



DEPARTMENT OF THE NAVY
COMMANDER NAVAL AIR FORCE ATLANTIC
1279 FRANKLIN ST.
NORFOLK, VIRGINIA 23511-2494

5830
Ser N01L/272
24 Nov 14

From: Commander, Naval Air Force Atlantic
To: File

Subj: ACTION OF THE FINAL REVIEWING AUTHORITY REGARDING THE
COMMAND INVESTIGATION INTO CLASS "A" MISHAP OF VFA-143 FA-18E
BUNO #166603 THAT OCCURRED ON OR ABOUT 1430 ON 15 JANUARY 2014

Ref: (a) (b)(6) ltr 5830 of 17 Mar 14 w/ends and encls
(b) JAG Manual, Chapter II

Encl: (1) Final investigation report

1. Reference (a) has been reviewed in accordance with reference (b). Further endorsement is considered unnecessary; therefore, this investigation is final and will be retained at this command for a period of two years from the date of this action. Any further correspondence regarding this matter should be forwarded accordingly.

2. Summary. On 15 January 2014, the Mishap Pilot (MP), (b)(6) VFA-143, was seriously injured after ejecting from an F/A-18E while conducting proficiency training in the W-72 operating area off the coast of Virginia Beach, Virginia. While executing a nose low maneuver while merging with another aircraft, the MP loss situational awareness regarding his altitude, airspeed and rate of descent, descending more than 9,220 feet in just 44 seconds. Ejecting while the aircraft was flying at more than 600 knots calibrated air speed, the MP sustained numerous bone fractures, and was eventually rescued by a Navy SAR swimmer, hoisted from the water by a Navy helicopter and transported to a local hospital. The F/A-18E, valued at approximately \$85 million, was a total loss.

3. Except for the specific recommendations discussed below, the findings of fact, opinions and other recommendations in the enclosure (1) report of investigation are approved.

(b)(5)

000001

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THAT OCCURRED ON 8 JANUARY 2014

(b)(5)

d. The recommendations (#9-10) regarding amendment of the JHMCS training rules and ORM Matrix for ACM Mission Tasks Hazards and Risks are approved. Additionally, CSFWL/CSFWP will ensure a consolidated list of updated JHMCS training rules are incorporated into the core SOP. The specific Hazards and Risks listed in the JHMCS ORM matrix will include the following:

- Mid Air
- Loss of Situational Awareness
- Display Fixation

e. The recommendation (#11) regarding amendment of the JHMCS ORM Matrix for ACM Mission tasks Mitigation is approved. Specifically, Mitigation measures will include the following:

- Brief JHMCS Training Rules
- Establish flight path separation prior to a high off-boresight acquisition
- Maintain flight path separation through the merge
- Use a good instrument scan and visual lookout

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- The JHMCS shall be blanked if it compromises Situational Awareness

(b)(5)

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(b)(5)



T. M. SHOEMAKER

Copy to:
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Investigating Officer

5830
17 Mar 14

From: (b)(6)
To: Commander, Carrier Air Wing SEVEN
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Ref: (a) Chapter II, JAGMAN (2012 ed.)
Encl: (1) Carrier Air Wing SEVEN ltr. 5830 Ser N00/018 of 16 Jan 14
(2) Compact Disc containing a copy of Aircraft 103 Deployable
Flight Incident Recorder Set (DFIRS) data from 15 January
2014.
(3) Five Compact Discs of the Mishap Flight Lead's Heads Up
Display Recording
(4) Five Compact Discs of the Mishap Flight Lead's Joint Helmet
Mounted Cueing System Recording
(5) Summary of interview with (b)(6), USN
(6) Summary of interview with (b)(6), USN
(7) Summary of interview with (b)(6), USN
(8) VFA-143 15 January 2014 Schedule
(9) VFA-106 ROMAN 21 Incident Report
(10) VFA-87 PARTY 22 Mishap Report
(11) HS-11 #616 Search and Rescue Report
(12) HSC-28 BAY RIDER 46 Search and Rescue Report
(13) HSC-28 BAY RIDER 44 Search and Rescue Report
(14) Summary of interview with (b)(6), USN
(15) Summary of interview with (b)(6), USN
(16) Quick look review of BUNO 166603 DFIRS data
(17) Aircraft 103 SHARP Data
(18) Aircraft 103 Aircraft Discrepancy Book last 10 flights
Yellow Sheets and Work Orders
(19) Aircraft 103 Weight and Balance Form F
(20) Statement from (b)(6), USN
(21) Aircraft 103 Special Inspections Work Orders
(22) Summary of interview with (b)(6), USN
(23) Summary of interview with (b)(6), USN
(24) Summary of interview with (b)(6), USN
(25) Summary of interview with (b)(6), USN
(26) Naval Aviator Designation Letter dtd 4 May 2012
(27) (b)(6), USN, Flight Logbook
(28) VFA-143 Aircrew Flight Hour Summary
(29) VFA-143 Operations Summary Email
(30) Summary of interview with (b)(6), USN
(31) Summary of interview with (b)(6), USN
(32) Summary of interview with (b)(6), USN
(33) Summary of interview with (b)(6), USN
(34) VFA-143 14 January 2014 Schedule
(35) Summary of interview with (b)(6)

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- (36) Summary of interview with (b)(6) USN
- (37) OPNAV INSTRUCTION 3710.7U Pages 5-10 - 5-22
- (38) (b)(6) , USN, VFA-143 Strike Fighter Weapons and Tactics Gradesheets
- (39) (b)(6) USN, VFA-106 Basic Fighter Maneuvers Phase Gradesheets
- (40) (b)(6) USN, VFA-106 Training Jacket Summary and Review
- (41) VFA-106 BFM Phase Averages for the Last 100 Replacement Pilots
- (42) (b)(6) , USN, Signal of Difficulties Summary and Forms
- (43) VFA-143 NATOPS Jacket Audit Sheet
- (44) (b)(6) USN, Medical Upchit dtd 24 September 2013
- (45) (b)(6) USN, Medical Waiver dtd 18 February 2010
- (46) NATOPS Evaluation Report dtd 29 July 2013
- (47) NATOPS Instrument Rating Request dtd 7 August 2013
- (48) Instrument Ground School and Annual Aeromedical Requirements Completion Letter dtd 7 August 2013
- (49) Crew Resource Management Training/Evaluation Record
- (50) Operational Risk Management Training/Evaluation Record
- (51) Commander, Strike Fighter Wing U.S. Pacific Fleet and Commander, Strike Fighter Wing Atlantic Instruction 3500.10B - Joint Helmet Mounted Cueing System (JHMCS) Standard Operating Procedures
- (52) JHMCS Survey
- (53) JHMCS Air-to-Air Displays
- (54) JHMCS Familiarization Syllabus Flight Two Briefing Guide
- (55) 15 January 2014 Weather Briefs
- (56) Strike Fighter Weapons and Tactics Briefing Guide BFM Drill Standardization, Pages 11-13
- (57) Strike Fighter Weapons and Tactics Flight 2.3 Brief - High Aspect Basic Fighter Maneuvers
- (58) Strike Fighter Weapons and Tactics Flight 3.3 Brief - High Aspect Basic Fighter Maneuvers
- (59) TOPGUN Strike Fighter Training Guide
- (60) TOPGUN Manual 1v1 Air Combat Chapter 40 - Section I, April 2011, Pages 6-8
- (61) NATOPS excerpt 2-69
- (62) NATOPS excerpt 2-70
- (63) NATOPS excerpt 2-71
- (64) TOPGUN Manual 1v1 Air Combat Chapter 40, Section V, April 2011, Page 7
- (65) NATOPS excerpt 17-1
- (66) (b)(6) USN, Initial History and Physical Examination Trauma Service Report
- (67) NATOPS excerpt 17-2 - 17-3
- (68) Engineering Investigation of VFA-143 Mishap Pilot Dry Suit
- (69) Summary of Human Factors Interview with (b)(6) (b)(6) , USN

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- (70) Email Statement from (b)(6) a, USN ICO
Personal Human Factors.
- (71) DFIRS Mishap Flight Continuation Simulation
- (72) Navy Safety Center Aircraft Cost Statement
- (73) Manual of the Judge Advocate General excerpt 2-34
- (74) Manual of the Judge Advocate General excerpt 2-35
- (75) COMNAVAIRLANT FJA MFR of 28 Aug 14
- (76) OPNAVINST 3710.7U, 8.3.2.1.1
- (77) NATOPS excerpt 6-1 - 6-4

PRELIMINARY STATEMENT

1. Pursuant to enclosure (1) and in accordance with reference (a), a Command Investigation was conducted to inquire into the facts and circumstances of a Class A aviation mishap involving the loss of an FA-18E Super Hornet that occurred on 15 January 2014 while conducting 1 versus 1 High Aspect Basic Fighter Maneuvers (BFM) training in the W-72 Warning Area off the coast of Virginia. The Mishap Pilot (MP), (b)(6), USN, was recovered at sea after a successful ejection from the aircraft. The MP sustained major injuries.
2. I am qualified to conduct this investigation in accordance with 10 United States Code - Section 2255 and A-2-n of reference (a). I am a graduate of the Naval Aviation Safety Command Course and have previously served as a member of a Fleet Naval Aviation Evaluation Board (FNAEB).
3. I have met each of the Convening Authority's directives. I have investigated the cause of the accident and provided my opinions as to any fault, neglect, or responsibility. I have also provided recommendations to mitigate the possibility of this type of mishap happening in the future.
4. All relevant information was collected. All records regarding the Mishap Aircraft (MA) and MP, to include the MA Maintenance Log, MA Aircraft Discrepancy Book (ADB), the MP's Naval Air Training and Procedures Standardization (NATOPS) Record, MP's Logbook, and MP's Training Record, are retained by Strike Fighter Squadron ONE FORTY THREE (VFA-143), homeported at Naval Air Station (NAS) Oceana, Virginia. All documentary evidence enclosed is either the original or a true representation of the original.
5. A thirty day extension was requested and granted while waiting for flight profile simulations and an engineering inspection (EI) on MP's dry suit.
6. As all events related to the mishap flight (MF) occurred in the Eastern Time Zone of the United States, all times in this report are listed in Local (L) Eastern Standard Time.
7. References to the MA varied according to the phase of flight and witnesses. The MA utilized an Air Traffic Control call sign of

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TAPROOM 52 and tactical call sign of DOG 52 during the BFM phase of the MF. For consistency and clarity purposes, the MA will be referred to as TAPROOM 52 throughout this report.

8. The MA was not salvaged.

9. The information used from Enclosures 2 and 3 in the investigation is unclassified and was used to build the timeline for the MF and to provide facts applicable to the mishap. Enclosures 2 and 3 as a whole are classified. The CDs are stored in VFA-103 secure intelligence spaces.

10. The investigation references TOPGUN nose high, nose low, and level High Aspect BFM airspeed rule-of-thumbs (ROT) contained in Enclosure 60. The actual specific airspeed numbers are classified and can be found in the TOPGUN Manual per Enclosure 60.

11. Bottom line up front, this was a preventable mishap. The MP's failure to execute normal High Aspect BFM mission cross check scan of the MA's altitude, airspeed, and rate of descent and execute basic High Aspect BFM stick and throttle mechanics for a nose low maneuver led directly to the loss of the aircraft. If the MP had executed a normal mission cross check scan and High Aspect BFM maneuvers per established Tactics, Techniques, and Procedures (TTPs), there would not have been a mishap. This primary causal factor, along with the contributing factors of the MP's general lack of flight proficiency going into the MF, lack of proficiency in executing High Aspect BFM flights, lack of proficiency in wearing and employing the Joint Helmet Mounted Cueing System (JHMCS), and a flight brief that failed to brief to the substance and depth required to mitigate the Operational Risk Management (ORM) associated with the MP and MF execution, all combined to contribute to this mishap.

12. Particular attention should be paid to the throttle position used by the MP throughout all four High Aspect BFM sets and the execution of a nose low maneuver, with regard to airspeed, altitude lost, rate of descent, and situational awareness, during the second High Aspect BFM set and the mishap High Aspect BFM set.

