



UNITED STATES MARINE CORPS

COMMAND ELEMENT
II MARINE EXPEDITIONARY FORCE
PSC BOX 20080
CAMP LEJEUNE, NC 28542-0080

IN REPLY REFER TO:

5830

SJA

JUL 26 2012

THIRD ENDORSEMENT on (b)(3), (b)(6), (b)(7)c InvestRpt Legal 5800 dtd
24 Jun 2012

From: Commanding General, II Marine Expeditionary Force
To: File

Subj: COMMAND INVESTIGATION INTO THE FACTS AND CIRCUMSTANCES
SURROUNDING THE CLASS "A" MISHAP INVOLVING THE MV-22B
CRASH THAT OCCURRED NEAR CAP DRA'A MOROCCO ON 11 APRIL
2012

1. Reviewed and retained. This case is closed and no further investigation is required.
2. Subject to the following, the findings of fact, opinions, and recommendations of the Investigating Officer, as modified by the Commanding General, 2d Marine Aircraft Wing, are approved.
3. Opinion 1 is modified to state: "That pursuant to OPNAVINST 3750.6R this is a Class "A" aviation mishap because a DoD aircraft was involved where the intent for flight existed and the mishap resulted in the death of two service members."
4. I specifically approve the findings that:
 - a. The injuries of (b)(3), (b)(6), (b)(7)c were incurred in the line of duty, and were not due to misconduct. I further find that his injuries are not the result of intentional or willful neglect, and were not incurred during a period of unauthorized absence.
 - b. The injuries of (b)(3), (b)(6), (b)(7)c were incurred in the line of duty, and were not due to misconduct. I further find that his injuries are not the result of intentional or willful neglect, and were not incurred during a period of unauthorized absence.
 - c. The death of Corporal Robby A. Reyes occurred in the line of duty, and was not due to misconduct.

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d. The death of Corporal Derek A. Kerns occurred in the
line of duty, and was not due to misconduct.

5. The Commanding Officer, 24th Marine Expeditionary Unit,
shall ensure that appropriate entries are made into the medical
records of these Marines in accordance with the findings above.

6. In addition, complete copies of this investigation shall be
forwarded to the Deputy Commandant for Aviation and the
Commander, U.S. Marine Corps Forces Command, for review and
consideration of the approved recommendations.

7. I offer my sincere condolences to the families of Corporal
Reyes and Corporal Kerns. They were truly magnificent Marines
and their loss is felt by the entire II MEF family.

8. I also wish for a speedy recovery of the injured Marines,
and look forward to their return to service.


R. C. FOX

Copy to:
DCA
CMC (MMSR-6)
COMMARFORCOM
COMMARFORPAC
CG, 2d MAW
CDR, 6th Fleet
CO, 24th MEU
File



UNITED STATES MARINE CORPS
2D MARINE AIRCRAFT WING
II MARINE EXPEDITIONARY FORCE
POSTAL SERVICE CENTER BOX 8050
CHERRY POINT, NC 28533-0050

IN REPLY REFER TO:
5830
SJA

SECOND ENDORSEMENT on (b)(3), (b)(6), (b)(7)c InvestRpt Legal 5800 dtd 24 Jun 2012

From: Commanding General, 2d Marine Aircraft Wing
To: Commandant of the Marine Corps (DC Aviation)
Via: (1) Commanding General, II Marine Expeditionary Force
(2) Commanding General, Marine Corps Forces Command

Subj: COMMAND INVESTIGATION INTO THE FACTS AND CIRCUMSTANCES SURROUNDING
THE CLASS "A" MISHAP INVOLVING THE MV-22B CRASH THAT OCCURRED NEAR
CAP DRA'A MOROCCO ON 11 APRIL 2012

1. I have reviewed subject investigation and concur with the findings of fact. It is a very thorough and comprehensive investigation.

2. I recommend the following change to opinion 16:

16. The mishap aircraft co-pilot failed to adjust nacelles aft during the pedal turn, preventing him from having enough aft cyclic stick control margin to overcome the effects of a nose down attitude and transitioning to aircraft mode with a significant tailwind.

3. I would like to emphasize recommendation 5, which addresses the crew chiefs not being strapped to their seats for takeoff. A major push must be made in the rotary wing community for all crewmembers to be strapped to their seats when not performing some critical function. This is especially true for non-hostile and training movements. There is no guarantee that the safety seats would have saved Corporal Kerns or Corporal Reyes. However, studies have shown that safety seats significantly increase the chances of survival in a mishap.

4. The loss of these two brave Marines will be felt throughout the 2d Marine Aircraft Wing. I would like to express my heartfelt condolences to the Marines' families on behalf of all the Marines and Sailors of the Wing.


G. M. WALTERS



UNITED STATES MARINE CORPS
24TH MARINE EXPEDITIONARY UNIT
UNIT 73856
FPO AE 09502-3856

5800
Legal
25 June 12

FIRST ENDORSEMENT on (b)(3), (b)(6), (b)(7)c letter 5800 of 24 June 2012

From: Commanding Officer
To: Commanding General, II Marine Expeditionary Force

Subj: COMMAND INVESTIGATION INTO THE FACTS AND CIRCUMSTANCES
SURROUNDING THE CLASS "A" MISHAP INVOLVING THE MV-22B
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1. I have reviewed the subject investigation in its entirety; I concur with the facts, opinions and recommendations as stated. All information indicates the pilot-in-command accepted a relatively strong tailwind component, which by itself would have been relatively benign as proven by the previous departure. The tailwind component of the second departure was compounded by a series of imprecise decisions and actions in the cockpit creating a powerful downward pitching moment that rendered the flight controls ineffective. Unfortunately the altitude and rate at which this series of events occurred did not permit a recovery.

2. I specifically find that: 1) the injuries to (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c xxx xx (b)(6), (b)(7)c/7532 occurred "in the line of duty" and "not due to his own misconduct"; 2) the injuries to (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c xxx xx (b)(6), (b)(7)c/7532 occurred "in the line of duty" and "not due to his own misconduct"; 3) the death of Corporal Robby A. Reyes xxx xx (b)(6), (b)(7)c/6176 occurred "in the line of duty" and "not due to his own misconduct"; and 4) the death of Corporal Derek A. Kerns xxx xx (b)(6), (b)(7)c/6176 "occurred in the line of duty" and "not due to his own misconduct." I recommend that determinations be made as such.

