80. (U) At 1635 LT relieved LTJG as scene phonetalker. The XO had ordered all unnecessary personnel to evacuate to Crew's Mess or Torpedo Room. After several discussions had ensued between control and maneuvering concerning the status of the mare island disconnects, the XO directed that these disconnects be opened. This order was never carried out as smoke was noted in the well. Efforts to control the flames at the scene became less effective as flames got larger between each shot of CO_2 and smoke began to form in the area which impeded view of the burning cables. (Enclosures (68) and (86))

81. (U) At 1636 the ship reached periscope depth and prepared to surface on the battery. Fire fighting efforts with CO_2 continued at the scene. (Enclosures (63) and (68))

82. (U) At 1638 the CO established communications with CARR and stated that BONEFISH was at periscope depth, had a fire on board with light smoke, and requested CARR standby. At the scene, flames got larger and smoke heavier. The XO directed firefighters to shut the access hatch in an attempt to smother the fire. (Enclosures (66) and (68))

83. (U) At 1639 while attempting to shut the access hatch, which was obscured in smoke, an explosion occurred. The fire had flashed over. The explosion blew personnel at the scene across the compartment against a bulkhead ten feet behind them. Thick black smoke rolled throughout the midships compartment reducing visibility to zero. The Commanding Officer ordered the ship emergency surfaced. A normal blow was conducted to surface the ship. (Enclosures (66), (68), (79), (85) and (87))

84. (U) At 1640 with the ship's depth at 28 feet and holding, the CO ordered another 20 second blow of main ballast tanks and ordered the bridge hatches opened. Personnel at the scene evacuated to Control or to the Torpedo Room. The Class "C" fire continued as evidenced by personnel hearing a series of explosions. (Enclosures (66), (68) and (88))

85. (U) At 1641 the ship lost ship service distribution boards 1B, 2S, and 1SF when the 1B-2B tie breaker on 1B tripped on fault. The trim pump was lost when 1B was lost. An unknown person, subsequently determined to be LT Everts, had gone to open the bridge hatch but was unable to get the hatch open. He returned to control. (Enclosures (64), (69) and (89))

86. (U) At 1642 LT proceeded to the bridge upper hatch and opened it as he knew that the opening handle had to be turned one quarter turn shut to open the hatch. The CO ordered that the ship prepare to emergency ventilate the midships compartment in order to gain visibility to fight the fire. (Enclosures (66) and (89))

ALL B6

[redacted]

87. (U) At 1649 emergency ventilation of the midships compartment commenced using #1 main engine. The emergency ventilation lineup was not in accordance with normal procedures as the battery well ventilation was isolated. The lineup was such that air was introduced to the ship through both the open bridge hatches and the snorkel induction. The main engine air intake was lined up to take a suction on the engine room. Midships compartment recirculation fans were energized. Air flow to the engine came through the bridge hatch - control room - down midships ladder - aft crew's mess and into engine room. The other path was directly from the snorkel induction into the engine room. When emergency ventilation was commenced smoke cleared in the control room. Smoke continued to be thick in the rest of the midships compartment and eventually became thick in the engine room. (Enclosures (63), (64), (69), (77) and (90))

88. (U) At 1655 the CO went to the bridge, determined the ship was riding low, and ordered another 20 second normal blow. (Enclosure (66))

89. (U) At 1658 the CO layed below, while unknown to him personnel in the engineering spaces started #3 main engine. #3 main engine came up to speed and then stopped for an undetermined reason. (Enclosures (69) and (72))

90. (U) At 1659 the CO arrived in the control room. He received a report from the XO that the fire was out of control. He overheard a report that the engine had stopped (the report concerned the loss of #3 main engine, #1 main engine was still running), and communications were significantly degraded. Another sound of an explosion occurred and thick black smoke again filled the control room. Based on the above the CO ordered the ship evacuated. The XO passed the word on the 1MC to evacuate the ship. (Enclosures (66) and (68))

c. Evacuation Phase. This section incorporates the body of facts which deal with the ship's evacuation.

91. (U) The word to evacuate the ship was heard over the 1 MC, in the Torpedo Room, in Maneuvering by word of mouth from EM1(SS) who had come from Crew's Mess and in Crew's Mess over the X1J sound power phones. (Enclosures (80), (82) and (91))

92. (U) The following personnel were on the bridge when the order to evacuate was given:

LT (Enclosure (89))
LT
QMCS(SS)

93. (U) The following personnel evacuated the ship through the torpedo room hatch:

LTJG (Enclosure (92))
STSCS(SS)
ENCS(SS)
EMCS(SS)
FTGC(SS)

ALL B6

TM1(SS)
STS1(SS)
QM2(SS)
STS2(SS)
STS2(SS)
MM2(SS)
SK2(SS)
MM2(SS)
ET2(SS)
MS2(SS)
MS2(SS)
MM3(SS)
IC3(SS)
QM3(SS)
EM2(SS)
EN3(SS)
EM3(SS)
TM3(SS)
MM3(SS)
STS3(SU)
EM3(SU)
TM3(SS)
IC3(SS)
FN(SS)
TMSN(SU)
SN(SS)
FA(SS)
EMFN(SS)
SR(SU)
SN(SS)