FINDINGS OF FACT

I. INTRODUCTION

1. Aircraft side number 103, Bureau Number (BUNO) #166603, was lost at sea at approximately 1430L on 15 January 2014 in the W-72 Warning Area off the coast of Virginia. [Encls (1), (2), (3), (4), (5), (6), (7), (8), (9), (10), (11), (12), (13), (14), (15), (16)]

2. The Deployable Flight Incident Recorder Set (DFIRS) was recovered. [Encls (2), (14), (16)]

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3. The DFIRS file contents were intact with no checksum or consistency errors. [Encl (2), (16)]
4. DFIRS recorded the last 27 minutes of flight data, from time 14:02:53L to 14:30:07L. [Encls (2), (16)]

II. BACKGROUND

AIRCRAFT 103, BUNO #166603 (LOT 27)

5. The aircraft involved in the mishap was an FA-18E Super Hornet, side number 103, assigned to VFA-143. [Encls (2), (5), (6), (16), (17), (18), (19)]
6. VFA-143 was in compliance with all required and pertinent maintenance directives for aircraft 103. Additionally, there were no unresolved major discrepancies. [Encls (18), (20), (75)]
7. Aircraft 103 had 3,653.5 total hours on the airframe, flown 22.6 hours since the last 14 Day Special Inspection, 17.7 hours since the last 28 Day Special Inspection, and 51 hours since the last 84 Day Special Inspection. [Encls (17), (18), (21)]
8. There were no outstanding maintenance actions or issues related to flight critical systems over the last 10 flights when aircraft 103 was signed for and accepted as Safe-for-Flight on 15 January 2014. [Encls (18), (21)]
9. There were no flight critical Monitoring Status Panel (MSP) codes or Flight Control System (FCS) Built in Test (BIT) Logic Identification Number (BLIN) codes identified during the first two flights aircraft 103 flew on 15 January 2014, or prior to aircraft 103 taxiing out of VFA-143's aircraft line on the MF, or during the last 27 minutes of the MF. [Encls (2), (5), (16), (18), (22), (23)]
10. No aircraft discrepancies or system issues were identified by the MP or communicated to the Mishap Flight Lead (MFL) during the MF. [Encls (5), (6), (7)]
11. No flight critical issues or system discrepancies were identified or experienced by aircrew who had flown aircraft 103 over the prior three days leading up to the MF. [Encls (18), (22), (23), (24), (25)]
12. Aircraft 103 was configured with a single centerline fuel tank on Station 6 and a single Improved Multiple Ejector Rack (IMER) on Station 3. An air-to-ground store code for a MK-76 practice bomb was entered into the aircraft's Store Management System. [Encls (8), (19)]
13. Aircraft 103's gross weight was 34,110 pounds. [Encl (19)]

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AIRCREW

14. The MP, (b)(6), USN, was commissioned through the Officer Candidate School and designated a Naval Aviator on 4 May 2012. The MP completed Fleet Replacement Squadron (FRS) training at Strike Fighter Squadron ONE ZERO SIX (VFA-106) in June 2013. He joined VFA-143 in July 2013. He has 428.2 total hours and 187.7 hours in the FA-18E/F Super Hornet. (b)(6) was on active duty at the time of the mishap. [Encls (26), (27), (28), (29), (75)]

15. The MP was not involved in any accidents or flight rule violations while at the Training Command or VFA-106. [Encl (27)]

16. Since joining VFA-143, the MP had flown 57.4 hours. VFA-143 returned from deployment on 2 July 2013. The squadron was not allocated flight hours for July 2013. MP flew 10.9 hours in August 2013, 14.3 hours in September 2013, 15.4 hours in October 2013, 7.1 hours in November 2013, 4.4 hours in December 2013, and at the time of the mishap, 5.3 hours in January 2014. In the past 90 days the MP had 23.7 hours and 14 hours over the last 60 days. By comparison, the one other LTJG pilot in VFA-143 had 28.8 hours over the last 90 days and 19.3 hours over the last 60 days. [Encls (27), (28), (29)]

17. The last flight the MP flew in December 2013 was on 13 December 2013. The first flight the MP flew after the holiday leave period was on 6 January 2014. The time between these two flights was 23 days. [Encls (27), (28), (29)]

18. The MP pilot had flown four flights in January 2014 prior to the MF. On 6 January 2014 he flew a 2 v 2 Air Intercept Control (AIC) flight. On 9 January 2014 he flew a 2 v X AIC flight. On 10 January 2014 he flew the JHMCS Familiarization Syllabus Flight Two. On 13 January 2014 the MP flew a Red Air flight. [Encls (27), (29)]

19. The MP was dealing with personal issues during November 2013 and December 2013, and, combined with the holiday leave, this limited his flight time during this period. In November 2013 (b)(6)

(b)(6)

(b)(6) The MP made these human factor issues known to his chain-of-command. [Encls (5), (6), (30), (31), (32), (33)]

20. In order to give the MP time to address these human factor issues, the Commanding Officer elected to not have the MP travel with the rest of the squadron for a detachment to Eglin Air Force Base between 4 December 2013 and 18 December 2013. [Encls (6), (32)]

21. The MP stated by January 2014 these personal issues had been resolved and there were no personal stressors or human factors that would have affected his preparation, focus, or performance on the MF. [Encl (6)]

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22. The MP stated he had a good night's sleep the night prior to the mishap, he could not remember exactly how much sleep he got. [Encl (5)]

23. The MP could not remember exactly what time he left VFA-143 spaces on 14 January 2014, but stated he does know it was before 2000. [Encl (5)]

24. OPNAVINST 3710.7U requires flight crew to be provided sufficient crew rest, the non-duty time before a flight duty period begins which is to include free time for meals, transportation and rest, including an opportunity for 8 hours of uninterrupted sleep time for every 24-hour period. Crew rest does not begin until after termination of official duties and is required prior to reporting for preflight preparations. Crew rest period can be reduced to less than 12 hours in order to maintain a 24-hour work/rest scheduled, but a shortened crew rest period must always include an opportunity for 8-hours of uninterrupted sleep. [Encl (76)]

25. The MP and his fiancé both stated there was nothing unusual or out of the ordinary with regards to the 72 hour history prior to the mishap, and there were no personal issues or distractors during this time period. The MP stated that on 15 January 2014 he was "mentally clear", it was a "good day", and (b)(6) [Encls (5), (35)]
(b)(6)

26. During the five flight briefs in January 2014, the MP was asked if there were any personal human factor ORM issues that would affect his ability to execute the flights safely. He did not offer up any personal human factor ORM issues. [Encls (6), (7), (30), (31), (36)]

27. OPNAV Instruction 3710.7U defines Air Combat Maneuvering (ACM) currency for aircrew with less than 750 hours in strike fighter aircraft as being required to have flown one flight within the previous six days, two flights within the previous 14 days, and one of those flights shall be in a dynamic maneuvering hop in the Type/Model (FA-18) aircraft ACM will be conducted. The MP had flown four flights within nine days of the MF with dynamic maneuvering executed on all four flights. Per OPNAV Instruction 3710.7U currency requirements the MP was current to execute a BFM flight on 15 January 2014. [Encls (27), (28), (29), (37)]

28. MP had flown 41 total flights with VFA-143. MP had logged BFM on 15 of these flights. [Encls (27), (29)]

29. MP had completed three BFM Strike Fighter Weapons and Tactics (SFWT) Syllabus flights, SFWT 2.0 - BFM Sight Picture Drill on 13 August 2013, 2.1 - Offensive BFM on 15 August 2013, and 2.2 - Defensive BFM on 25 October 2013. [Encls (27), (38)]

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30. No persistent negative performance trends, habits, or unsatisfactory BFM skills were noted. [Encls (6), (30), (31), (32), (33), (38)]

31. At the time of the mishap, the MP had not flown the SFWT syllabus flight 2.3 - High Aspect BFM. [Encls (27), (33), (38)]

32. The last SFWT BFM syllabus flight the MP flew was on 25 October 2014, the SFWT 2.2 - Defensive BFM. [Encls (27), (38)]

33. The MP flew nine BFM Category One Pilot Syllabus flights while a student at VFA-106, to include two High Aspect BFM flights. [Encls (39), (40)]

34. The two VFA-106 High Aspect BFM syllabus flights occurred on 12 February 2013 and 14 February 2013 respectively. [Encls (39), (40)]

35. The MP had a BFM Phase grade point average (GPA) of 3.27; the overall BFM Phase GPA average for the past 100 FA-18E/F Category One student pilots is 3.35. [Encls (39), (40), (41)]

36. The MP had a GPA of 3.40 and 3.45 on the two High Aspect BFM flights. The GPA average for the past 100 FA-18E/F Category One student pilots is 3.41 and 3.55 respectively for these two High Aspect BFM flights. [Encls (39), (40), (41)]

37. No persistent negative performance trends, habits, or unsatisfactory BFM skills, to include nose low maneuvers, were noted of the MP during the VFA-106 BFM syllabus. [Encl (39), (40), (42)]

38. At the time of the mishap, the MP had a current Medical Up Chit, was NATOPS qualified, Instrument qualified, and was current on ORM and Crew Resource Management (CRM) required annual training. [Encls (43), (44), (45), (46), (47), (48), (49), (50)]

39. The MP is regarded by VFA-143's Commanding Officer, Executive Officer, Operations Officer, and Training Officer as an average to above average nugget aviator who was always well prepared for any evolution. The MP's Training Record does not indicate persistent negative trends, habits, or performance deficiencies. There were no issues noted about the MP's performance or capabilities during VFA-143's Human Factor Councils. [Encls (6), (30), (32), (33), (38), (39), (40), (42)]

JHMCS

Note: I believe the MP's lack of proficiency and experience in wearing and employing the JHMCS was a contributing factor to the mishap. Therefore, I believe it is necessary to understand the JHMCS program to not only document the lack of proficiency and experience of the MP, but to also lay the foundation for opinions and recommendations to prevent this type of mishap from occurring in the future.

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40. JHMCS Training Rules are covered under the OPNAV Instruction 3710.7U ACM Training Rules. The JHMCS Training Rules are "(1) All aircrew participating in intercept phases of air-to-air events must be made aware that JHMCS high off-boresight and/or forward quarter acquisitions will be executed if so planned. (2) Flight path separation must be established prior to any high off-boresight or forward quarter JHMCS acquisition. Inside 9000 feet (1.5 NM), the pilot's undivided attention shall first be devoted to maintaining flight separation. Inside 9000 feet, off-boresight missile attacks may be prosecuted down to missile minimum range provided that flight separation has already been established. When in doubt, broadcast own intentions and "Blank for SAFETY." (3) Obtaining tallies at the merge is most important. The JHMCS display shall be blanked if at any time the display symbology interferes with obtaining timely tallies or maintaining proper lookout doctrine." [Encl (37)]

41. The JHMCS ORM Matrix is contained within the JHMCS Standard Operating Procedures (SOP). For a BFM flight the ORM Matrix states "Mission Tasks - A/A High Off-Boresight Acquisition and ACM. Hazards/Risks - Mid-air. Mitigation - *Brief JHMCS Training Rules, *Establish flight path separation prior to a high off-boresight acquisition, *Maintain flight path separation through the merge." [Encl (51)]

42. Per JHMCS SOP, "Display Fixation. Normal mission cross check times and visual lookout doctrine for the operating flight environment (i.e, low level, formation, Air Intercept Control (AIC), etc.) shall be used. The JHMCS shall be blanked if the added symbology and/or display fixation begins to compromise situational awareness." [Encl (51)]

43. Per JHMCS SOP, the JHMCS Ground Training Syllabus includes completing the JHMCS Interactive Courseware. [Encl (51)]

44. A survey was conducted of the 17 VFA squadrons located at NAS Oceana to determine how many squadrons required JHMCS Trainees to complete the JHMCS Interactive Courseware per the JHMCS SOP. 11 squadrons responded. 10 of 11 squadrons (90%) replied no and did not know the JHMCS Interactive Courseware existed. 1 of 11 (10%) replied they knew the JHMCS Interactive Courseware existed but did not believe it was required to complete the JHMCS Syllabus. VFA-143 responded they did not require JHMCS Trainees to complete the JHMCS Interactive Courseware and did not know the courseware existed. [Encls (52), (75)]

45. The MP did not complete the JHMCS Interactive Courseware. [Encls (52), (75)]

46. In Air-to-Air mode, the JHMCS displays altitude, airspeed, aircraft heading, alpha, mach number, instantaneous G, Max G pulled during the flight, heading where the JHMCS is pointed, degrees up and down where the JHMCS is pointed, weapon selected, and selected RADAR

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mode and weapon employment information. It does not display an attitude reference or rate of descent. A pilot cannot discern aircraft angle-of-bank or how many degrees nose high or low the aircraft is during a nose high or low maneuver. [Encl (53)]

47. The MP flew the JHMCS Familiarization Flight One per the JHMCS SOP on 25 November 2013. [Encls (27), (30)]

48. This flight was rated as above average by the instructor and no JHMCS equipment issues were relayed by the MP to the instructor. [Encl (31)]