3. This investigation exceeded the time prescribed for completion due to extensive coordination with the Aviation Mishap Board, connectivity issues while embarked on a naval vessel, non-availability of the injured pilots for a portion of the investigative period, and operational requirements. The extension of reporting requirements ensured a thorough and complete report.

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4. The loss of Corporal Reyes and Corporal Kerns significantly impacted the 24th MEU. Both were highly respected as superior Marines and contributing members to our mission and community. My thoughts and prayers remain with their families.

5. I am hopeful for a recovery of the injured pilots and I would look forward to the opportunity to serve with them in the future.

6. It is my sincere hope that important lessons can be learned from this mishap resulting in safety enhancements within the Marine Corps aviation community.

7. The point of contact concerning this matter is (b)(3), (b)(6), (b)(7)c
(b)(3), (b)(6), (b)(7)c at (b)(3), (b)(6), (b)(7)c

(b)(3), (b)(6), (b)(7)c



UNITED STATES MARINE CORPS

24TH MARINE EXPEDITIONARY UNIT
UNIT 73856
FPO AE 09502-3856

5800
S-2/dew
24 Jun 12

From: (b)(3), (b)(6), (b)(7)c XXX XX (b)(6), (b)(7) 0202 USMC
To: Commanding Officer, 24th Marine Expeditionary Unit

Subj: COMMAND INVESTIGATION INTO THE FACTS AND CIRCUMSTANCES
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Ref: (a) JAGINST 5800.7E
(b) OPNAV 3750.6R
(c) NATOPS Flight Manual Navy Model MV-22B Tiltrotor
(d) Joint Australian/New Zealand Standard AS/NZS
1170.2:2002 Structural design actions, Part 2: Wind
actions (AS/NZS 1170.2:2002)
(e) OPNAVINST 3710.7U

Encl: (1) Convening Order of 14 Apr 12
(2) Extension letter dated 14 May 12
(3) Copy of Marine Medium Tiltrotor Squadron 261(REIN)'s
flight schedule for 11 April 2012
(4) Operational Report-3/Serious Incident Report
(OPREP3/SIR)
(5) Investigating Officer's summary of interview with
(b)(3), (b)(6), (b)(7)c on 24 April 2012
(6) Investigating Officer's summary of interview with
(b)(3), (b)(6), (b)(7)c on 15 May 2012
(7) Investigating Officer's summary of interview with
(b)(3), (b)(6), (b)(7)c on 14 May 2012
(8) Screenshot from Joint Mission Planning System (JMPS)
noting actual GPS points observed from aircraft on 11
April 2012
(9) Selected still images from video taken of incident on
11 April 2012.
(10) CAP DRAA Exercise Journal
(11) Animation created by NAVAIR 4.3.2.6 based on Crash
Survivable Memory Unit (CSMU) and Vibration Life and
Engine Diagnostics System (VSLED) data from aircraft
(12) Eyewitness Video of Mishap
(13) 24th MEU Landing Force Operation Center (LFOC)
Journal Entry dtd 11 June 2012

Subj: COMMAND INVESTIGATION INTO THE FACTS AND CIRCUMSTANCES SURROUNDING THE CLASS "A" MISHAP INVOLVING THE MV-22B CRASH THAT OCCURRED NEAR CAP DRA'A, MOROCCO ON 11 APRIL 2012

- (14) Copy of designation as a Naval Aviator letter dated 21 November 2002 from (b)(3), (b)(6), (b)(7)c NATOPS Qualification Jacket
- (15) M-SHARP flight hours spreadsheet for FY-12 for (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c
- (16) Copy of NATOPS Evaluation (OPNAV 3710/7 Rev 4-90) dated 24 February 2012 from (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c NATOPS Qualification Jacket
- (17) Copy of NATOPS Instrument Rating Request (OPNAV 3710/2 Rev 1-74) dated 04 August 2011 from (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c NATOPS Qualification Jacket
- (18) Copy of current clearance notice (Aeromedical) from (b)(3), (b)(6), (b)(7)c health record
- (19) Copy of Flight Personnel Designation Record (Section IIA) from (b)(3), (b)(6), (b)(7)c NATOPS Qualification Jacket
- (20) Copy of Mission Qualification Record (Section IIB) from (b)(3), (b)(6), (b)(7)c NATOPS Qualification Jacket
- (21) Copy of Mishap/Flight Violation Record (Section IVB) from (b)(3), (b)(6), (b)(7)c NATOPS Qualification Jacket
- (22) Copy of designation as a Naval Aviator letter dated 23 June 2010 from (b)(3), (b)(6), (b)(7)c NATOPS qualification Jacket
- (23) M-SHARP flight hours spreadsheet for FY-12 for (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c
- (24) Copy of NATOPS Evaluation (OPNAV 3710/7 Rev 4-90) dated 29 November 2012 from (b)(3), (b)(6), (b)(7)c NATOPS Qualification Jacket
- (25) Copy of NATOPS Instrument Rating Request (OPNAV 3710/2 Rev 1-74) dated 28 November 2011 from (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c NATOPS Qualification Jacket
- (26) Copy of current clearance notice (Aeromedical) from (b)(3), (b)(6), (b)(7)c health record
- (27) Copy of Flight Personnel Designation Record (Section IIA) from (b)(3), (b)(6), (b)(7)c NATOPS Qualification Jacket
- (28) Copy of Mission Qualification Record (Section IIB) from (b)(3), (b)(6), (b)(7)c NATOPS Qualification Jacket
- (29) Copy of Mishap/Flight Violation Record (Section IVB) from (b)(3), (b)(6), (b)(7)c NATOPS Qualification Jacket

