



DEPARTMENT OF THE NAVY  
COMMANDER U.S. THIRD FLEET  
63690 TOMAHAWK DR STE 388  
SAN DIEGO, CALIFORNIA 92147-6004

IN REPLY REFER TO:  
5830  
Ser N00/ 280  
30 JUL 12

SECOND ENDORSEMENT on CAPT H. L. Quintanilla ltr of 26 May 12

From: Commander, U.S. THIRD Fleet  
To: File

Subj: COMMAND INVESTIGATION INTO THE COLLISION BETWEEN USS  
ESSEX (LHD 2) AND USNS YUKON (T-AO 202) THAT OCCURRED ON  
16 MAY 2012

1. Readdressed. This is the final endorsement on the subject investigation.

2. This investigation documents a collision that occurred between USS ESSEX (LHD 2) and USNS YUKON (T-AO 202) during an underway replenishment in the Southern California Operating Area. While making her approach to YUKON, ESSEX suffered a steering gear casualty resulting in the temporary loss of steering control. The situation was further complicated by a set of less than favorable environmental factors. Although ESSEX was able to transition quickly to standby steering units and minimize the angle of collision, they were unable to avoid collision of the ESSEX aft starboard elevator with YUKON. Due to training simulator limitations, this exact type of steering casualty is not practiced in simulation. Consequently, the ESSEX crew had to rely on their professional training and knowledge, an underway replenishment briefing of emergency procedures and clear, unambiguous direction from experienced superiors.

In this incident, the investigation shows that the Commanding Officer failed to give clear, forceful direction to his crew when it was most needed. It was this lack of clear, forceful direction - not the collision itself - that caused my loss of confidence in his ability to command. After thorough review of the investigation and my own years of naval service, I have determined the training and experience of the Commanding Officer and the ESSEX crew was sufficient to perform the mission. Unfortunately, this Commanding Officer on this particular day, and under this specific set of circumstances, was unable to meet the challenge facing his crew. Consequently, my responsibility for the safety of the crew and the ship demand his relief for loss of confidence in his ability to command.

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3. Subject to the modifications and additions recommended in the first endorsement, the findings of fact are approved.

4. Subject to the modifications recommended by the first endorsement, opinions (2)(a), (2)(b), (2)(d), and (2)(e) are approved. (b)(5) While the use of a Conning Coach - Mentor contributed to a loss of watch team cohesion, command and control effectiveness, and situational awareness during this incident, I do not concur that in all cases "The use of Conning Mentors - Coaches is detrimental to effectively controlling ships maneuvering orders, particularly in extremis situations." (b)(5)

The additional opinions recommended in the first endorsement, opinions (4), (5), (6), (7), (8), (9), (10) and (11), are approved. (b)(5)

5. Subject to the modifications recommended by the first endorsement, the recommendations are approved. (b)(5)

6. I note that all actions in recommendations (1) through (5) have been taken by Commander, Expeditionary Strike Group THREE. This matter is closed.

7. My point of contact for this issue is CDR (b)(6), JAGC who can be contacted at (b)(6) or (b)(6)

*G. R. Beaman*  
G. R. BEAMAN

Copy to:  
COMNAVSURFPAC



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5830  
Ser N00J/043  
8 Jun 12

FIRST ENDORSEMENT on H. L Quintanilla ltr of 4 June 12

From: Commander, Expeditionary Strike Group THREE  
To: Commander, Naval Surface Force Pacific  
Via: Commander, U.S. THIRD FLEET

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1. In accordance with reference (a), I convened a command investigation to inquire into the facts and circumstances surrounding the collision between USS ESSEX (LHD 2) (ESX) and USNS YUKON (T-AO 202) (YUK) which occurred on 16 May 2012. My convening order directed the Investigating Officer to investigate all facts and circumstances surrounding this incident, including the cause, and any fault, neglect, or responsibility thereof.

2. I have studied this investigation and the statements of the watch standers. So that future reviewers of this investigation have insight into my thought process with regard to how and why I believe this incident occurred, I offer the following executive summary of the facts I relied upon to come to my conclusions, my thoughts and the thought process that led me to the opinions and recommendations that follow in this letter:

- I believe this collision could have been avoided. In fact, a collision was avoided; a collision on the bow, which both the YUK Master and ESX Commanding Officer (CO) acknowledged. After a series of course changes, rudder orders and engine orders due to "extremis", YUK Master stated "the two ships had a good angle on the bow". Similarly, the ESX CO's initial concern was focused on the bow and he states "the stern initially did not look as perilous as the bow though our spacing had easily closed to the site picture I normally saw when we shoot shotlines, 200-220 feet". It is before, during and after this position that a chain of events takes place, the most significant being excessive left rudder, unchecked, which resulted in the ESX stern swinging out and driving the starboard quarter of ESX into the port quarter of YUK.
- The situation that led to the unchecked, excessive left rudder was due to poor Bridge Resource Management (BRM), to include "watchstanders" acting in a capacity that is not in accordance with the Ships Organization and Regulations Manual.

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and Standing Orders, lack of a clear voice on the bridge and lack of backup to the CO and Conning Officer (Conn) by the watch team. ESX had an inexperienced team on watch for the circumstances. This UNREP should have been considered at least a moderate risk evolution and manned accordingly: this was the first UNREP for the BHR crew on ESX; the UNREP was taking place the day before homecoming; and, quartering environmental conditions were prevalent where shiphandling becomes more challenging and requires compensation for less than optimum conditions.