49. The MP was JHMCS qualified with the completion of the JHMCS Familiarization Syllabus Flight Two on 10 January 2014. [Encl (27), (29), (31), (51)]

50. The JHMCS Familiarization Flight Two was conducted according to the JHMCS Briefing Guide. The flight included, 4 BFM sets, of which 3 are High Aspect Butterfly BFM sets. [Encls (31), (54)]

51. The three Butterfly BFM sets executed during the JHMCS Familiarization Flight Two require the JHMCS Trainee to perform two nose high maneuvers and one level maneuver at the initial merge. The syllabus does not require the JHMCS Trainee to perform a nose low BFM maneuver at the initial merge. [Encl (54)]

52. The MF on 15 January 2014 was the MP's first flight fully qualified with the JHMCS. [Encls (5), (27), (29)]

53. The MP stated his JHMCS symbology was "skewed" during his first two JHMCS flight. Additionally, the visor for the JHMCS was difficult to latch down. [Encls (5), (31)]

54. The MP discussed these issues with the instructor for the JHMCS Familiarization Syllabus Flight Two. [Encls (5), (31)]

55. After a thorough debrief and evaluation of the MP's tape recording of the flight, the instructor determined the "skewed" symbology was normal JHMCS designation location display error and symbology lag often experienced by JHMCS equipped aircrew. [Encl (31)]

56. The instructor conducted a thorough debrief of the JHMCS Familiarization Syllabus Flight Two. There were no deficiencies in the MP's performance noted. The instructor rated the flight as above average. [Encl (31)]

57. The instructor told the MP to address the latch issue with VFA-143's Parachute Riggers (PRs). [Encl (31)]

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58. MP stated he reported the JHMCS latch issue to VFA-143's PRs and that he had not had time to sit down with the PRs to correct the issue. [Encl (5)]

59. MP stated he did not think the JHMCS issues were a safety-of-flight, but just a "distraction." [Encl (5)]

III. 15 JANUARY 2014

Preflight to Start of the BFM Phase of the Mishap Flight

60. The MF was scheduled and approved for flight by Commanding Officer, VFA-143. The flight was scheduled for a 1200L Brief, 1345L Takeoff, and a 1445L Land. [Encls (8), (75)]

61. The MF was scheduled as a lvl flight. No specific mission, i.e. BFM or AIC, or SFWT syllabus event was documented on the flight schedule. [Encl (8)]

62. The MFL was assigned aircraft 100 with the call sign TAPROOM 51. The MP was assigned aircraft 103 with the call sign TAPROOM 52. [Encl (3), (4), (6), (8), (17), (18), (75)]

63. The MP was scheduled as a Hot Switch into the MA. Prior to the MF, aircraft 103 had flown a Close Air Support (CAS) training flight involving dynamic maneuvering and an instrument flight not involving dynamic maneuvering. [Encls (8), (22), (23)]

64. The weather during the time of flight was forecasted to be 10 miles visibility, clouds scattered at 3100 feet and broken at 25,000 feet, altimeter 2986, and winds from 120 degrees at 7 knots. The MFL stated the observed weather at the time of the mishap was sky clear with a well-defined horizon. [Encls (6), (55)]

65. The MP was scheduled for a Large Force Exercise (LFE) planning evolution at Strike Fighter Weapons School Atlantic (SFWSL) beginning at 0800. [Encls (5), (8)]

66. The MP stated he arrived at SFWSL just prior to 0800. [Encl (5)]

67. The MP does not remember what time he left the planning evolution but does remember eating lunch in VFA-143 spaces prior to the MF brief. [Encl (5)]

68. The brief was delayed by 15 minutes because the MFL was attending a meeting at Carrier Air Wing SEVEN (CVW-7) spaces. [Encl (6)]

69. Per OPNAV Instruction 3710.7U, "Squadron commanders shall ensure that all participants are qualified and current in order to participate in ACM. ACM training flights shall be conducted under a formal training syllabus under direct supervision of mature,

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experienced flight leaders and only after all participants have been thoroughly briefed on the conduct of the flight." [Encl (37)]

70. The MFL briefed the flight per NATOPS briefing guidelines. [Encls (5), (6), (77)]

71. The MF was briefed in two parts. Part one focused on coordinating with TAPROOM 61, a VFA-143 air-to-air tanker configured aircraft, to practice air-to-air refueling. Part two focused on the BFM phase of the flight. [Encls (5), (6)]

72. During the ORM portion of the flight brief, the MFL and MP addressed the MP's proficiency, to include the lack of flight time over the past two months. All other ORM factors associated with a BFM flight, to include mid-air potential, lost sight, loss of situational awareness, G-Induced Loss of Consciousness (GLOC) were briefed. No personal human factor ORM issues were raised by the MP or the MFL. [Encls (5), (6)]

73. The MFL briefed the MP the flight was not a SFWT Syllabus flight and was being flown to increase aircrew proficiency. [Encl (6), (32), (33)]

74. ACM and JHMCS Training Rules were briefed as required by OPNAV Instruction 3710.7U. [Encls (5), (6), (37) and (75)]

75. The MP wore the JHMCS during the MF. [Encls (5), (75)]

76. The MP did not address the JHMCS symbology "distraction" or latch issue with the MFL at any point during the flight brief or MF. [Encls (5), (6)]

77. The BFM portion of the brief focused on the position, altitude, distance, speed (PADS) for the flight. The flight was briefed as three High Aspect BFM sets, the second BFM set was executed twice during the MF. The first set was briefed as an 18,000 feet Mean Sea Level (' MSL), 350 Knot Indicated Airspeed (KIAS), 1.5 nautical mile (NM) abeam cooperative Butterfly BFM set. The second set was briefed as a 14,000' MSL, 350 KIAS, 1.5 NM abeam non-cooperative Butterfly BFM set while the third set was briefed as 12,000' MSL, 350 KIAS, 2.0 NM Abeam set. (During the execution of the MF, the third set was audibled to a 14,000' MSL, 350 KIAS, 1.5 NM abeam non-cooperative Butterfly BFM set and the fourth set was executed at the parameters briefed for the third set). [Encls (5), (6)]

78. Per the BFM Drill Standardization section of the SFWT Briefing Guide, the standard Butterfly PADS are both aircraft at 350 KIAS and 1.5 NM abeam. [Encl (56)]

79. No standard PADS altitude for a Butterfly BFM set is listed in the SFWT Briefing Guide. For the SFWT Syllabus Flight 2.3 and 3.3 - High Aspect BFM flights, with an assumed Hard Deck of 5000' Above

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Ground Level (AGL), per ACM Training Rules, the prescribed altitudes for the Butterfly sets are Hard Deck + 9000 feet (14,000' MSL), 22,000' MSL, and Hard Deck + 2000 feet (7000' MSL). [Encls (37), (56), (57), (58)]

80. TOPGUN references the Strike Fighter Training Guide (SFTG), which is not distributed to Fleet squadrons, for Butterfly and BFM PADS standardization. [Encl (59), (75)]

81. The SFTG lists Butterfly PADS as 350 KIAS, 1.5 NM abeam, with the same three altitudes, 22,000' MSL, Hard Deck + 9000 feet, and Hard Deck + 2000 feet. [Encls (57), (58)]

82. Per the BFM Drill Standardization section of the SFWT Briefing Guide, the standard PADS for an Abeam BFM set are "Aircraft will start abeam at the briefed altitude, airspeed and separation." [Encl (56)]

83. For SFWT Syllabus Flight 2.3 and 3.3 - High Aspect BFM flights, the prescribed Abeam PADS, assuming a 5000' AGL Hard Deck per ACM Training Rules, are Hard Deck + 13,000 feet (18,000' MSL), 350 KIAS, and 1.5 NM abeam, or Hard Deck + 13,000 feet (18,000' MSL), 350 KIAS, and 1.0 NM abeam. [Encls (57), (58)]

84. The TOPGUN SFTG lists three ABEAM PADS. 1. Hard Deck + 13,000 feet (18,000' MSL), 350 KIAS, and 1.5 NM abeam. 2. Hard Deck + 10,000' feet (15,000' MSL), 300 KIAS, and 1.0 NM abeam. 3. Hard Deck + 10,000 feet (15,000' MSL), 400 KIAS, and 2.0 NM abeam. [Encl (59)]

85. The MFL stated the PADS he briefed and executed for the MF were the standard PADS he used for non-syllabus High Aspect BFM flights. The MFL stated he would lower the PADS altitudes as the flight progressed to account for fuel burn and the increased capabilities of the aircraft at a lower fuel weight. [Encl (6), (75)]

86. The MFL elected to execute a Hard Deck + 7000 feet (12,000' MSL with a 5000' AGL Hard Deck) for the last set because it allowed one nose low maneuver, if executed properly, with 3000-2000 feet extra altitude prior to the aircraft reaching the Hard Deck. [Encl (6), (37)]

87. The MFL did not brief this nose low maneuver reasoning and execution contingency for the Hard Deck + 7000 feet (12,000' MSL) PADS to the MP. [Encl (6)]

88. The MFL did not brief the established TTPs per the TOPGUN airspeed ROTs for nose high, nose low, and level maneuvers, High Aspect BFM stick and throttle mechanics, or High Aspect BFM gameplan execution for nose high, nose low, and level maneuvers at the initial merge or for follow-on BFM. [Encls (5), (6)]

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89. The MP stated he had all TPPs for High Aspect BFM employment memorized, to include airspeed ROTs and stick and throttle mechanics for a nose low maneuver. [Encl (5)]

90. The MP rated himself as being "moderately proficient" going into the MF. [Encl (5)]

91. The MP did not have any questions for the MFL at the end of the flight brief. [Encl (5)]

92. The MP signed for aircraft 103 via the Optimized Organizational Maintenance Activity (OOMA) system at time 1256L. [Encl (18)]

93. The MP executed the hot switch to man-up aircraft 103. [Encls (5), (8), (23)]

94. No issues with aircraft 103 were identified by the off-going pilot, (b)(6), USN. [Encls (5), (23)]

95. The MP stated there were no issues with aircraft 103 during the man-up or through the portions of the flight he could remember. [Encl (5)]

96. The MF took off from NAS Oceana at 1349L. [Encl (17)]

97. The administrative and air-to-air tanking practice with TAPROOM 61 was executed as briefed. No degradation to the MA or performance issues by the MP were noted by the MFL, TAPROOM 61 pilot, or communicated by the MP. [Encls (5), (6), (7)]

98. Per OPNAV Instruction 3710.7U, the MF executed a required "G" awareness maneuver (G-Warm) procedure prior to commencing the High Aspect BFM phase of the flight. [Encls (5), (6), (37)]

99. The MP stated he experienced no physiological issues with the G-Warm. The MP further stated he has never had a physiological issue with G tolerance or any physiological issues in an aircraft. [Encl (5)]

100. The MFL determined the weather in the W-72 Warning Area as sky clear with a defined horizon. Therefore, the MFL established a Hard Deck of 5000' MSL and Soft Deck of 10,000' MSL per the ACM Training Rules. Meaning no BFM maneuvering was allowed for either aircraft below 5000' MSL. [Encls (6), (37)]

THE HIGH ASPECT BFM PHASE OF FLIGHT

Note: Given the dynamic nature and difficulty in accurately portraying, in writing, the constant maneuvering of each aircraft during a BFM flight, I have focused on the flight parameters of TAPROOM 52 and, where applicable, TAPROOM 51 that go to show trends in

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performance and situational awareness of the MP that may have played a factor in the mishap.