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- (30) Marine Corps Total Forces System (MCTFS) Basic Individual Record accessed (BIR) for Corporal Derek A. Kerns
- (31) Permanent Change of Assignment (PCA) Orders for Corporal Derek A. Kerns dated 24 March 2011
- (32) Kerns' Deployment Orders to attach to 24th MEU
- (33) Copy of NATOPS Evaluation (OPNAV 3710/7 Rev 4-90) dated 12 February 2012 from Corporal Derek A. Kerns' NATOPS Qualification Jacket
- (34) Copy of Flight Personnel Designation Record (Section IIA) from Corporal Derek A. Kerns' NATOPS Qualification Jacket
- (35) Copy of Mission Qualification Record (Section IIB) from Corporal Derek A. Kerns' NATOPS Qualification Jacket
- (36) Marine Corps Total Forces System (MCTFS) Basic Individual Record accessed (BIR) for Corporal Robby A. Reyes
- (37) Permanent Change of Assignment (PCA) Orders for Corporal Robby A. Reyes dated 25 May 2011
- (38) Reyes' Deployment Orders to attach to the 24th MEU
- (39) Copy of NATOPS Evaluation (OPNAV 3710/7 Rev 4-90) dated 12 February 2012 from Corporal Robby A. Reyes' NATOPS Qualification Jacket
- (40) Copy of Flight Personnel Designation Record (Section IIA) from Corporal Robby A. Reyes' NATOPS Qualification Jacket
- (41) Copy of Mission Qualification Record (Section IIB) from Corporal Robby A. Reyes' NATOPS Qualification Jacket
- (42) NALCOMIS OMA
- (43) Copy of Mishap Aircrew Risk Assessment Worksheet dated 11 April 2012
- (44) IWO Weather Update 11 April 2012
- (45) (b)(3), (b)(6), (b)(7)c METOC Analysis of MV22 Mishap
- (46) Investigating Officer's summary of interview with (b)(3), (b)(6), (b)(7)c on 23 April 2012
- (47) Landing Zone Diagram (LZ North)
- (48) (b)(3), (b)(6), (b)(7)c Statement
- (49) (b)(3), (b)(6), (b)(7)c Statement
- (50) Death Certificate of Corporal Reyes
- (51) Investigating Officer's summary of interview with (b)(3), (b)(6), (b)(7)c Summary on 16 April 2012
- (52) Death Certificate of Corporal Kerns
- (53) Autopsy Examination Report of Corporal Kerns
- (54) Autopsy Examination Report of Corporal Reyes

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- (55) (b)(3), (b)(6), (b)(7)c (VMM-261 Flight Surgeon) email dtd 24 June 2012
- (56) (b)(3), (b)(6), (b)(7)c email dtd 13 June 2012

Preliminary Statement

1. Pursuant to enclosures (1) and (2), I conducted a command investigation into the circumstances surrounding the MV-22B accident on 11 April 2012 that resulted in the deaths of Corporal Robby A. Reyes xxx xx(b)(6), (b)(7)c6176, and Corporal Derek A. Kerns xxx xx(b)(6), (b)(7)c6176, and significant injuries to (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c xxx xx(b)(6), (b)(7)c7532, and (b)(3), (b)(6), (b)(7)c xxx xx(b)(6), (b)(7)c7532.

2. This incident was simultaneously investigated by an Aviation Mishap Board (AMB), led by (b)(3), (b)(6), (b)(7)c Marine Aircraft Group 26, Marine Corps Air Station New River, North Carolina. Prior to initiating this investigation, and at all times during, I maintained constant contact with (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c to ensure proper coordination of our investigatory efforts.

3. All documentary evidence included herein is either an original or a copy of the original documents. The AMB possesses most of the original copies of documentary evidence, as well as pertinent physical evidence, related to this investigation. The primary point of contact for the AMB is (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c

4. All times in this report are based on the 24 hour clock and on Greenwich Mean Time (GMT).

5. No testimonial detailed evidence is available describing the morning routines of the aircrew on the day of the incident, however there is no indication that their actions or inactions contributed in any way to this incident.

6. All reasonably available evidence was collected and each directive of the Convening Authority has been met. During the course of this investigation I consulted with (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c 24th Marine Expeditionary Unit (MEU), and (b)(3), (b)(6), (b)(7)c 24th MEU.

Subj: COMMAND INVESTIGATION INTO THE FACTS AND CIRCUMSTANCES SURROUNDING THE CLASS "A" MISHAP INVOLVING THE MV-22B CRASH THAT OCCURRED NEAR CAP DRA'A, MOROCCO ON 11 APRIL 2012

FINDINGS OF FACT

AIRCRAFT AND PERSONNEL INVOLVED

7. A Marine MV-22B aircraft, Bureau Number (BuNo) 165844, side number 11, assigned to Marine Medium Tiltrotor Squadron (VMM) - 261 (Reinforced), 24th MEU, was involved in an aviation mishap in vicinity of Cap Draa, Morocco during Exercise AFRICAN LION 12. [Encl (3), (4)]

8. The mishap aircraft was scheduled to transfer a platoon of Marines from the Plage Blanche Airfield in Tan Tan, Morocco to a landing zone in the vicinity of Cap Draa, Morocco (LZ North). This transfer was to take place in three separate movements of 12 passengers each, for a total transfer of 36 Marines. [Encl (3), (5), (6), (7)]

9. The mishap aircraft was crewed by two pilots. Both pilots sustained significant injuries as a result of the mishap. The aircraft commander was (b)(3), (b)(6), (b)(7)c xxx xx (b)(6), (b)(7)c 7532 USMC. The co-pilot was (b)(3), (b)(6), (b)(7)c xxx xx (b)(6), (b)(7)c 7532 USMC. [Encl (3), (4), (6), (7)]

10. The mishap aircraft had two enlisted crew assigned during the flight, Corporal Robby A. Reyes xxx xx (b)(6), (b)(7)c 6176, and Corporal Derek A. Kerns xxx xx (b)(6), (b)(7)c 6176. Both crew members died as a result of the mishap. [Encl (3), (4), (6), (7)]

11. The mishap aircraft was last located at Landing Zone (LZ) North (MGRS 29R KM 92017 73669), in the vicinity of Cap Draa, Morocco. The mishap aircraft had just dropped off 12 Marines from Company B, Battalion Landing Team 1/2 after transferring them from the Plage Blanche Airfield. [Encl (4), (5), (6), (7), (8), (9), (10), (11)]

12. Approving authority for the flight was (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c VMM-261(REIN) Commanding Officer. [Encl (3)]

13. The mishap occurred at approximately 1553(Z) on 11 April 2012. [Encl (4), (5), (6), (7), (11), (12), (13)]

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PILOTS' BACKGROUND, DESIGNATIONS AND QUALIFICATIONS

14. (b)(3), (b)(6), (b)(7)c was designated a Naval Aviator on (b)(6), (b)(7)c and had logged (b)(6), (b)(7)c hours of total pilot time and (b)(6), (b)(7)c hours in the MV-22B prior to 11 April 2012. [Encl (14), (15)]

15. (b)(3), (b)(6), (b)(7)c had logged (b)(6), (b)(7)c flight hours in the last 30 days, (b)(6), (b)(7)c flight hours in the last 60 days, (b)(6), (b)(7)c flight hours in the last 90 days, and (b)(3), (b)(6), (b)(7)c last flight prior to the mishap was 9 April 2012. [Encl (15)]