94. (U) The following personnel evacuated the ship through the Bridge Hatch:

CDR (Enclosure (66))
LCDR
LT L
LTJG
RMC(SS)
MM1(SS)
ET1(SS)
IC2(SS)
FTG2(SS)
QM2(SS)
MMFN(SS)
SN(SS)

95. (U) The following personnel evacuated the ship through the Mid Ships Hatch:

LTJG (Enclosure (84))
LTJG

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ALL B6

CWO3
MMCM(SS)
MMC(SS)
HMC(SS)
ET1(SS)
MS1(SS)
RM2(SS)
EM2(SS)
RM3(SU)
MS3(SU)
MM3(SS)
STS3(SS)
EM2(SS)
FN(SS)
MSSN(SU)
SN(SS)

96. (U) The following personnel evacuated the ship through the Engine Room Hatch:

MMC(SS) (Enclosure (69))
ICC(SS)
EMC(SS)
YN1(SS)
ET1(SS)
EM1(SS)
MM1(SS)
EN1(SS)
EN1(SS)
EN2(SS)
FTG2(SS)
RM2(SS)
MM3(SS)
EM3(SU)
EM3(SS)
MM3(SS)
EM3(SU)
YNSN(SU)
SN(SU)

97. (U) Evacuation through the engine room hatch was delayed as EN1(SS) had diffculty opening the lower hatch. The interlock rod was missing resulting in the interlock latch engaging the handwheel which prevented the handwheel from turning. was able to get the latch out of the way of the handwheel and open the lower hatch. (Enclosure (93))

FACTS CONCERNING DECEASED PERSONNEL

98. (U) LT EVERTS was the Officer of the Deck at the commencment of the casualty. At 1639 he was manning #1 periscope, at periscope depth, when thick black smoke filled the control room. He was not wearing breathing protection (EAB). After the control room filled with smoke he was relieved of the

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periscope by LT [redacted] in order to obtain an EAB. At 1640 with the ship on the surface the Commanding Officer ordered the bridge hatches opened. LT EVERTS opened the lower hatch and proceeded to the upper hatch. He was unable to open the upper hatch as he was not familiar with an existing mechanical defect of the opening mechanism. It was necessary that the handwheel be turned a quarter turn in the shut direction after fully opening to clear the locking lugs from overhaul and engagement of the coaming ring lugs. After stating that he was unable to open the hatch, he returned to the control room and collapsed. He still was not wearing breathing protection. At 1642, when the Commanding Officer was ready to go to the bridge he felt someone at his feet grabbing his leg saying he could not breathe. The CO took off his EAB and laid it on the person's (LT EVERT'S) face and proceeded to the bridge. At 1649 when smoke cleared due to emergency ventilating LT [redacted] and FTG2 [redacted] saw LT Everts lying on the deck without an EAB. They dragged LT Everts to the starboard forward side of control and [redacted] put an EAB on LT Everts. LT Everts was vomiting into his EAB. PO [redacted] stated that LT Everts was in shock, barely breathing rapid pulse, eyes rolled back and black saliva coming from nose and mouth. Personnel placed LT Everts on his side to clear his airway and subsequently PO [redacted] sitting on the deck held LT Everts upright in his lap. LT Everts did not respond to verbal commands. After the ship was ordered evacuated PO [redacted] stated that he and LT Everts were the only people in control. LT Everts was unconcious and barely breathing. PO [redacted] tried to move LT Everts but was unable. [redacted] then took off his EAB which was tangled under LT Everts and evacuated control. [redacted] told the CO that LT Everts was below when he reached the bridge. (Enclosures (66), (76), (87), (89), (94), (95) and (96))

99. (U) RMC(SS) [redacted] and RM1(SS) Bordolon were in radio during the causalty. PO Bordolon and Chief [redacted] had set up and attempted to transmit an OPREP-3 Navy Blue concerning the casualty. Black smoke started to fill radio, both donned their EAB's. Shortly after hearing the word over the 1MC to evacuate the ship, Chief [redacted] discussed with PO Bordolon that they would use the bridge hatch. As they stepped out of radio, PO [redacted] was found standing at the wardroom door. Chief [redacted] told PO [redacted] to proceed to the midships hatch, he acknowledged. Chief [redacted] and PO Bordolon proceeded to control, making their way up the hatch. Chief [redacted], followed by PO Bordolon, made it to the Nav level of the bridge. Chief [redacted] continued up, holding PO Bordolon's hand. Unable to pull him up Chief [redacted] asked for help from personnel on the bridge. The Commanding Officer and FTG2 [redacted] attempted to help by pulling on the EAB hose which was connected to PO Bordolon's belt. The attempt was unsuccessful. PO Bordolon was dropped back to the Nav level. Chief [redacted] on the bridge still had hold of PO Bordolon's EAB hose and was still yelling for help. SN [redacted] climbed back up to the bridge, went back down to the Nav level, and attempted to carry PO Bordolon up the ladder. He was unable to breath due to the smoke. SN [redacted] dropped PO Bordolon who then fell to the control room. (Enclosures (66), (94), (97) and (98))