101. The MP stated he does not recall the details of the flight beginning with the BFM phase of the flight, with no recollection of the mishap. [Encl (5)]

First BFM Set

102. The First High Aspect BFM PADS was an 18,000' MSL, 350 KIAS, 1.5 NM abeam Butterfly BFM set. TAPROOM 51 was on the left, TAPROOM 52 was on the right. [Encls (2), (3), (4), (6)]

103. 14:17:26L - TAPROOM 51 transmitted "speed and angels left", indicating the aircraft was positioned on the proper PADS. TAPROOM 51 was at 18,140' MSL, 351 KIAS. [Encls (3), (4)]

104. 14:17:30L - TAPROOM 52 transmitted "speed and angels right." TAPROOM 52 was at 18,270' MSL, 356 KIAS, and 1.5 NM abeam TAPROOM 51. [Encls (2), (3), (4)]

105. 14:17:35L - TAPROOM 51 and TAPROOM 52 took a 30 degree heading cut away from each other to set up the fight. [Encls (2), (3), (4)]

106. 14:17:57L - TAPROOM 51 transmitted "turning in, visual, left-to-left" to establish the first merge. MP responded "turning in, visual, left-to-left." [Encls (3), (4)]

107. 14:18:23L - TAPROOM 51 transmitted "fights on" to indicate both aircraft were now cleared to execute BFM maneuvers. The MF executed a left-to-left initial merge. TAPROOM 52 was at 17,940' MSL, 372 KIAS, 4 degrees nose low, 20 degrees left angle-of-bank (AOB), throttles are at full military power. [Encls (2), (3), (4)]

108. 14:18:25L - MP moved the throttles to maximum power. TAPROOM 52's throttles would remain at maximum power for the remainder of this first BFM set, until time 14:19:25L. [Encl (2)]

109. 14:18:28L - MP rolled wings level and executed a nose high maneuver. TAPROOM 52 is at 17,870' MSL, 362 KIAS, throttles at maximum power. [Encl (2)]

110. 14:18:40L - MP began a 140 degree left hand overbank to bring the nose of the aircraft towards the horizon. TAPROOM 52 was at 21,520' MSL, 98 KIAS, 28 degrees nose up, 140 degree left hand AOB, throttles at maximum power. [Encl (2)]

111. 14:18:45L - TAPROOM 52 would reach its highest altitude and slowest airspeed of this set at 22,208' MSL and 68 KIAS, throttles at maximum power. [Encl (2)]

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112. 14:18:49L - TAPROOM 52's nose reached the horizon at 22,070' MSL, 82 KIAS, 40 degree left hand AOB, throttles at maximum power. [Encl (2)]

113. 14:18:52L - TAPROOM 52 was established in a slow speed left hand turn. [Encl (2)]

114. 14:19:07L - MP initiated a nose low maneuver. TAPROOM 52 began the maneuver at 19,570' MSL, 134 KIAS, 9 degrees nose up, 30 degree left hand AOB, throttles at maximum power. [Encl (2)]

115. 14:19:13L - MP began to bring the nose of the aircraft towards the horizon. TAPROOM 52 was at 18,050' MSL, 152 KIAS, 37 degrees nose low, 30 degree left hand AOB, throttles at maximum power. [Encl (2)]

116. 14:19:22L - TAPROOM 52's nose reached the horizon. TAPROOM 52 was at 16,300' MSL, 174 KIAS, 30 degree left hand AOB, throttles at maximum power. [Encl (2)]

117. 14:19:25L - The MP established a slow descending left hand turn for the remainder of this First BFM set. [Encl (2)]

118. 14:20:05L - TAPROOM 51 transmitted "knock it off" to cease BFM maneuvering for both aircraft. TAPROOM 52 was at 12,850' MSL, 124 KIAS, 70 degree left hand AOB, 2 degrees nose up, 0 feet per minute (FPM) rate of descent (ROD), throttles at maximum power. [Encls (2), (3), (4)]

Second BFM Set

119. The Second High Aspect BFM PADS was a 15,000' MSL, 350 KIAS, 1.5 NM abeam Butterfly BFM set. TAPROOM 51 was on the right, TAPROOM 52 was on the left. [Encls (2), (3), (4)]

120. 14:22:35L - TAPROOM 51 transmitted "speed and angels right." TAPROOM 52 immediately responded "speed and angels left." TAPROOM 52 was at 15,070' MSL, 346 KIAS, and 1.6 NM abeam. [Encls (2), (3), (4)]

121. 14:22:41L - TAPROOM 51 and 52 took a turn away from each other to set up the fight. [Encls (2), (3), (4)]

122. 14:23:00L - TAPROOM 51 transmitted "turning in, visual, right-to-right." MP responded with "turning in, visual, right-to-right." [Encls (3), (4)]

123. 14:23:14L - TAPROOM 51 transmitted "fights on." The MF executes a right-to-right merge. TAPROOM 52 was at 14,880' MSL, 384 KIAS, 2 degrees nose up, 85 degrees right hand AOB, throttles at full military power, 4.3G pull, and begins a level right hand turn. [Encls (2), (3), (4)]

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124. 14:23:23L - TAPROOM 52 repositioned slightly nose low and began a slow descent while in a right hand turn. TAPROOM 52 was at 14,650' MSL, 407 KIAS, 10 degrees nose low, throttles at full military power, 74 degree right hand AOB, 0.8G pull, -9110 FPM ROD. TAPROOM 51 was below TAPROOM 52 at 13,600' MSL and began a pull to a nose high maneuver. [Encls (2), (3), (4)]

125. 14:23:30L - TAPROOM 52 executed a nose low maneuver. MP selected maximum power as he initiated the maneuver. TAPROOM 52 was at 13,140' MSL, 440 KIAS, 23 degrees nose low, rolled to a 140 degree right hand AOB, 4.6G initial pull, -17,030 FPM ROD, throttles at maximum power. [Encl (2)]

126. 440 KIAS is above the TOPGUN airspeed ROT for a nose low maneuver. [Encls (2), (60)]

127. TAPROOM 52's G pull fluctuated between 6.59Gs and 7.21Gs throughout the nose low maneuver. [Encl (2)]

128. 14:23:33L - TAPROOM 51 continued a nose high maneuver above TAPROOM 52. TAPROOM 52 was at 11,890' MSL, 456 KIAS, 55 degrees nose low, rolling in a right hand turn, 6.9G pull, -40,310 FPM ROD, throttles at maximum power. TAPROOM 51 is at 14,170' MSL, 303 KIAS, 5.5 degrees nose up, 90 degree right hand AOB. [Encls (2), (3), (4)]

129. 14:23:41L - TAPROOM 52 reached the bottom of the nose low maneuver. TAPROOM 52 was at 7500' MSL, 513 KIAS, 3 degrees nose up, wings level, 6.8G pull, 0 FPM ROD, throttles at maximum power. [Encl (2)]

130. TAPROOM 52 lost 5,640 feet and accelerated by 73 KIAS during the nose low maneuver. [Encl (2)]

131. 14:23:43L - TAPROOM 51 was above TAPROOM 52 and had positioned the aircraft to be in the sun from TAPROOM 52's line of sight to TAPROOM 51. TAPROOM 52 lost sight of TAPROOM 51 in the sun and called "blind", as required by the ACM Training Rules. TAPROOM 52 began to pull nose high to maneuver. TAPROOM 51 began a nose low maneuver to position the aircraft for a simulated weapons employment. TAPROOM 52 was at 7950' MSL, 491 KIAS, 25 degrees nose up, wings level, 5.8G pull, +20,160 FPM ROD, throttles at maximum power. TAPROOM 51 was at 16,260' MSL, 119 KIAS, 35 degrees nose low, 140 degree right hand AOB. [Encls (2), (3), (4)]

132. MP would not regain sight of TAPROOM 51 for the remainder of this BFM set. [Encls (3), (4)]

133. 14:23:48L - TAPROOM 51 responded to TAPROOM 52's blind call, transmitted, "3000 feet above you, on your tail." TAPROOM 52 was at 10,260' MSL, 454 KIAS, 35 degrees nose up, 10 degree left hand AOB, 0.6G pull, +30,960 FPM ROD, throttles at maximum power. TAPROOM 51

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was at 15,280' MSL, 165 KIAS, 48 degrees nose low, 60 degree right hand AOB. [Encls (2), (3), (4)]

134. 14:23:55L - TAPROOM 52 rolled inverted and began a nose low maneuver. MP moved the throttles to full military power. TAPROOM 52 was at 14,010' MSL, 402 KIAS, 33 degrees nose up, wings level inverted, 1.8G pull, +29,520 FPM ROD, throttles at full military power. [Encl (2)]

135. 14:24:00L - TAPROOM 52 was nose low at 14,250' MSL, 296 KIAS, 65 degrees nose low, 6.0G pull, throttles at military power, -8150 FPM ROD, throttles at full military power. [Encl (2)]

136. 14:24:05L - TAPROOM 52 began a slight left hand pull towards the horizon. TAPROOM 52 was at 12,340' MSL, 214 KIAS, 24 degrees nose low, 10 degree left hand AOB, 3.6G pull, -22,790 FPM ROD, throttles at military power. [Encl (2)]

137. 14:24:08L - MP moved the throttles to maximum power. TAPROOM 52's throttles would remain at maximum power for the remainder of this set, until time 14:24:15L. [Encl (2)]

138. 14:24:10L - TAPROOM 52 queried "got me now?" MP responded with "sun" while executing a wings level pull towards the horizon. TAPROOM 52 was at 11,200' MSL, 168 KIAS, 8 degrees nose up, wings level, 1.8G pull, -4070 FPM ROD, throttles at maximum power. TAPROOM 51 was at 11,730' MSL, 385 KIAS, 5 degrees nose low, 3 degree left hand AOB. [Encls (2), (3), (4)]

139. 14:24:12L - TAPROOM 52 initiated a 110 degree right hand AOB to 20 degrees nose low. [Encl (2)]

140. 14:24:15L - TAPROOM 51 transmitted "knock it off." TAPROOM 52 was at 10,740' MSL, 200 KIAS, 20 degrees nose low, 90 degree right hand AOB. TAPROOM 51 was at 11,440' MSL, 400 KIAS, level, 80 degree left hand AOB. TAPROOM 51 directed TAPROOM 52 to turn 90 degrees to the right. [Encls (2), (3), (4)]

141. TAPROOM 52 lost 3,270 feet during the nose low maneuver. [Encl (2)]

142. 14:24:25L - TAPROOM 51 flowed out the right hand side of TAPROOM 52. TAPROOM 52 transmitted "visual." This is the first time TAPROOM 52 will have sight of TAPROOM 51 since transmitting "blind" at time 14:23:43L. [Encls (3), (4)]

143. 14:24:37L - TAPROOM 51 transmitted fuel and G checks with "10.2, good G." TAPROOM 52 responded with "11.2, good G", indicating TAPROOM 51 had 10,200 pounds of fuel and TAPROOM 51 had 11,200 pounds of fuel. [Encls (3), (4)]

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Third BFM Set

144. The Third High Aspect BFM PADS was a 14,000' MSL, 350 KIAS, 1.5 NM abeam Butterfly BFM set. TAPROOM 51 was on the right, TAPROOM 52 was on the left. [Encls (2), (3), (4), (6)]
145. 14:25:34L - TAPROOM 51 transmitted "speed and angels right." TAPROOM 52 immediately responded with "speed and angels left." TAPROOM 52 was at 13,790' MSL, 338 KIAS, 1.5 NM abeam [Encls (2), (3), (4)]
146. 14:25:39L - TAPROOM 51 and 52 took a turn away from each other to set up the fight. [Encls (2), (3), (4)]
147. 14:26:22L - TAPROOM 51 transmitted "turning in, visual, right-to-right." MP responded with "turning in, visual, right-to-right." [Encls (3), (4)]
148. 14:26:27L - TAPROOM 51 transmitted "fights on" 3.1 NM prior to the right-to-right merge. TAPROOM 51 was at 14,620' MSL, 455 KIAS, 3 degrees nose low, 90 degrees left hand AOB. TAPROOM 52 was at 14,220' MSL, 428 KIAS, level, 85 degree right hand AOB, MP moved the throttles to maximum power. [Encls (2), (3), (4)]
149. 14:26:35L - TAPROOM 52 took a simulated weapon employment shot and overbanked slightly nose low. TAPROOM 52 was at 13,040' MSL, 474 KIAS, 13 degrees nose low, 80 degree right hand AOB, 2.4G pull, throttles at maximum power. TAPROOM 51 was at 13,080' MSL, 511 KIAS, 24 degrees nose low, 90 degree left hand AOB. [Encls (2), (3), (4)]
150. 14:26:37L - MP moved the throttles to full military power. [Encl (2)]
151. 14:26:42L - Right-to-right merge occurred. TAPROOM 51 reversed to the right and pulled the nose to the horizon to start a nose high maneuver. TAPROOM 52 would continue in a slight nose low right hand turn while selecting maximum power. TAPROOM 52's throttles would remain at maximum power for the remainder of this set, time 15:28:00L. TAPROOM 52 was at 11,760' MSL, 505 KIAS, 10 degrees nose low, 85 degree right hand AOB, 4.8 G pull, throttles at maximum power. TAPROOM 51 was at 11,060' MSL, 505 KIAS, level, 10 degree right hand AOB. [Encls (2), (3), (4)]
152. 14:26:44L - TAPROOM 52 rolled wings level and began a nose high maneuver. TAPROOM 52 was at 11,480' MSL, 497 KIAS, level, 5.4 G pull, throttles at maximum power. [Encl (2)]
153. 14:26:50L - Both TAPROOM 51 and 52 continued in a nose high maneuver. TAPROOM 51 was rolling to the right. TAPROOM 52 was at 14,020' MSL, 390 KIAS, 75 degrees nose up, wings level, 6.6 G pull, throttles at maximum. TAPROOM 51 was at 15,210' MSL, 373 KIAS, 60 degrees nose up, 90 degree right hand AOB. [Encls (2), (3), (4)]