16. (b)(3), (b)(6), (b)(7)c had flown (b)(6), (b)(7)c flight hours since the beginning of the latest fiscal year. He was ahead of schedule to meeting required annual flight hours per reference (e). [Ref (e)] [Encl (15)]

17. (b)(3), (b)(6), (b)(7)c held (b)(6), (b)(7)c (b)(6), (b)(7)c (b)(6), (b)(7)c in the MV-22B. [Encl (16), (17)]

18. (b)(3), (b)(6), (b)(7)c completed an annual flight physical (b)(6), (b)(7)c (b)(6), (b)(7)c [Encl (18)]

19. (b)(3), (b)(6), (b)(7)c held the following qualifications and designations as an MV-22B pilot:

- a.
- b.
- c.
- d. (b)(6), (b)(7)c
- e.
- f.
- g.

[Encl (19), (20)]

20. (b)(3), (b)(6), (b)(7)c (b)(6), (b)(7)c [Encl (21)]

21. (b)(3), (b)(6), (b)(7)c was designated a Naval Aviator on (b)(6), (b)(7)c (b)(6), (b)(7)c and had logged (b)(6), (b)(7)c hours of total pilot time and 160.1 hours in the MV-22B prior to 11 April 2012. [Encl (22), (23)]

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22. (b)(3),(b)(6), (b)(7)c had logged (b)(6), (b)(7) flight hours in the last 30 days (b)(6), (b)(7) flight hours in the last 60 days, (b)(6), (b)(7) flight hours in the last 90 days, and (b)(3), (b)(6), (b)(7)c last flight prior to the mishap was 10 April 2012. [Encl (23)]

23. (b)(3), (b)(6), (b)(7)c had flown (b)(6), (b)(7) flight hours since the beginning of the latest fiscal year. He was ahead of schedule to meeting required annual flight hours per reference (e). [Ref (e)] [Encl (23)]

23. (b)(3), (b)(6), (b)(7)c (b)(6), (b)(7)c in the MV-22B. [Encl (24), (25)]

24. (b)(3), (b)(6), (b)(7)c completed an annual flight physical (b)(6), (b)(7)c (b)(6), (b)(7)c [Encl (26)]

25. (b)(3), (b)(6), (b)(7)c held the following qualifications and designations as an MV-22B pilot:

- a. (b)(6), (b)(7)c
- b. (b)(6), (b)(7)c
- c. (b)(6), (b)(7)c
- d. (b)(6), (b)(7)c
- e. (b)(6), (b)(7)c
- f. (b)(6), (b)(7)c

[Encl (27), (28)]

26. (b)(3), (b)(6), (b)(7)c (b)(6), (b)(7)c [Encl (29)]

BACKGROUND AND QUALIFICATIONS OF MARINES INVOLVED

27. Corporal Derek A. Kerns XXX XX (b)(6), (b)(7) 6176 was born on 05 June 1990, and was 21 years old on 11 April 2012. [Encl (30)]

28. Corporal Kerns' home of record is listed as Salem, New Jersey. [Encl (30)]

29. Corporal Kerns enlisted in the Marine Corps 08 September 2008 and was on continuous active duty until the date of his death. [Encl (30)]

30. Corporal Kerns joined Marine Medium Tiltrotor Squadron 261 on 24 March 2011. [Encl (31)]

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31. Corporal Kerns was promoted to his current rank of Corporal on 1 December 2010. [Encl (30)]

32. Corporal Kerns was ordered to deploy with the 24th Marine Expeditionary Unit, Camp Lejeune, North Carolina. This was Corporal Kerns' unit at the time of his death. [Encl (32)]

33. Corporal Kerns held a current Naval Air Training and Operations Procedures Standardization (NATOPS) qualification in the MV-22B. [Encl (33)]

34. Corporal Kerns was designated an MV-22B Crew Chief on 11 February 2010. [Encl (34)]

35. Corporal Kerns held the following qualifications and designations as an MV-22B Crew Chief:

- a. Low Altitude Tactics (LAT)
- b. Night Systems Qualified High Light Level (NSQ HLL)
- c. Night Systems Qualified Low Light Level (NSQ LLL)
- d. Carrier Qualified (CQ)

[Encl (35)]

36. Corporal Robby A. Reyes XXX XX (b)(6), (b)(7) 6176 was born on 02 March 1987, and was 25 years old on 11 April 2012. [Encl (36)]

37. Corporal Reyes' home of record is listed as San Bernardino, California. [Encl (36)]

38. Corporal Reyes enlisted in the Marine Corps 03 December 2007 and was on continuous active duty until the date of his death. [Encl (36)]

39. Corporal Reyes joined Marine Medium Tiltrotor Squadron 261 on 25 May 2011. [Encl (37)]

40. Corporal Reyes was promoted to his current rank of Corporal on 01 October 2010. [Encl (36)]

41. Corporal Reyes was ordered to deploy with 24th Marine Expeditionary Unit, Camp Lejeune, North Carolina. This was Corporal Reyes' unit at the time of his death. [Encl (38)]

Subj: COMMAND INVESTIGATION INTO THE FACTS AND CIRCUMSTANCES SURROUNDING THE CLASS "A" MISHAP INVOLVING THE MV-22B CRASH THAT OCCURRED NEAR CAP DRA'A, MOROCCO ON 11 APRIL 2012

42. Corporal Reyes held a current Naval Air Training and Operations Procedures Standardization (NATOPS) qualification in the MV-22B. [Encl (39)]

43. Corporal Reyes was designated an MV-22B Crew Chief on 23 January 2009. [Encl (40)]

44. Corporal Reyes held the following qualifications and designations as an MV-22B Crew Chief:

- a. Low Altitude Tactics (LAT)
- b. Night Systems Qualified High Light Level (NSQ HLL)
- c. Night Systems Qualified Low Light Level (NSQ LLL)
- d. Carrier Qualified (CQ)

[Encl (41)]

BACKGROUND OF MISHAP AIRCRAFT

45. At the time of the mishap, MV-22B BuNo 165844, side number 11, had 717.1 aircraft hours and had last flown on 9 April 2012. [Encl (42)]

46. The last Phase Inspection for MV-22B BuNo 165844 was a Phase "C", which was completed on 23 July 2011, at 4024.4 hours since new. [Encl (42)]