100. (U) YN3(SS) Lindgren reported to the wardroom at the commencement of the casualty and assisted the Corpsman (HMC(SS) [redacted] MS1(SS) [redacted], and MSSN(SU) [redacted] in setting up the wardroom as a battle dressing station. Shortly before the smoke and flames reached the wardroom, at the direction of the Corpsman, he donned an Emergency Air Breathing mask. After flame and smoke entered the wardroom PO [redacted] went forward of the wardroom in the

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[redacted]

vicinity of the Yeoman's office. FN , passing by the yeoman's office, stated that he noted a figure in the door but was unable to identify the individual due to heavy smoke. When the word was passed to evacuate the ship, RMC(SS) stated that as he was leaving radio he saw PO standing by the wardroom door. Chief asked PO where his EAB was plugged into, and PO replied that it was plugged in the wardroom. Chief told PO to evacuate through the midships hatch and Lindgren acknowledged. Chief and RM1 Bordolon proceeded forward. When the ship was entered subsequent to the casualty PO was located in the Yeoman's Office. He was in a kneeling position. (Enclosures (97), (99), (100) and (101))

101. (U) LT Everts, RM1 Bordolon and YN3 Lindgren all died as a result of asphyxia secondary to smoke inhalation. (Enclosures (155), (156) and (157))

102. (U) The following personnel were treated for injuries at the Naval Hospital, Jacksonville, Florida:

MMC(SS) USN (Enclosure (158))
STS3(SS) , USN (Enclosure (159))
ET1(SS) ., USN (Enclosure (160))
YNSN(SU) ., USN (Enclosure (161))
LT , USN (Enclosure (162))
TMC(SS) , USN (Enclosure (163))
STS3(SS) ., USN (Enclosure (164))
FTG2(SS) , USN (Enclosure (165))
IC3(SS) , USN (Enclosure (166))
QMCS(SS) , USN (Enclosure (167))
LCDR . USN (Enclosure (168))
LTJG . USN (Enclosure (169))
FTGC(SS) , USN (Enclosure (170))
ENC(SS) , USN (Enclosure (171))
LTJG , USN (Enclosure (172))
MMFN(SS) USN (Enclosure (173))
RM2(SS) , USN (Enclosure (174))
EM1(SS) , USN (Enclosure (175))
CDR , USN (Enclosure (176))
RMC(SS) a, USN (Enclosure (177))
LT USN (Enclosure (178))

OPINIONS

1. (U) Inspections over an extended period of time were deficient in scope, in that the impact of existing deficiencies on ship's systems were not appreciated, and many deficiencies discovered were not corrected or properly repaired.

2. (U) Repairs to the Garbage Disposal Unit Flushing Valve (TD-22) and the lower Engine Room Hatch, conducted in accordance with Quality Assurance procedures, were deficient.

3. (U) The overtravel between the locking ring lugs and coaming ring lugs of the Upper Bridge Hatch prevented opening of the hatch and directly contributed to the death of LT Everts.

[redacted]

ALL B6

[redacted]

4. (U) Preventive Maintenence Practices were defecient. Specifically, the failure of the crew to maintain proper housekeeping standards coupled with the existing construction of the ship, set up the following chain of events:

a. The CRES plate welded to mild steel established a place for galvanic corrosion if exposed to water over a period of time.

b. The construction of the waterway permitted leaking water to accumulate and standing water to remain in the waterway.

c. The habitability hindered easy access, and effective inspection of the waterway.

d. The accumulation of leakage from the air conditioning coils, TD-22, and other valves were allowed to stand in the waterway over a long period of time. Instead of being a cause for concern and action, standing water was tolerated and leaks not promptly repaired. As a result, salt water leaking from the TD-22 was allowed to accumulate over and around the battery connecter access hatch.

6. (U) The opening of the battery connector access hatch with salt water present on the deck precipitated the fire, in that salt water drained from the hatch and deck onto the exposed corroded cables causing electrical arcing and sparks that ignited the fire.

7. B5

8. (U) That the injuries sustained by crewmembers of the USS BONEFISH (SS 582) were incurred in the line of duty and not due to their own misconduct.

RECOMMENDATIONS

1. (U) B4

2. (U) B4

3. (U) B4

4. (U) B4

Classified By: Multiple Sources
Declassify On: OADR

[redacted]

[redacted]

5. (U) That the Quality Assurance practices in the Submarine Force be reviewed and monitored to prevent repetition of the defective repairs to TD-22 and the lower Engine Room hatch.

6. (U) That the Submarine Force evaluate the provisioning of submarines with sufficient life rafts to permit the crew to escape from a stricken surfaced submarine.

7. (U) That the requirements for documenting the accomplishment of URO MRC 003 be made more stringent such that no area can escape non-accomplishment due to inaccessability.

B6

[redacted]