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154. 14:26:55 - TAPROOM 52 was inverted through the top portion of the nose high maneuver and began a right hand roll. TAPROOM 52 was at 17,190' MSL, 245 KIAS, 20 degrees nose up, 2.6 G pull, throttles at maximum power. [Encl (2)]

155. 14:26:59L - TAPROOM 51 transmitted "high" to set the high-low merge. TAPROOM 52 continued in a right hand roll to upright and responded with "low." TAPROOM 52 was at 17,180' MSL, 244 KIAS, 8 degrees nose up, 50 degree right hand AOB, throttles at maximum power. TAPROOM 51 was at 18,480' MSL, 266 KIAS, 10 degrees nose up, 160 degree right hand AOB. [Encls (2), (3), (4)]

156. 14:27:04L - At the high-low merge, TAPROOM 51 rolled inverted and executed a nose low maneuver. TAPROOM 52 began a left hand roll towards inverted. TAPROOM 52 was at 18,110' MSL, 266 KIAS, 4 degrees nose up, throttles at maximum power. TAPROOM 51 was at 18,900' MSL, 280 KIAS, inverted. [Encls (2), (3), (4)]

157. 14:27:14L - TAPROOM 51 was pulling the nose up towards the horizon following the nose low maneuver. TAPROOM 52 was pure nose low. TAPROOM 52 was at 16,580' MSL, 283 KIAS, 75 degrees nose low, 4.4 G pull, -33,110 FPM ROD, throttles at maximum power. [Encls (2), (3), (4)]

158. 14:27:21L - TAPROOM 52's nose reached the horizon in a descending left hand turn. TAPROOM 52 was at 13,650' MSL, 278 KIAS, level, 45 degree left hand AOB, 5.3 G pull, -9350 FPM ROD, throttles at maximum power. [Encl (2)]

159. 14:27:25L - TAPROOM 51 continued a nose high maneuver and began to turn to the left. TAPROOM 52 was in a slight nose low left hand turn. TAPROOM 52 was at 13,140' MSL, 205 KIAS, 8 degrees nose low, 100 degree left hand AOB, 3.2 G pull, -4550 FPM ROD, throttles at maximum power. TAPROOM 51 was at 14,440' MSL, 222 KIAS, 29 degrees nose up, 90 degree left hand AOB. [Encls (2), (3), (4)]

160. 14:27:46L - TAPROOM 51 pulled nose up and initiated a left hand turn. TAPROOM 52 was established in a slow descending left hand turn. TAPROOM 52 was at 11,680' MSL, 148 KIAS, 16 degrees nose up, 40 degree left hand AOB, 1.4 G pull, -470 FPM ROD, throttles at maximum power. TAPROOM 51 was at 12,960' MSL, 143 KIAS, 18 degrees nose up, 15 degree left hand turn. [Encls (2), (3), (4)]

161. 14:27:53L - TAPROOM 51 rolled left and initiated a nose low maneuver. TAPROOM 52 initiated a nose low maneuver to the left. TAPROOM 52 was at 11,780' MSL, 136 KIAS, 13 degrees nose up, 100 degree left hand AOB, 1.4 G pull, +720 FPM ROD, throttles at maximum power. TAPROOM 51 was at 11,920' MSL, 173 KIAS, 73 degrees nose low, 80 degree left hand AOB. [Encls (2), (3), (4)]

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162. 11:28:00L - TAPROOM 51 transmitted "knock it off." TAPROOM 51 rolled wings level as the nose reached the horizon. TAPROOM 52 was in a nose low maneuver rolling to the left. TAPROOM 52 was at 11,010' MSL, 179 KIAS, 73 degrees nose low, 2.4 G pull, -16,070 FPM ROD, throttles at maximum power. TAPROOM 51 was at 9880' MSL, 193 KIAS, level. [Encls (2), (3), (4)]

163. 14:28:18L - TAPROOM 51 transmitted fuel and G checks, "8.8, good G." TAPROOM 52 responded with "9.2, good G." [Encl (3), (4)]

Fourth BFM Set - Mishap Set

164. With 9200 pounds of fuel and a total aircraft gross weight of 43,310 pounds, G available for TAPROOM 52 was 7.34 Gs, as restricted by the aircraft's G-Limiter. The aircraft is also equipped with a G-Limiter Override activated by momentarily pressing the paddle switch on the front of the control stick when the control stick is near the full aft limit. The G-Limiter Override feature allows a 33% increase in command G-limit for emergency use, 10 Gs when the G-Limit is set at 7.5 Gs. [Encls (2), (61), (62)]

165. Additionally, the G-Limiter incorporates a G-Bucket designed to prevent an aircraft positive over-G during transonic deceleration due to an aerodynamic phenomenon known as transonic pitch-up. The maximum G reduction is 1.0 G above 20,000 feet and 1.7 G below 15,000 feet. For an aircraft configured with an Air-to-Ground store the G-Bucket is entered at 0.905 Mach, limiting G-available to 5.8 Gs. [Encls (8), (19), (62), (63)]

166. The fourth High Aspect BFM PADS was a 12,000' MSL, 350 KIAS, 2.0 NM Abeam BFM set. TAPROOM 51 was on the left, TAPROOM 52 was on the left. [Encls (2), (3), (4), (6)]

167. 14:29:33L - TAPROOM 51 transmitted "speed and angels left."
[Encls (3), (4)]

168. 14:29:36L - TAPROOM 52 responded "speed and angels right."
TAPROOM 52 was at 11,910' MSL, 380 KIAS, and 2.0 NM abeam. [Encls (2), (3), (4)]

169. TAPROOM 52 is 30 KIAS above the prescribed PADS airspeed. [Encl (2)]

170. 14:29:45L - TAPROOM 51 transmits "fights on." TAPROOM 51 and TAPROOM 52 immediately turned towards each other. TAPROOM 51 would start a right hand turn and lower the nose to 30 degrees nose low. TAPROOM 52 moved the throttles to maximum power and started a left hand turn from 12,080' MSL, 376 KIAS, and 2.0 NM abeam. [Encls (2), (3), (4)]

171. 14:29:47L - TAPROOM 52 overbanked in a left hand turn to lower the nose. TAPROOM 52 was at 12,100' MSL, 386 KIAS, 3 degrees nose

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low, 110 degree left hand AOB, 2.3 G pull, throttles at maximum power.
[Encl (2)]

172. 14:29:51L - TAPROOM 51 transmitted "left-to-left" to establish
the horizontal merge. [Encls (3), (4)]

173. 14:29:53L - At the merge TAPROOM 51 reversed to the left and
started a climbing left hand turn across TAPROOM 52's tail. TAPROOM
52 continued in a descending left hand turn across TAPROOM 51's tail.
TAPROOM 52 was at 11,270' MSL, 404 KIAS, 20 degrees nose low, 60
degree left hand AOB, 5.4 G pull, -15,590 FPM ROD, throttles at
maximum power. [Encls (2), (3), (4)]

174. 14:29:57L - TAPROOM 52's Barometric Altimeter (BAROALT) warning
system announced "Altitude, Altitude", indicating the MA had descended
below 10,000' MSL. TAPROOM 52 was stabilized in a descending left
hand turn and would initiate a nose low maneuver from 9,900' MSL, 468
KIAS, 15 degrees nose low, 80 degree left hand AOB, 5.5 G pull, 12,710
FPM ROD, 48.0 left rudder input (LRI), throttles are at maximum power.
TAPROOM 51 was continuing in a climbing left hand turn. [Encl (2),
(16)]

175. TAPROOM 52 initiated the nose low maneuver well above the TOPGUN
airspeed ROT for a nose low maneuver. [Encls (2), (60)]

176. Per TOPGUN Manual Chapter 40 - 1v1 Air Combat addresses stick and
throttle mechanics with regard to a nose low maneuver, "Realize if you
arrive at an airspeed greater than the rule of thumb (ROT), you may
arc, or even accelerate, during the nose low maneuver. Pay particular
attention to your fuel weight and aircraft configuration as you go
nose low at lower altitudes. A nose low load-limit maneuver with
airspeed in excess of 430 knots in slick FA-18E/F configuration may
actually require throttle and/or speedbrake modulation to bleed into
the rate band. It is not uncommon to accelerate uncontrollably once
committed nose low in a slick Super Hornet and the aircrew must be
aware of pre-merge energy states and proper body positioning for the
high G-load through the bottom of the turn. If excessively fast,
modulate throttles in the oblique to manage airspeed before committing
pure nose low. [Encl (64)]

177. 14:30:00L - TAPROOM 52 was established nose low while rolling
left at 8690' MSL, 498 KIAS, 55 degrees nose low, 10 degrees left hand
AOB, 7.5 G pull, -39,350 FPM ROD, 47.0 LRI, throttles are at maximum
power. [Encl (2)]

178. 14:30:01L - TAPROOM 51 continued in a climbing left hand turn.
TAPROOM 52 continued to roll left while executing the nose low
maneuver. TAPROOM 52 was at 8180' MSL, 507 KIAS, 70 degrees nose low,
7.6 G pull, -50,390 FPM ROD, 49.0 LRI, throttles are at maximum power.
[Encls (2), (3), (4)]

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179. 14:30:02L - TAPROOM 52 continued a rolling left, nose low maneuver at 7270' MSL, 523 KIAS, 75 degrees nose low, 7.4 G pull, -60,470 FPM ROD, 46.2 LRI, throttles are at maximum power. [Encl (2)]

180. 14:30:02.85L - TAPROOM 52 accelerated through 0.905 Mach. The aircraft's G-Limiter began to limit the G-available to 5.8 Gs per the G-Bucket restrictions. [Encls (2), (62), (63)]

181. 14:30:03L - TAPROOM 52's nose began to rise towards the horizon. TAPROOM 52 was at 6200' MSL, 542 KIAS 78 degrees nose low, 6.9 G pull, -56,870 FPM ROD, 44.1 LRI, throttles are at maximum power. [Encl (2)]

182. 14:30:04.3L - TAPROOM 52 descended through 5000' MSL. With the RADAR Altimeter (RADALT) warning system set to 5000' AGL, the MP was alerted the MA was descending below 5000' AGL. TAPROOM 52 was at 5000' MSL, 571 KIAS, 71 degrees nose low, 27 degrees left hand AOB, 5.9 G pull, -59,030 FPM ROD, 39.5 LRI, throttles are at maximum power. [Encl (2)]

183. 14:30:04.6L - MP began to bring the throttles back from maximum power to idle power. TAPROOM 52 was at 4740' MSL, 577 KIAS, 68 degrees nose low, 25 degree left hand AOB, 5.6 G pull, -47,990 FPM ROD, 40.2 LRI. [Encl (2)]

184. 14:30:05.55L - Throttles were at idle power. TAPROOM 52 was at 3980' MSL, 600 KIAS, 60 degrees nose low, 10 degree left hand AOB, 5.8 G pull, -47,990 FPM ROD, 47.0 LRI. [Encl (2)]

185. 14:30:06L - MP actuated the speedbrake switch. TAPROOM 52 was at 3490' MSL, 601 KIAS, 57 degrees nose low, 8 degree left hand AOB, 6.3 G pull, -65,750 FPM ROD, 47.0 LRI, throttles are at idle power. [Encls (2), (16)]

186. 14:30:06.1L - TAPROOM 52's control stick began to move forward. TAPROOM 52 was at 3420' MSL, 602 KIAS, 55 degrees nose low, 8 degree left hand AOB, 6.4 G pull, -65,750 FPM ROD, 44.2 LRI, throttles are at idle. [Encl (2)]

187. 14:30:06:55L - Last usable data recorded. TAPROOM 52's control stick was still moving forward towards the center point. TAPROOM 52 was at 2880' MSL, 604 KIAS, 46 degrees nose low, 10 degree left hand AOB, 5.7 G pull, -65,750 FPM ROD, 37.0 LRI, throttles are at idle. [Encls (2), (16)]

188. 14:30:07.3 - Last data record. Ejection occurred within 1.0 seconds of this point. [Encls (2), (16)]