47. At the time of the mishap, MV-22B BuNo 165844 had 122.9 hours remaining until the next Phase Inspection, Phase "D", was due. [Encl (42)]

48. MV-22B BuNo 165844 was Partially Mission Capable (PMC), with the following limitations noted:

- a. Left Hand Leaking Window
- b. Ice Protection System (IPS)
- c. Left Sponson Refuel Valve

[Encl (42)]

49. MV-22B BuNo 165844 had 20 open Maintenance Action Forms (MAFs) and no downing discrepancies prior to the mishap flight. [Encl (42)]

50. At the time of the mishap, MV-22B BuNo 165844 had a "7 day inspection (afloat)" due on 11 April 2012. [Encl (42)]

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51. MV-22B BuNo 165844 had engines serial numbers 130057 and 130029 installed. [Encl (42)]

52. MV-22B BuNo 165844 engine serial number 130057 had 1236.3 total hours and had 122.8 hours remaining until its next Phase engine inspection (Phase "C") was due. [Encl (42)]

53. MV-22B BuNo 165844 engine serial number 130029 had 722.5 total hours and had 123.0 hours remaining until its next Phase engine inspection (Phase "D") was due. [Encl (42)]

MISHAP PILOTS' IMMEDIATE HISTORY

54. On 11 April 2012, (b)(3), (b)(6), (b)(7)c and (b)(3), (b)(6), (b)(7)c were scheduled as the pilot and co-pilot of a single aircraft Passenger, Mail, Cargo (PMC) flight that was scheduled to transfer a platoon of Marines from the Plage Blanche Airfield in Tan Tan, Morocco to a landing zone in the vicinity of Cap Draa, Morocco. [Encl (3), (6), (7), (8)]

55. (b)(3), (b)(6), (b)(7)c awoke at 0600Z, and conducted his normal morning routine after a good night's sleep the night of 10 April 2012. [Encl (6)]

56. (b)(3), (b)(6), (b)(7)c was able to get a good night's sleep the night of 10 April and was up in time to go to breakfast prior to 0700Z on 11 April. [Encl (7)]

57. (b)(3), (b)(6), (b)(7)c met (b)(3), (b)(6), (b)(7)c in the wardroom for breakfast, then went to the Ready Room to go over fuel calculations at approximately 0715Z for a 0830Z mission brief in the Ready Room. [Encl (7)]

58. The mishap pilot and co-pilot both attested to being well rested prior to their flight. [Encl (6), (7)]

59. There was nothing that happened out of the ordinary prior to the aviation mishap. [Encl (6), (7)]

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MISHAP EVENT

60. The mission brief for the flight went at 0830Z in the Squadron Ready Room on board USS IWO JIMA. The brief included briefs on the ship's weather, ATC, the emergency procedure of the day, and then a brief to the crew chiefs. (b)(3), (b)(6), (b)(7)c stressed several emergency procedures to the crew during his portion of the brief. [Encl (6), (7), (43), (44)]

61. Following the flight brief, (b)(3), (b)(6), (b)(7)c checked the Joint Mission Planning System (JMPS) to make sure the right way points were set and then had the crew chiefs go down to get the aircraft ready. The pilots met one hour prior to the flight in the ready room and checked the weather again, picked up their flight gear, and headed to the flight deck. [Encl (6)]

62. (b)(3), (b)(6), (b)(7)c the mission commander, sat in the right seat and (b)(3), (b)(6), (b)(7)c the co-pilot, sat in the left seat of the mishap aircraft. Corporal Reyes was the forward crew chief behind the cockpit and Corporal Kerns was the aft crew chief located at the tail of the aircraft. [Encl (4), (6), (7), (43)]

63. The mishap aircraft was scheduled to take off at 1500Z to participate in Passenger, Mail, Cargo (PMC) transfer movements of 36 Marines from Plage Blanche Airfield, Morocco to LZ North, vicinity of Cap Draa, Morocco. The aircraft took off approximately five minutes early. [Encl (3), (5), (6), (7)]

64. The mishap aircraft was scheduled to fly the following route: USS IWO JIMA to Plage Blanche Airfield (identified in the flight schedule as "GMAT"), to LZ North (vicinity of Cap Draa), to Plage Blanche Airfield, to LZ North, to USS IWO JIMA. This schedule was modified by aircraft pilots prior to departure based on weight calculations and fuel requirements. The new schedule added in one more lift from Plage Blanche Airfield to LZ North prior to returning to USS IWO JIMA. Scheduled return time for the aircraft was 1730Z. [Encl (3), (6), (7), (8)]

65. Weather noted at time of takeoff by the aircraft commander was a scattered layer of clouds over the water and overcast layer inland, but too high to adversely impact the flight. [Encl (6), (44), (45)]

66. (b)(3), (b)(6), (b)(7)c was pilot in control for the first half of the flight. He was in control for lift off from USS IWO JIMA, the

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first landing at Plage Blanche Airfield, and the first landing
at LZ North. [Encl (6), (7)]

67. The mishap aircraft landed at Plage Blanche Airfield,
Morocco on the runway where the taxiway meets the runway. While
on the deck, (b)(3), (b)(6), (b)(7)c observed the windsock located at the
airfield and the pilots adjusted their course line to head into
the wind at 330 degrees. The mishap aircraft picked up the
first stick of 12 Marines and departed for LZ North. [Encl (5),
(6), (7), (46)]

71. LZ North is a 408 foot by 492 foot rectangular, flat piece
of land that has been graded and filled with small rocks. The
center of the LZ is approximately 662 feet from a line of cliffs
that rise from the Atlantic Ocean (sea level) to 154 feet near
the LZ. This line of cliffs runs the length of the western edge
of Morocco throughout the Cap Draa region. [Encl (47)]

72. Turbulent eddies can occur behind an escarpment if the
correct wind shear and thermal conditions are met. Typically,
sunny, windy, thermally unstable days with moderate to strong
wind shear promote the greatest amount of turbulence. [Encl
(46)]

73. LZ North was within the turbulent wind effects potential
range for wind moving over escarpments as stated by reference
(d). This reference notes that a structure (in this case the
mishap aircraft) will be in the influence of a peak (top of the
cliff) provided that its distance from the peak is less than 10
times the elevation of the peak above sea level. [Ref (46)]

74. The mishap aircraft landed at LZ North with the nose heading
in to the wind, at 330 degrees. The mishap aircraft dropped off
12 Marines. [Encl (5), (6), (7), (8), (46)]

75. While coming into LZ North for the first time, (b)(3), (b)(6), (b)(7)c
noticed significant numbers of personnel, tents, and vehicles
around the LZ. (b)(3), (b)(6), (b)(7)c noted Amphibious Assault Vehicles
at his one o'clock, and tents and personnel at his ten o'clock.
Because of this, (b)(3), (b)(6), (b)(7)c decided the best course of action
was to leave the LZ the same direction he came in. [Encl (6)]

76. (b)(3), (b)(6), (b)(7)c lifted the aircraft, did a 180 degree pedal
turn to the right, and departed LZ North with no incident.
Nothing unusual was noted with the aircraft and no concern was

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noted by either pilot once this maneuver was completed. [Encl (6), (7)]

77. During the return trip to Plage Blanche Airfield, (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c passed controls of the aircraft to (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c was in control of the aircraft from that point until the mishap. [Encl (6), (7)]

78. The mishap aircraft landed at Plage Blanche Airfield and picked up the second set of 12 Marines, and departed for LZ North, heading on the same 330 degree course as the first approach. [Encl (5), (6), (7), (8), (46)]

79. At approximately 1550Z, the mishap aircraft landed in LZ North and offloaded 12 Marines. [Encl (5), (6), (7), (12)]

80. The weather at the time of the mishap, as recorded by USS IWO JIMA (approximately 15 nautical miles offshore) was:

- a. Sky condition: SCT010 BKN020 OVC 100
- b. Winds: 300° at 15kts
- c. Visibility: 6 SM
- d. Altimeter: 29.90
- e. Sunset: 1908
- f. EENT: 2001
- g. Light Level: Daytime
- h. Illumination: N/A

[Encl (44)]

81. Prior to taking off, (b)(3), (b)(6), (b)(7)c notified (b)(3), (b)(6), (b)(7)c that he would be doing the same maneuver that (b)(3), (b)(6), (b)(7)c had completed when leaving LZ North after dropping off the first stick of Marines. (b)(3), (b)(6), (b)(7)c concurred with the decision. [Encl (6)]

82. At 1553Z, mishap aircraft lifted up from LZ North. At the time of takeoff, the mishap aircraft's nose was facing approximately 320 degrees magnetic. [Encl (9), (11), (12)]

83. Animated recreation of the incident produced after calculating the data from the Crash Survivable Memory Unit (CSMU) and Vibration Life and Engine Diagnostics System (VSLED) indicated that when the mishap aircraft launched, the data recorders were calculating a calibrated airspeed (KCAS) for the

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aircraft of 25 knots. Video of the incident shows the aircraft was not moving forward at the time of launch. Based on the characteristics of the sensor on the aircraft, this indicated the aircraft was seeing winds equivalent to 25 knots headwind. [Encl (11), (12)]

84. When the mishap aircraft was approximately 20 feet off the ground, (b)(3), (b)(6), (b)(7)c began turning the aircraft 180 degrees in a rightward direction ("nose right, tail left" maneuver). The actual final heading of the aircraft at impact was 132 degrees magnetic. [Encl (5), (6), (7), (9), (11), (12)]

85. NATOPS Flight Manual for the MV-22, section 4.9.1 and figure 4-25(a) describe the airspeed limitations in VTOL hover and low speed flight. Figure 4-25(a) specifically highlights avoidance angles relative to wind, including 30-60 degrees, 150-210 degrees, and 300-330 degrees. [Ref (NATOPS MV-22)]

86. According to video and animated recreation of the incident, the aircraft completes a hover turn through the avoidance area from 300-330 degrees and enters into the avoidance area of 150-210 degrees (relative to the wind) 10 seconds into flight. [Encl (11), (12)]

87. At the completion of the pedal turn, the aircraft was approximately 46 feet off the ground, with the nose pitched downward at an approximate 5 degree angle. (b)(3), (b)(6), (b)(7)c recalled noting that during the pedal turn, the nose was, "an easy 10 down." [Encl (6), (9), (11), (12)]

88. NATOPS Flight Manual for the MV-22, section 7.16.1, states that "when normal hover altitude is reached, adjust nacelle angle to achieve a level nose attitude." [Ref (NATOPS MV-22)]

89. Animated recreation of the incident indicated that the aircraft nose began to pitch below level approximately 75 degrees into the hover turn and continued to lower through the rest of the flight. [Encl (11)]

90. Both (b)(3), (b)(6), (b)(7)c and (b)(3), (b)(6), (b)(7)c state that (b)(3), (b)(6), (b)(7)c immediately began to transition at the conclusion of the pedal turn, without pausing to hover. [Encl (6), (7)]

91. According to the animated recreation of the incident, 10 seconds into flight, the aircraft nacelles begin transition

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forward. Nacelles continue forward transition throughout remainder of flight, eventually transitioning from 87 degrees to an angle of 71 degrees 3 seconds after transition began (5.3 degrees per second rate). [Encl (11)]

92. NATOPS Flight Manual for the MV-22, section 7.17.1, states that, "as the nacelles are tilted forward, the aircraft nose attitude will tend to pitch down. The pilot must counter with aft cyclic to maintain a level fuselage attitude." [Ref (NATOP MV-22)]

93. At the moment transition of the nacelles begins, the aircraft data recorder calculated KCAS at 5 knots and thrust was calculated at 86 percent. [Encl (11)]

94. (b)(3), (b)(6), (b)(7)c and (b)(3), (b)(6), (b)(7)c both believed that they did not have significant ground speed when they began to transition. [Encl (6), (7)]

95. (b)(3), (b)(6), (b)(7)c states that the moment he started to transition was the moment he lost control of the aircraft. According to (b)(3), (b)(6), (b)(7)c he felt an overwhelming force that pushed the nose of the aircraft down. [Encl (7)]

96. According to animation of the incident, the aircraft pilot maintains rearward stick pressure of roughly 20% on the cyclic control stick throughout the flight. [Encl (11)]

97. Conditions that aggravate loss of aft stick control margin are forward of center of gravity, forward nacelle angle and higher rearward taxi speeds. Aggressive use of forward nacelles to arrest rearward flight can also cause loss of aft stick control margin. [Ref (NATOPS)]

98. According to animation of the incident, approximately 11 seconds into the flight, aircraft pilot makes a significant leftward jerk on the cyclic control stick, followed by pulling the cyclic control stick all the way to the rear. [Encl (6), (11)]