189. 14:30:10L - MFL sees a puff of smoke come from TAPROOM 52 and queries the MP, "What do you got there?" TAPROOM 52 is inverted at 14,930' MSL, 234 KIAS, 10 degrees nose low. There is no response from the MP. [Encls (3), (4), (6)]

190. MFL will see the MA impact the water. [Encl (4), (6)]

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191. 14:30:21L - MFL will transmit on W-72 Warning 1 A/B common frequency, "mayday, mayday, mayday, aircraft in the water, 1A."
[Encls (3), (4)]

192. The four BFM sets lasted a total of 3 minutes 58 seconds combined. During the BFM sets full maximum power was selected by the MP for 3 minutes and 21 seconds, full military power for 34 seconds, and idle power for 3 seconds. [Encl (2)]

193. Per NATOPS, "During ejection seat development and testing, the SJU-17(V) 1/A, 2/A and 9/A NACES seats were qualified for use by aviators with nude weights from 136 to 213 pounds, while the SJU-17A(V) 1A, 2A, and 9/A NACES seats were qualified for use by aviators with nude body weights from 136 to 245 pounds." [Encl (65)]

194. The MP weighed 165 pounds 5.5 ounces at Norfolk Sentara General Hospital (NSGH) on 23 January 2014. [Encl (66)]

195. Per NATOPS, "1. Optimum speed for ejection is 250 KCAS and below. 2. Between 250 and 600 KCAS, appreciable forces are exerted on the body, making ejection more hazardous. 3. Above 600 KCAS, excessive forces are exerted on the body making ejection extremely hazardous."
[Encl (67)]

196. Per NATOPS, "Whenever possible, ejection airspeed should be limited to a maximum of 350 KCAS when flying with the JHMCS helmet system. WARNING - The JHMCS configuration can contribute to increased neck loads during ejection, particularly at moderate to high speeds. Generally, neck loads increase as ejection airspeed increases and may cause severe or fatal injury. Aircrews should eject at the lowest possible airspeed to minimize neck and injury loads. NOTE - Aircrew will brief system peculiarities and potential injury from out of position and high speed ejections prior to each flight when using A/A24A-56 JHMCS lightweight HGU-55 A/P helmet." The MA was at 604 KIAS at the time of ejection. [Encls (2), (67)]

197. A survey of the 17 VFA squadrons located at NAS Oceana was conducted to determine how many squadrons brief "peculiarities and potential injury from out of position and high speed ejections prior to each flight" when wearing the JHMCS. 11 of 17 squadrons responded. 10 of 11 squadrons (90%) responded they do not brief out of position JHMCS ejection contingencies. 1 of 11 (10%) replied they do brief out of position contingencies. 11 of 11 squadrons (100%) replied they do not brief high speed JHMCS ejection contingencies.
[Encl (52)]

198. MP did not remember the ejection sequence, water impact, time in the water, the search and rescue (SAR) event, flight to NSGH, or initial hours at NSGH. [Encls (5), (75)]

199. MP's helmet detached from the MP during the ejection sequence.
[Encl 12]

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200. The MP's dry suit was damaged during the ejection sequence. The neck seal was damaged, maybe by a small radius object(s) under load, repeatedly striking the latex. The left wrist may have been damaged by a very sharp object that may have penetrated the thick neoprene as well as the right wrist overcuff. Delaminated areas suggest the dry suit may have taken glancing impacts over the right inner upper thigh, right lower thigh, right knee cap, left elbow, and low abdomen. Black marks suggest the dry suit may have taken glancing impacts at the groin, left and right elbows, and left buttocks. Dark brown marks and delamination at the right pant hem suggest a heel strike. [Encl (12), (68)]

201. Additionally, the dry suit's relief zipper was open a 1/4". [Encl (68)]

202. The dry suit's thermal protection would have been degraded by water entering the suit through the opening in the relief zipper, broken neck seal, three delaminated areas, and/or a severance at the right elbow. [Encl (68)]

Search and Rescue

203. At the time of the mishap, there were two other sections of FA-18s working in the nearby area, ROMAN 21 and 22 from VFA-106 and PARTY 21 and 22 from Strike Fighter Squadron EIGHTY SEVEN (VFA-87). TAPROOM 61 was about to exit the W-72 Warning Area to the West and return to NAS Oceana. Additionally, USS THEODORE ROOSEVELT (CVN-71) was transiting into the W-72 Warning Area and was approximately 25 NM to the West of the impact site with HH-60H helicopters from Helicopter Antisubmarine Squadron ELEVEN (HS-11) onboard standing a 30 Minute Alert, USS OAK HILL (LSD-51) was 13 NM to the Northeast from the impact site, a civilian fishing vessel, the JOYCE D, was 2-4 NM to the East of the impact site, and BAY RAIDER 46 and 44 a section of MH-60S helicopters from Helicopter Sea Combat Squadron TWENTY EIGHT (HSC-28) had just taken off from NAS Norfolk heading South and were West of NAS Oceana. [Encls (6), (7), (9), (10), (11), (12), (13), (14), (15)]

204. At the "mayday" call from TAPROOM 51, ROMAN 21/22 and PARTY 21/22 ceased their training and looked to assist in the SAR effort. [Encls (9), (10)]

205. 14:30:50L - TAPROOM 51 attempted contact with the W-72 Warning Area controlling agency, GIANT KILLER. [Encls (3), (4)]

206. 14:31:14L - TAPROOM 51 contacted GIANT KILLER and transmitted "mayday, mayday, mayday, aircraft in the water, I have one chute." [Encls (3), (4)]

207. 14:31:30L - TAPROOM 51 passed the latitude and longitude coordinates of the impact site to GIANT KILLER and confirmed he saw one parachute. [Encls (3), (4)]

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208. ROMAN 21 and PARTY 21/22 quickly located the impact site via visual cues. ROMAN 21 spotted an oil slick in the water and PARTY 21/22 sighted a bright blue circle on the surface of the water with smoke rising from the center of the circle. The smoke quickly dissipated but the bright blue circle would remain throughout the SAR effort. [Encls (9), (10)]

209. 14:32:08L - PARTY 22 passed an updated latitude and longitude coordinate to GIANT KILLER. [Encls (3), (4), (10)]

210. ROMAN 21 spotted the USS THEODORE ROOSEVELT to the East of the impact sight and directed VFA-106 Base to contact the ROOSEVELT to assist in the SAR effort and pass the impact sight coordinates. [Encls (3), (4), (9)]

211. 14:33:29L - TAPROOM 51 transmitted "I have eyes on survivor and I think I have movement." [Encls (3), (4)]

212. 14:33:33L - PARTY 22 was directed to attempt contact with the JOYCE D. PARTY 22 switched one radio to Bridge-to-Bridge Channel 16 ('S' Mode on the ARC-210 radio) to attempt contact. [Encls (3), (4), (10)]

213. 14:33:39L - TAPROOM 61 passed impact site latitude and longitude coordinates to VFA-143 Base at NAS Oceana. [Encls (3), (4)]

214. 14:34:16L - TAPROOM 51 executed a fly-by near the JOYCE D and rocked wings in attempt to have the JOYCE D proceed towards the MP. [Encls (3), (4), (10)]

215. 14:35:03L - PARTY 22 reported visual the life raft. [Encls (3), (4)]

216. 14:35:53L - TAPROOM 51 executed another fly-by near the JOYCE D. [Encls (3), (4)]

217. 14:36:50L - TAPROOM 51 queried TAPROOM 61's fuel state. TAPROOM 61's fuel state was 6700 pounds. [Encls (3), (4)]

218. 14:37:20L - TAPROOM 51 reacquired visual on the parachute with the life raft in the middle of the parachute. [Encls (3), (4)]

219. 14:38:20L - TAPROOM 51 reported "I think I have movement in the raft." [Encls (3), (4)]

220. 14:38:28L - PARTY 22 reported movement in the raft to GIANT KILLER. [Encls (3), (4)]

221. 14:39:14: - PARTY 22 initiated a fuel state roll call. PARTY 22 was at 6800 pounds, PARTY 21 7100 pounds, TAPROOM 51 6400 pounds, and ROMAN 21 9000 pounds. (Note: Enclosure (10) listed TAPROOM 51's fuel

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state as 4.5 while tapes clearly show him to be at 6.4.) [Encls (3), (4), (10)]

222. Approximately 14:34:00 - HS-11 onboard USS THEODORE ROOSEVELT was alerted of the mishap and directed to launch the SAR helicopter, HS-11 #616. [Encl (11)]

223. Approximately at the same time, USS OAK HILL was alerted to the mishap. It began proceeding to the impact sight. It would take approximately 40 minutes for the OAK HILL to arrive on scene. [Encl (14)]

224. TAPROOM 51, TAPROOM 61, ROMAN21, and PARTY 21/22 established a stack over the impact site. TAPROOM 51 was 2000' MSL and below, TAPROOM 61 was at 3000' MSL, PARTY 21/22 established themselves between 6000' and 8000' MSL, and ROMAN 21 proceeded to 20,000' MSL. [Encls (3), (4), (7), (9), (10)]

225. Approximately at the same time, BAY RAIDER 46/44 from HSC-28 were queried from NAS Norfolk Tower and asked if they were SAR capable. They responded in the affirmative and were directed to contact NAS Oceana Tower. [Encls (12), (13), (15)]

226. NAS Norfolk Tower contacted BAY RAIDER 46/44 on Guard frequency approximately one minute later and passed the impact site latitude and longitude coordinates. The flight was cleared by NAS Oceana Approach through NAS Oceana airspace and given updated latitude and longitude coordinates and a TACAN cut off NAS Oceana to the impact site. BAY RAIDER 46/44 proceeded towards the impact site. [Encls (12), (13), (15)]

227. 14:40:05L - ROMAN 21 queried VFA-106 Base about the possibility of launching an air-to-air tanker configured aircraft. [Encls (3), (4), (9)]

228. 14:43:30L - TAPROOM 51 reported MP was not in the raft, LPU was inflated, and MP was positioned 100 meters North/Northwest of the impact site fuel/oil slick. [Encls (3), (4)]

229. 14:45:18L - PARTY 22 reported he had established communications with the JOYCE D and reported a Coast Guard helicopter was inbound. The JOYCE D began a turn towards the MP. [Encls (3), (4), (10)]

230. 14:46:07L - VFA-106 base reported the USS THEODORE ROOSEVELT was preparing to launch a SAR helicopter. [Encls (3), (4), (9)]

231. 14:47:55 - TAPROOM 51 attempted to contact the MP on 254.0, Guard frequency. The Emergency Locator Transmitter (ELT) was broadcasting over Guard. There was no response from the MP. [Encls (3), (4)]

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232. 14:48:58L - TAPROOM 51 passed a 30 degree left heading direction to the JOYCE D via PARTY 22. The JOYCE D was reported as 500 meters from the MP. [Encls (3), (4), (10)]

233. 14:52:45L - TAPROOM 51 reported the JOYCE D 100-150 meters away from the MP. [Encls (3), (4)]

234. 14:53:30L - TAPROOM 51 flew down the side of the JOYCE D in attempt to point towards the MP's location. [Encls (3), (4)]

235. 14:54:45L - PARTY 22 reported the USS THEODORE ROOSEVELT had not launched the SAR helicopter and instructed the JOYCE D to rescue the MP. [Encls (3), (4), (10)]

236. TAPROOM 51 and PARTY 22 lost sight of the survivor on multiple occasions due to the black and green coloring of the survival gear. Both aircraft would use the light blue coloring of the water at the impact site to relocate the MP. [Encls (3), (4), (10)]

237. 14:56:50L - TAPROOM 51 instructed PARTY 22 to direct the JOYCE D to check the condition of the MP prior to pulling the MP out of the water in order to not cause potential further injury to the MP. [Encls (3), (4)]

238. 14:57:15L - TAPROOM 51 directs JOYCE D right 45 degrees via PARTY 22. JOYCE D was 75 meters from the MP. [Encls (3), (4)]

239. 14:57:55L - TAPROOM 51 turned towards TAPROOM 61 to conduct air-to-air tanking. [Encls (3), (4), (6), (7)]

240. 14:58:50L - TAPROOM 51 was plugged with TAPROOM 61 and receiving fuel. [Encls (3), (4)]

241. 14:59:35L - TAPROOM 51 was complete tanking, fuel state 4400 pounds. TAPROOM 61 returned to NAS Oceana. [Encls (3), (4), (7)]

242. Approximately 15:00:00L, HS-11 #616 onboard USS THEODORE ROOSEVELT lifted from the flight deck and proceeded towards the impact site. [Encl (11)]

243. 15:01:30L - JOYCE D reported by TAPROOM 51 as 40 meters from MP. [Encls (3), (4)]