99. When (b)(3), (b)(6), (b)(7)c realized that (b)(3), (b)(6), (b)(7)c had lost control of the aircraft, he attempted to grab the cyclic control stick, but (b)(3), (b)(6), (b)(7)c had already pulled the stick all the way to the rear. [Encl (6), (7)]

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100. The aircraft turns nose down and impacts the ground at approximately a 45-60 angle, approximately 15 seconds into the flight. [Encl (9), (11), (12)]

101. At no time did (b)(3), (b)(6), (b)(7)c or (b)(3), (b)(6), (b)(7)c attempt to move the nacelles aft. (b)(3), (b)(6), (b)(7)c was unaware this maneuver could be used in order to increase stick control margin. [Ref (NATOPS)] [Encl (7)]

102. The mishap occurred at approximately 1553Z. [Encl (4), (10), (11), (12), (13)]

POST-MISHAP EVENT

103. Immediately upon impact, several members of Battalion Landing Team 1/2 and Combat Logistics Battalion 24 rushed towards the aircraft and started searching the wreckage for survivors. [Encl (5), (12), (48), (49)]

104. Visible fuel was leaking from the right wing and the engines were still spinning at this time. [Encl (5)]

105. (b)(3), (b)(6), (b)(7)c Platoon Commander, 2d platoon, Bravo Company, Battalion Landing Team 1/2, and several other Marines pulled (b)(3), (b)(6), (b)(7)c from the wreckage while the pilot was still in his seat and still strapped in. With help from several other Marines, (b)(3), (b)(6), (b)(7)c moved (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c away from the aircraft, unstrapped him, and started initial first aid. [Encl (5)]

106. A Marine from Battalion Landing Team 1/2 attempted to pull Corporal Reyes from the aircraft, but was unable to do so (b)(6), (b)(7)c (b)(6), (b)(7)c The Marine took Corporal Reyes' pulse and checked his eyes for any signs of reaction and determined that Corporal Reyes' had died. [Encl (5), (48), (50)]

107. Marines around the crash site then pulled (b)(3), (b)(6), (b)(7)c from the aircraft. At this time, (b)(3), (b)(6), (b)(7)c was unstrapped from his seat, conscious, and coherent. Once outside the aircraft, two corpsman from Battalion Landing Team 1/2 began providing medical attention to (b)(3), (b)(6), (b)(7)c [Encl (5)]

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108. Upon hearing additional sounds inside the aircraft, (b)(3), (b)(6), (b)(7)c dispatched a Marine, (b)(3), (b)(6), (b)(7)c from Combat Logistics Battalion 24, who found Corporal Kerns

(b)(6), (b)(7)c
(b)(6), (b)(7)c (b)(6), (b)(7)c
(b)(6), (b)(7)c
(b)(6), (b)(7)c . [Encl (5), (48)]

109. Corporal Kerns was (b)(6), (b)(7)c
(b)(6), (b)(7)c

He was coherent and talking. [Encl (5), (48)]

110. Corporal Kerns was then pulled through a hole in the wreckage to the outside of the aircraft and placed on a stretcher and attended to by corpsmen from the Battalion Landing Team. [Encl (48)]

111. (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c and Corporal Kerns were loaded on to Moroccan Puma helicopters and transferred via air to a landing zone approximately 500 meters from the Forward Resuscitative Surgical System (FRSS), located approximately 3 Nautical Miles south of the incident area. [Encl (5), (47), (51)]

112. At approximately 1610Z, the three injured Marines were brought in to the FRSS, triaged, and FRSS staff began providing life saving medical support. The FRSS had three teams of providers, one for each patient. [Encl (51)]

113. When the medical team conducted their initial assessment on Corporal Kerns, he (b)(6), (b)(7)c (b)(6), (b)(7)c was unable to communicate. [Encl (51)]

114. After providing Corporal Kerns with blood and oxygen, he was still not responding to any medical treatment. (b)(6), (b)(7)c

(b)(6), (b)(7)c
(b)(6), (b)(7)c The time of death for Corporal Kerns was approximately 1730Z. [Encl (13), (51), (52)]

115. Corporal Kerns' cause of death was torso injuries. Corporal Kerns sustained multiple injuries to the torso

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including (b)(6), (b)(7)c

(b)(6), (b)(7)c

(53)]

116. (b)(3), (b)(6), (b)(7)c came in to the FRSS in Class III shock. He
was supplied with intravenous fluids and blood. (b)(3), (b)(6), (b)(7)c

(b)(6), (b)(7)c

(b)(6), (b)(7)c

(b)(6), (b)(7)c

[Encl (51)]

117. After working on (b)(3), (b)(6), (b)(7)c for a short period, he
started showing signs indicating (b)(6), (b)(7)c

(b)(6), (b)(7)c

(b)(6), (b)(7)c

on (b)(3), (b)(6), (b)(7)c

in the FRSS. [Encl

(51)]

118. (b)(3), (b)(6), (b)(7)c arrived at the FRSS with (b)(6), (b)(7)c

(b)(6), (b)(7)c

(b)(3), (b)(6), (b)(7)c

was given

(b)(6), (b)(7)c

(b)(6), (b)(7)c

while the FRSS team worked on the other two

patients. [Encl (51)]

119. At approximately 1938Z, Corporal Reyes body was removed
from the aircraft and transported to the FRSS, arriving at
2005Z, awaiting follow on movement. [Encl (13)]

120. Corporal Reyes' cause of death was multiple severe injuries
to the head and torso. [Encl (54)]

122. All four personnel were loaded onto an MV-22B aircraft 500
meters from the FRSS at 2136Z and transported to Plage Blanche
Airfield, Tan Tan. [Encl (13)]

123. At 2220Z, all four personnel were loaded on to a C-130 at
Plage Blanche Airfield, Tan Tan, and transported to Landstuhl
Regional Medical Center, Germany. [Encl (13)]

124. (b)(3), (b)(6), (b)(7)c injuries included (b)(6), (b)(7)c

(b)(6), (b)(7)c

(b)(6), (b)(7)c

[Encl (55)]

125. (b)(3), (b)(6), (b)(7)c iniuries included (b)(6), (b)(7)c

(b)(6), (b)(7)c

(b)(6), (b)(7)c

[Encl (55)]

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126. Post-mishap AFIP lab tests were not drawn due to the fact that service members involved in this mishap were moved from site of accident to FRSS to Landstuhl quickly, and lifesaving interventions were first priority. [Encl (55)]

127. Mishap aircraft (BuNo 165844) had a total cost at delivery of \$73,312,084. Replacement cost for a similarly equipped aircraft is \$64,151,975. [Encl (56)]

OPINIONS

1. [REDACTED] (b)(5)
[REDACTED] (b)(5) FF
1, 7, 29, 38, 106, 114, 115, 120, 127]

2. Corporal Reyes died immediately or within seconds of the aircraft impact as a result of multiple severe injuries to the head and torso. [FF 106, 120]

3. Everyone involved in providing immediate medical attention to Corporal Kerns took every reasonable measure to prevent his death. [FF 103, 108-114]

4. The pilots of the mishap flight were [REDACTED] (b)(6), (b)(7)c met all prerequisites for operations prior to the aviation mishap. Both pilots were (b)(6), (b)(7)c and had flown safely one and two days before the mishap, respectively. [FF 14-26, 54-59]

5. The aircrew of the mishap flight were qualified to be working in the aircraft on the day of the mishap. [FF 27-44]

6. All required maintenance action was complete on the mishap aircraft BuNo 165844 and was considered safe for flight. [FF 45-53, 60-65]

7. The flight was thoroughly briefed in accordance with NATOPS and local SOPs. [FF 54-65]

8. Trauma caused by the impact of the gunners' belt worn by Corporal Kerns on his abdominal region ultimately was the cause of death, but there is no guarantee that he would have survived

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the accident if he were wearing a different harness or strapped in to the aircraft in any other way. [FF 108-110, 113-115]

9. Wind, calculated at anywhere from 15-27 knots during the flight, was a significant factor in this mishap. [FF 83-101]

10. The turbulent wind effects produced by wind moving over the cliffs near LZ North cannot be ruled out as a causal factor in this mishap. While the effects would be minimized at this distance from the cliffs, there is still the possibility that these effects combined with the other causal factors to produce the mishap. [FF 71-74, 80, 83]

11. The mishap aircraft co-pilot did not have a clear understanding of the true wind speed when taking off from LZ North just prior to the accident. This lack of understanding of the true wind speed at LZ North was a contributing factor in the accident. [FF 92-101]

12. When mishap aircraft co-pilot conducted his 180 degree pedal turn, he created a situation where the aircraft was operating at effectively negative 15-27 KCAS at the time the co-pilot lost control of the aircraft. [FF 83-101]

13. Failure to follow NATOPS procedures for VTOL Mode Hover and Low Speed Flight were a significant factor in this mishap. By conducting a 180 degree hover turn, the mishap aircraft co-pilot placed the aircraft directly into a tailwind of 15-27 knots, which was directly inside the 150-210 degree "Avoid" zone, per figure 4-25(a) of the NATOPS Manual for the MV-22B. [FF 83-101]

14. Failure to correct for a nose down attitude during the hover turn exacerbated the situation and compounded the severity of the other factors that led to the mishap. [FF 83-101]

15. The mishap aircraft had the nacelles moved too far forward for an aircraft at hover with a tailwind of 15-27 knots. Based on figure 4-20 (VTOL/CONV Mode Conversion Protection) of the NATOPS Manual for the MV-22B, the aircraft entered a zone that was outside the conversion protection limits. [FF 83-101]

16. The mishap aircraft co-pilot failed to adjust stick control margin during the pedal turn, preventing him from having enough aft cyclic stick control margin to overcome the effects of a

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nose down attitude and transitioning to aircraft mode with a
significant tailwind. [FF 83-101]

LINE OF DUTY/MISCONDUCT DETERMINATION

1. It is the determination of this investigating officer that
this mishap occurred "in the line of duty." (b)(3),(b)(6), (b)(7)c
(b)(3),(b)(6), (b)(7)c, Corporal Kerns, and Corporal Reyes were in active
service, and at the time of the accident were assigned to VMM-
261(REIN) aboard USS IWO JIMA.

2. It is also the determination of this investigating officer
that the mishap "did not occur as a result of misconduct" on the
part of (b)(3),(b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c Corporal Kerns, or Corporal
Reyes. There is no clear or convincing evidence that these
Marines intentionally or willfully neglected their duties or
training.

RECOMMENDATIONS

1. In the conduct of this investigation, investigating officer
found very few references within NATOPS manuals regarding
takeoffs and transition to flight with tail winds. Many of the
diagrams in the NATOPS Manual for the MV-22B discuss wind and
aircraft speeds, but the diagrams do not allow for times in
which a tailwind creates a situation where the aircraft is
effectively traveling backward. Recommend NATOPS manuals
(specifically for the MV-22B) clearly articulate what is
acceptable and what is unacceptable.

2. That no administrative or disciplinary action be taken
against the Flight Commander (b)(3), (b)(6), (b)(7)c for his role in the
accident.

3. That no administrative or disciplinary action be taken
against the Co-pilot, (b)(3), (b)(6), (b)(7)c for his role in the
accident.

4. It appears to the investigating officer that the "gunner's
belt" strap worn by Corporal Kerns caused the injuries that
ultimately caused his death. While it is unknown if Corporal
Kerns would have lived if he was wearing a differently designed
belt, this possibility needs to be explored. Marine Corps

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aviation should look into "gunner's belt" designs that spread out the impact of violent cessation of movement. Similar to seat belts on vehicles going from a lap belt (similar in style to the current "gunner's belt") to a three point safety restraint system, a "gunner's belt" design that spreads the force impact across the body may have resulted in significantly less injuries to Corporal Kerns.

5. The investigating officer was unable to find a compelling reason for the crew chiefs to not be strapped in to their seats during takeoff in a non hostile environment. Recommend Marine Corps aviation investigate actions that require crew members to be standing and/or moving about the cabin. At all other times, crew members should be required to remain seated with a four point seat belt fastened. Particular focus should be placed on administrative movements in a non hostile environment.

6. During the course of this investigation, the investigating officer received several statements and conducted numerous interviews regarding actions taken by Marines and Sailors post mishap. Several members of the 24th Marine Expeditionary Unit were highlighted as repeatedly going above and beyond to render immediate assistance in a known hazardous environment. Rapid response by a multi-lateral force, highlighted by heroic individual Marines' actions and top-quality emergency care by U.S. Naval medical personnel undoubtedly saved lives. Recommend that the Marines and Sailors involved in the immediate response to this mishap be recognized for their selfless efforts.

(b)(3), (b)(6), (b)(7)c