244. 15:03:42L - PARTY 22 switched radio frequency to establish communications with HS-11 #616. [Encls (3), (4), (10)]

245. 15:04:54L - AMBUSH 31-34, four FA-18s from Strike Fighter Composite Squadron TWELVE (VFC-12) based at NAS Oceana checked in with GIANT KILLER and were directed to W-72 Warning Area 1 C/D East of the impact site. [Encls (3), (4), (6)]

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246. 15:07:30L - TAPROOM 51 contacted AMBUSH 31 and passed the MP's latitude and longitude coordinates and directed AMBUSH 31 to proceed towards those coordinates to assume the role of the On Scene Commander (OSC). Additionally, TAPROOM 51 reported the MP was 15 feet off the bow of the JOYCE D. [Encls (3), (4)]

247. 15:09:40L - AMBUSH 31 reported visual JOYCE D and TAPROOM 51. [Encls (3), (4)]

248. 15:11:00L - TAPROOM 51 departed to the West and returned to NAS Oceana due to low fuel. [Encls (3), (4)]

249. 15:11:10L - AMBUSH 31 reported visual HS-11 #616. [Encls (3), (4)]

250. 15:11:32L - AMBUSH 31 reported visual the MP's parachute. [Encls (3), (4)]

251. 15:11:50L - AMBUSH 31 assumed OSC. [Encls (3), (4)]

252. 15:12:00L - PARTY 22 departed to the West and returned to NAS Oceana. [Encl (10)]

253. At 8 NM from the impact sight, HS-11 #616 established visual contact with the JOYCE D. [Encl (11)]

254. The JOYCE D attempted to throw a survival ring to the MP several times, and reported the MP was unable to grab the ring, was asking for help, and was having trouble breathing. [Encl (9)]

255. Approximately 15:12:00L - HS-11 #616 arrived on scene and located the MP alongside the JOYCE D. [Encl (11)]

256. As BAY RAIDER 46/44 entered the W-72 Warning Area from the West, they spotted HS-11 #616 out in front and proceeding in the same direction. BAY RAIDER 46 queried GIANT KILLER if there were other SAR helicopters proceeding to the impact site. GIANT KILLER responded negative. [Encls (12), (13), (15)]

257. BAY RAIDER 46/44 attempted to contact HS-11 #616 on multiple frequencies and was unable to establish communications with HS-11 #616 throughout the SAR effort. [Encls (11), (12), (13), (15)]

258. Also at this time, USS OAK HILL arrived on scene and deployed a rigid-hulled inflatable boat (RHIB) with a SAR swimmer aboard. USS OAK HILL saw HS-11 #616 near the JOYCE D and elected to have the RHIB loiter away from the JOYCE D, monitor the situation, and react if needed. [Encl (14)]

259. Approximately 15:14:00L - BAY RAIDER 46/44 arrived on scene, saw HS-11 #616 in the process of executing a rescue attempt, and elected to orbit the area to monitor the situation and support HS-11 #616 if needed. [Encls (12), (13), (15)]

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260. HS-11 #616 established a hover a half rotor diameter away from the MP to deploy the SAR swimmer. [Encl (11)]

261. Once the HS-11 SAR swimmer was in the water, the JOYCE D began to move away from the MP. [Encl (11)]

262. The HS-11 SAR swimmer swam past the now drifting MP by 15 feet towards the JOYCE D, assuming the MP was still alongside the JOYCE D. [Encl (11)]

263. At this time, BAY RAIDER 46 noticed a floating object near a submerged parachute. BAY RAIDER 46 positively identified the MP visually and via their Multi-Spectral Targeting System (MTS). [Encls (12), (13), (15)]

264. The MP appeared to be floating with his face out of the water, LPU inflated, helmet not on the MP's head, and not attempting to signal the helicopters. [Encls (12), (13), (15)]

265. At this point, BAY RAIDER 46/44 and HS-11 #616 were approximately 300 yards from each other. BAY RAIDER 46 called the MP in sight to BAY RAIDER 44 and entered a hover near the MP to deploy their SAR swimmer. [Encls (12), (13), (15)]

266. During this period HS-11 #616 was attempting to get its' SAR swimmer pointed away from the JOYCE D and back towards the MP. [Encl (11)]

267. When the HS-11 SAR swimmer reached the JOYCE D its' crewmembers directed the SAR swimmer back towards the MP. [Encl (11)]

268. HS-11 #616 made a right hand turn back towards the MP. During the turn HS-11 #616 visually acquired BAY RAIDER 46 in a hover over the MP location. HS-11 #616 remained 2-3 rotor diameters from BAY RAIDER 46 and remained on station to support the recovery effort. [Encl (11)]

269. The HS-11 SAR swimmer closed to within 50 feet of the MP and elected to maintain the 50 foot stand-off when BAY RAIDER 46 began to deploy their SAR swimmer. [Encl (11)]

270. BAY RAIDER 46 entered a hover 1 rotor diameter downwind from the MP and began to lower their SAR swimmer down the wire. [Encls (12), (13)]

271. BAY RAIDER 46 SAR swimmer entered the water at the survivor's location via direct deployment. [Encls (12), (13), (15)]

272. BAY RAIDER 46 SAR swimmer noted the MP was still connected to the seat pan and parachute. [Encls (12), (15)]

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273. BAY RAIDER 46 SAR swimmer determined the MP was conscious but unable to move. [Encls (12), (15)]

274. BAY RAIDER 46 SAR swimmer executed disentanglement procedures and attached the MP to the Quick Strop for extraction. [Encls (12), (15)]

275. Approximately 15:25:00L, the MP and BAY RAIDER 46 SAR swimmer were lifted in one hoist. The MP was in the water for approximately 55 minutes. [Encls (2), (12), (15)]

276. Once in the cabin, the BAY RAIDER 46 Crew Chief secured the rescue station and cleared BAY RAIDER 46 for forward flight. [Encl (12)]

277. BAY RAIDER 46 exited hover and proceeded West towards NSGH. [Encls (12), (15)]

278. BAY RAIDER 46 crewman assessed the MP as suffering from hypothermia, broken arms, bruising to the head and face, and possible concussion. The MP was in and out of consciousness asking for help and flailing about. [Encls (12), (15)]

279. With the extraction of the MP, HS-11 #616 recovered their SAR swimmer and returned to USS THEODORE ROOSEVELT. [Encl (11)]

280. AMBUSH 01-04 exited the area to the East. [Encl (9)]

281. ROMAN 21 thought he heard BAY RAIDER 46 transmit it was heading to USS THEODORE ROOSEVELT. [Encl (9)]

282. ROMAN 21 passed MP status and destination to VFA-106 and VFA-143 base. [Encl (9)]

283. ROMAN 21 observed BAY RAIDER 46/44 fly past USS THEODORE ROOSEVELT. [Encl (9)]

284. ROMAN 21 contacted BAY RAIDER 44 who reported MP was in critical condition, proceeding to NSGH and requested assistance in contacting NSGH to relay BAY RAIDER 46 was inbound and pass assessed injuries. [Encl (9), (15)]

285. BAY RAIDER 46 passed to ROMAN 21 the MP was assessed to have ejection injuries, difficulty breathing, hypothermia, and possible head trauma. [Encl (9), (15)]

286. ROMAN 21 instructed VFA-106 bases to contact NSGH and have a head trauma crew on standby. [Encl (9)]

287. MP's status was updated several times between BAY RAIDER 44, ROMAN 21, VFA-106 base, and NSGH. [Encl (9), (15)]

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288. BAY RAIDER 44 reported the flight was seven minutes from NSGH, ROMAN 21 reported a final update of the MP to VFA-106 and VFA-143 base and returned to NAS Oceana. [Encl (9)]

289. Approximately 15:55:00L, BAY RAIDER 46 arrived at NSGH. A hospital trauma crew was on station and the MP was transferred to NSGH without complication. [Encls (12), (15)]

290. USS OAK HILL remained on scene and collected debris. The OAK HILL visually identified and recovered the DFIRS. [Encl (14)]

IV. POST-MISHAP STATUS OF MP

291. (b)(6)

(b)(6)

292. The MP had no indicators of alcohol use or intoxication at the time of the mishap. [Encl (66)]

293. A possible number (b)(6) issues (b)(6)
a (b)(6) but none were raised by
the MP to the chain-of-command or flight leads prior to the MF. (b)(6)

(b)(6)

5. The MP again stated he was of "clear mind" the day of the mishap and there were (b)(6), which is why he did not raise any ORM issues during the mishap flight brief. The chain-of-command was unaware of the details of this situation. [Encl (6), (7), (30), (31), (36), (69), (70)]

V. CLOSING NOTES

294. Post flight simulation determined if the MP had continued with a 7.5 G pull with the throttles at idle, the MA would have reached a low altitude of 610' AGL. If the MP had pulled the G Override Paddle Switch, located on the control stick, and performed a maximum G pull

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with the throttles at idle, the MA would have reached a low altitude of 1430' AGL. [Encl (71)]

295. The total cost of the FA-18F Super Hornet aircraft BUNO #166603 and equipment lost is \$84,900,000.00. [Encl (72)]

296. According to the Manual of the Judge Advocate General (JAGMAN), "Injury or disease incurred by Naval personnel while in active service, and death incurred by Naval personnel on active duty, will be considered to have been incurred "in line of duty" except when incurred under one or more of the following circumstances:

- (1) as a result of the member's own misconduct as determined under the regulations contained in this chapter;
- (2) while avoiding duty by deserting;
- (3) while absent without leave and such absence materially interfered with the performance of required military duties;
- (4) while confined under a sentence of court-martial that included an unremitted dishonorable discharge; or
- (5) while confined under a sentence of a civil court following a conviction of an offense that is defined as a felony by the law of the jurisdiction where convicted." [Encl (73)]

297. According to the JAGMAN, misconduct is defined as "An injury or disease is the result of a member's misconduct if it is either intentionally incurred or is the result of willful neglect that demonstrates a reckless disregard for the foreseeable and likely consequences of the conduct involved. It is more than just inappropriate behavior." Additionally, "An injury, disease, or death suffered by a member of the Naval service is presumed to have been incurred in the line of duty and not to be the result of misconduct. Clear and convincing evidence is required to overcome this presumption." [Encl (74)]

Opinions

1. The MP's failure to execute normal High Aspect BFM mission cross check scan of the MA's altitude, airspeed, and rate of descent and execute basic High Aspect BFM stick and throttle mechanics for a nose low maneuver led directly to the loss of the aircraft. If the MP had executed a normal mission cross check scan and High Aspect BFM maneuvers per established Tactics, Techniques, and Procedures (TTPs), there would not have been a mishap. This primary causal factor, along with the contributing factors of the MP's lack of proficiency in executing High Aspect BFM flights, lack of proficiency in wearing and employing the Joint Helmet Mounted Cueing System (JHMCS), and a flight brief that lacked the substance and depth to mitigate the ORM associated with the MF all combined to contribute to this mishap. [FOFs 16), (17), (18), (29), (31), (32), (33), (34), (46), (47), (49), (52), (53), (55), (59), (72), (90), (125), (126), (130), (174), (175), (176), (177), (178), (179), (180), (181), (182), (183), (184), (185), (186), (192)]

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2. The MP failed to recognize the altitude (9900' MSL) and airspeed (468 KIAS) at which he initiated the mishap nose low maneuver. In particular, the MP failed to recognize the airspeed, which greatly exceeded the TOPGUN airspeed ROT for a nose low maneuver. [FOFs (174), (175), (176), (177), (178), (179), (180), (181), (182), (184), (185), (186)]

3. The MP failed to execute proper stick and throttle mechanics for a nose low maneuver executed at 9900' MSL and 468 KIAS. The MP did not modulate the throttles from maximum power until the RADALT alerted the MP the aircraft was rapidly descending below 5000' AGL. With the throttles at maximum power, the airspeed rapidly increased, thus causing the aircraft to arc, increasing the aircraft's turn radius and altitude lost. [FOFs (174), (175), (176), (177), (178), (179), (180), (181), (182), (184), (185), (186)]

4. From time 14:29:57L when the MP initiated the mishap nose low maneuver until time 14:30:04.6L, when the MP began to move the throttles towards idle power, the MP failed to execute "normal mission cross check times and visual lookout doctrine for the operating flight environment" to avoid display fixation and compromising situational awareness, per the JHMCS SOP. There are no Findings of Fact that indicate the MP was aware of the rapidly increasing airspeed or rapid rate of descent until the MA descends below 5000' AGL. [FOFs (174), (175), (176), (177), (178), (179), (180), (181), (182), (184), (185), (186)]

5. The MP lost situational awareness by a combination of focusing on maintaining sight of TAPROOM 51 and a slow or non-existent normal mission cross check scan via the JHMCS or the aircraft's Heads Up Display (HUD). [FOFs (42), (174), (177), (178), (179), (180), (181), (182), (184), (185), (186)]

6. The MP lost sight of TAPROOM 51 on the Second BFM set while executing a similar high-speed, nose low maneuver and called "blind" to inform the MFL he had lost sight. It is reasonable to assume the MP did not want to make the same mistake during the mishap nose low maneuver. The MP would have been focused on not losing sight of TAPROOM 51 and not maintaining normal mission cross check scan. TAPROOM 51 was in a climbing left hand turn as the MP initiated the mishap nose low maneuver. The MP would have been looking up and left through the JHMCS to try and maintain sight of TAPROOM 51. Additionally, the MP had inputted left hand rudder to roll the MA to the left, indicating the MP was maneuvering the MA to maintain sight of TAPROOM 51 above and turning to the MP's left. The MP did not transmit "blind", as the MP did during the Second BFM set, at any point during the mishap nose low maneuver. [FOFs (131), (133), (177), (178), (179), (180), (181), (182), (184), (185), (186)]

7. While the JHMCS does display airspeed and altitude in the Air-to-Air Mode, it does not display attitude reference. Looking through the JHMCS, the MP would not have been able to discern how many degrees

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nose low the MA was with rapidly increasing airspeed and decreasing altitude. The MP's inexperience and lack of proficiency with the JHMCS and High Aspect BFM led to a slow or non-existent mission cross check time of the JHMCS displayed airspeed and altitude or a normal attitude, airspeed, and altitude mission cross check via the aircraft's HUD. This is evident in the two high-speed, nose low maneuvers executed by the MP during the Second BFM set and the Mishap BFM set. During the Second BFM set, the MP initiated a nose low maneuver from 13,140' MSL, 440 KIAS, again, above the TOPGUN ROT airspeed, and at maximum power. The MP did not modulate the throttles with a rapidly increasing airspeed and loss of altitude. The MA will bottom out at 7500' MSL and 513 KIAS. Given the higher fuel weight of the aircraft during the Second BFM set and the altitude initiated, the MA will not accelerate as rapidly or lose as much altitude as during the mishap nose low maneuver. These two high-speed, nose low maneuvers indicate the MP was not properly scanning airspeed and altitude via the JHMCS or a normal mission cross check of the HUD and did not execute High Aspect BFM per established TTPs. This led to a loss of situational awareness and is a direct reflection of the MP's proficiency and capabilities with the JHMCS and High Aspect BFM execution. [FOFs (16), (17), (18), (29), (31), (32), (33), (34), (46), (47), (49), (52), (53), (55), (59), (72), (90), (125), (126), (130), (174), (175), (176), (177), (178), (179), (180), (181), (182), (183), (184), (185), (186), (192)]

8. The JHMCS Familiarization Flight Two does not adequately expose the JHMCS Trainee to High Aspect BFM nose low initial merge maneuver. The flight does not require the JHMCS Trainee to perform a nose low maneuver at the initial merge. This does not allow the JHMCS Trainee to perform the nose low maneuver for the first time with the JHMCS in a controlled scenario. This lack of exposure to and experience with this maneuver, while employing the JHMCS, contributed to the MP's slow or non-existent mission cross check and loss of situational awareness. [FOFs (50), (51)]

9. There are no Findings of Fact that indicate the MP experienced a "gray out" or "black out" physiological event due to high Gs. The MP executed a near maximum G pull during the mishap nose low maneuver. There was no easing of G until the aircraft's G-Limiter restricted the G-available to 5.8 Gs per the G-Bucket restrictions. The MP moved the throttle to idle at 4740' AGL, indicating he had become aware and was reacting to the rapidly increasing airspeed and rate of descent. The MP actuated the speed brake switch just prior to ejection; again, evidence the MP was cognizant of and reacting to the deteriorating situation. The control stick did not move forward until within the last second prior to ejection, indicating the MP had released the control stick in order to pull the ejection handle. [FOFs (100), (101), (177), (180), (181), (182), (183), (184), (185), (186), (187), (188), (189), (190)]

10. The MP was current to execute High Aspect BFM and the MFL was briefed to requirements to execute High Aspect BFM per OPNAV

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INSTRUCTION 3710.7U. However, while important to recognize and discuss aircrew proficiency during the ORM portion of the flight brief, it is another thing to carry that knowledge into the flight execution portion of the brief and the flight. The MFL did recognize and discuss the MP's lack of proficiency, but failed to brief the detail and substance required to mitigate this ORM issue to safely and properly execute this High Aspect BFM flight given the MP's lack of proficiency and experience in executing High Aspect BFM while employing the JHMCS. [FOFs (72), (77), (88)]

11. The MFL briefed all the required items per OPNAV Instruction 3710.7U and NATOPS to execute High Aspect BFM. However, given the MP's proficiency and experience level with High Aspect BFM and wearing and employing the JHMCS, the MFL failed to brief this flight to the proper level of detail and substance. [FOFs (16), (17), (18), (29), (31), (33), (34), (47), (49), (69), (73), (74), (77), (86), (87), (88), (90)]

12. The MF was not scheduled and executed under a formal training syllabus and the MP was not thoroughly briefed on the conduct of the flight per OPNAV INSTRUCTION 3710.7U. If the flight had been scheduled under a formal training syllabus, for example, the SFWT Syllabus Flight 2.3 - High Aspect BFM, this, more than likely, would have driven the MFL to execute a flight brief that contained the proper level of depth and substance with regard to High Aspect BFM execution to safely execute the flight and would have aligned the MF, particularly the PADS, with the SFWT syllabus. [FOFs (61), (69), (73), (77), (79), (83), (88)]

13. Given the dynamic nature of High Aspect BFM and the proficiency and experience level of the MP (the MP had not flown a formal SFWT Syllabus BFM flight since 25 October 2013 and not a formal High Aspect BFM Syllabus flight since being a student at VFA-106 in February 2013) the SFWT Syllabus Flight 2.3 - High Aspect BFM, should have been scheduled, briefed, and executed. This would have aligned the MF with OPNAV Instruction 3710.7U to conduct BFM as part of "formal training syllabus" and would have ensured the MP was "thoroughly briefed on the conduct of the flight." At a minimum, the brief should have addressed High Aspect BFM nose high, nose low, and level gameplans, proper stick and throttle mechanics while executing these BFM gameplans, TOPGUN airspeed ROTs for a nose high, nose low, and level maneuver, JHMCS employment considerations, and PADS aligned with the SFWT Syllabus. [FOFs (16), (17), (18), (29), (31), (33), (34), (47), (49), (69), (73), (74), (77), (86), (87), (88), (90)]

14. With regard to personal human factors, it is the responsibility of each Naval Aviator to constantly and thoroughly evaluate their own personal human factors. Every aviator is different in their ability to manage and compartmentalize personal human factor issues. If a human factor issue leads to a loss of preparation, focus, or execution, a Naval Aviator must notify his/her chain-of-command. Naval Aviation has developed a culture for aviators, without

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prejudice, to bring forward human factor issues on each and every flight. The MP had brought forward personal human factor issues in the past. The MP was afforded the opportunity to bring forward any human factor issues and elected not to raise any personal human factor issues prior to the MF. Only the MP knows if personal human factors contributed to his focus, preparation, or execution of the MF and played a role in this mishap. [FOFs (19), (20), (21), (25), (26), (72), (293)]

15. The Commanding Officer did foster a climate in which aviators were encouraged to bring forward human factor issues and the command took steps to address human factor issues. This is evident in the fact the MP was able to bring forward his personal ORM issues in November and December and the command took steps to allow the MP to deal with those personal ORM issues. [FOFs (19), (20), (26)]

16. JHMCS regulations, SOP, and training rules are addressed in three different documents, JHMCS SOP, NATOPS, and OPNAV INSTRUCTION 3710.7U. This diversion of JHMCS related material has led to a lack of standardization, training syllabus accountability, and employment complacency. [FOFs (40), (41), (42), (43), (196)]

17. The JHMCS ORM Matrix, incorrectly, does not list under the "Mission Task" section of the matrix, "JHMCS Display Fixation" and "Mission Cross Check Times." As a result the JHMCS ORM Matrix does not adequately address the "Hazards" and "Mitigations" associated with display fixation and mission cross check times. [FOFs (41), (42)]

18. VFA squadrons as a whole are not aware of all required JHMCS qualification standards, specifically the requirement to complete the JHMCS Interactive Courseware, and are not qualifying JHMCS Trainees per the JHMCS SOP. [FOFs (43), (44)]

19. VFA squadrons as a whole are not briefing JHMCS high speed and body position ejection considerations per NATOPS. [FOFs (196), (197)]

20. The SAR effort was complicated by a lack of a W-72 Warning Area SAR SOP, specifically when it came to radio frequencies and communications. BAY RAIDER 46/44 initially was unable to communicate with any other SAR asset, until ROMAN 21 was able to establish communications with BAY RAIDER 46/44 while transiting to NSGH. BAY RAIDER 46/44 was unable to communicate with HS-11 #616 at any point during the SAR effort. [FOFs (256), (257)]

21. The MP's injuries were inflicted by the high-speed ejection. [FOFs (193), (194), (195), (291)]

22. There are no FOFs that meet the JAGMAN criteria to find the MP's injuries were sustained not in the line of duty or due to misconduct. Therefore, the MP's injuries were sustained in the line of duty and not due to misconduct. [FOFs (14), (21), (22), (24), (25), (26),

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(27), (49), (60), (70), (72), (73), (74), (90), (193), (194), (195),
(196), (200), (201), (202), (291), (292), (293), (296), (297)]

23. Crew day and crew request requirements were met for the preceding
24 hours. [FOFs (22), (23), (24), (66)]

Recommendations

1. The facts of this mishap and the Safety Investigation Report should be briefed to all Hornet, Super Hornet, and Growler squadrons to raise their situational awareness on proficiency versus currency, JHMCS employment, fundamentals of BFM execution, appropriate level of BFM flight briefing, and the lessons learned in employing the FA-18A-G models. [Opinions (1), (2), (3), (4), (5), (6), (7), (8), (9), (10), (11), (12), (13), (14), (17), (18)]

2.

(b)(5)

3.

(b)(5)

4. Commanding Officers should continually evaluate aircrew proficiency versus currency and establish High Aspect BFM briefing and execution guidelines based on aircrew experience and assessed proficiency, to include days since last High Aspect BFM flight, nose high, nose low, and level ROT airspeeds, stick and throttle mechanics, BFM gameplan execution, and PADS. [Opinions (7), (8), (10), (11), (12), (13)]

5. Commanding Officers should continually foster a climate where human factor issues can be raised and addressed, without prejudice, for the safety of all. [Opinions (14), (15)]

6. A copy of this investigation should be forwarded to Commanding Officer, VFA-122, the FA-18E/F Model Manager, with a recommendation that the NATOPs required JHMCS ejection considerations briefing note be amended to be an annual requirement in alignment with the required annual aircrew ejection seat training. [Opinion (19)]

7.

(b)(5)

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8. CSFWP and CSFWL should distribute the latest version of the JHMCS Interactive Courseware to all VFA squadrons to ensure JHMCS qualifications are in line with the JHMCS Ground Training Syllabus outlined by the JHMCS SOP. [Opinion (18)]

9. CSFWP and CSFWL should amend the JHMCS Training Rules to add, "To avoid display fixation, normal mission cross check times and visual lookout doctrine for the operating flight environment (i.e, low level, formation, Air Intercept Control (AIC), Air Combat Maneuvering (ACM), etc) shall be used. The JHMCS shall be blanked if the added symbology and/or display fixation begins to compromise situational awareness." [Opinion (17)]

10. CSFWP and CSFWL should amend the JHMCS ORM Matrix with regard to the ACM Mission Task's ORM Hazards/Risks to add, "Display Fixation" and "Mission Cross Check Times." [Opinion (17)]

11. CSFWP and CSFWL should amend the JHMCS ORM Matrix with regard to the ACM Mission Task's ORM Mitigation to add, "Normal mission cross check times and visual lookout doctrine for the operating flight environment (i.e, low level, formation, Air Intercept Control (AIC), Air Combat Maneuvering (ACM), etc.) shall be used. The JHMCS shall be blanked if the added symbology and/or display fixation begins to compromise situational awareness." [Opinion (17)]

(b)(5)

/s/

(b)(6)