- BRM broke down completely when a split rudder casualty occurred. The commands directed on the bridge wing were completely different than the actions being taken in the pilot house. Specifically, the CONN team thinks they are increasing speed to 18 knots and using 1 to 2 degree left rudder movements. In actuality, the ship is at 13 knots with a full/hard left rudder.
  - The Helm and Lee Helm were "stuck" in alongside procedures and techniques, such as the use of Propeller Order Telegraph and Engine Order Telegraph, despite the ship attempting to maneuver to avoid collision.
  - Standard commands were not used which caused confusion.
  - There is no evidence of any repeat backs of orders - repeat backs may have highlighted errors to the watch team
  - It does not appear that indicators were checked to verify whether or not orders were being executed - namely engine and rudder orders (rudder was left 30-35 degrees and seemingly went unnoticed).
  - It does not appear that the Helm Safety Officer was verifying or monitoring the execution of any of the orders given.
  - OOD seemed to revert into a JOOD-like role (e.g., talking on the radio, answering phones and relaying messages).
  - The CONN Mentor (the CONN Mentor's role and authority on the Bridge is not defined in the Navy SORM, the ESX CO's Standing Orders, the ESX Navigation Bill, the ESX Restricted Maneuvering Doctrine (RMD) or the

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ESX SORM) is directing ship's movements.

- There were too many "voices" issuing instructions from the Bridge Wing to the Pilot House.
- There was no forceful backup present on the Bridge, a position most appropriately filled by Executive Officer.
- There is no clear indication that the Commanding Officer ordered any speed or course change with respect to handling the ship.

3. I have thoroughly reviewed the Investigating Officer's findings of fact, opinions and recommendations and, concur except as noted in the following dissertation. This detailed Report of Investigation satisfies the requirements contained in reference (a) and the direction of the Convening Order.

4. Findings of Facts of the Investigating Officer are approved subject to the following:

a. Findings of fact 1 - 32, pertaining the USS BONHOMME RICHARD (LHD 5) and USS ESSEX (LHD 2) hull swap, Pacific transit and UNREP preparations, are approved subject to the following:

(1) Finding of fact 21:

Add, BMSN (b)(6), NAVPERS 1070/604, as enclosure (56), to the List of Enclosures and insert as an enclosure supporting this fact.

Insert, at the end of finding of fact 21, the statement, "The CONN Mentor's role and authority on the Bridge is not defined in the Navy SORM, the ESX CO's Standing Orders, the ESX Navigation Bill, the ESX Restricted Maneuvering Doctrine (RMD) or the ESX SORM (\*Refer to finding of fact 29). Additionally, add enclosures (8) and (21) and references (f) and (g) to finding of fact 21.

(2) Finding of fact 22:

Insert, at the end of finding of fact 22, the statement, "The CONN Mentor's role and authority on the Bridge is not defined in the Navy SORM, the ESX CO's Standing Orders, the ESX Navigation Bill, the ESX Restricted Maneuvering Doctrine (RMD) or the ESX SORM (\*Refer to finding of fact 29). Additionally, add enclosures (8) and (21) and references (f) and (g) to finding of fact 22.

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(3) Finding of fact 23:

Add, in the Executive Officer's "Previous Experience" block, just before "GARY," insert "CO," and just before "FLETCHER," insert "XO then CO,".

Insert, at the end of finding of fact 23, the statement, "The CONN Mentor's role and authority on the Bridge is not defined in the Navy SORM, the ESX CO's Standing Orders, the ESX Navigation Bill, the ESX Restricted Maneuvering Doctrine (RMD) or the ESX SORM (\*Refer to finding of fact 29). Additionally, add enclosures (8) and (21) and references (f) and (g) to finding of fact 23.

(4) Insert the following as finding of fact 23.a:  
 Requirements for Afloat Command per COMNAVSURFORINST 1412.2 of 12 May 2010:

Afloat Command Pre-requisites	
<b>Surface Warfare Officer</b>	<b>Aviators (Ship, PHIBRON or MCM command)</b>
Attain a formal SWO (111X) designation	Successfully complete an operational squadron tour
Serve at least 60 months at sea	Receive formal designation as CDO Underway or have been qualified as Fleet OOD underway
Complete SWOS Department Head curriculum	Complete JPME 1
Pass the command qualification exam no sooner than 6 months after reporting for duties as Department Head	Officers selected for MCMRON should possess strong operational background in MCM TTPs
Complete seamanship/navigation exam while serving at sea	Complete SWOS PCO course
Attain EOOW and TAO qualifications	Be selected for Command by an Aviation Command screening board
Pass an oral command qualification board	Attend Command Leadership School
Complete JPME 1	
Be selected for Command at Sea by an administrative board	
Complete SWOS PCO course	
Attend Command Leadership School	

Add: Email CAPT (b)(6), PERS 41, dtd 4 Jun 12, as Enclosure (57), to the List of Enclosures and, COMNAVSURFORINST 1412.2 of 12 May 2010, as Reference (p) to the list of references. Insert as an enclosure and reference supporting this fact.

(5) Insert the following as finding of fact 23.b: The

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following is the standard course of instruction for all Major  
Command classes convening at SWOS Newport. 24 hours of classroom  
instruction.

4.0 Hrs. of Ship handling classroom instruction.

- Basic shiphandling procedures

1.5 Hrs. Introduction to Bridge Resource Management (BRM).

- Define BRM
- BRM objectives
- Contributing factors of the human elements in mishaps and methods for prevention
- Importance of BRM in the vessel's safety and efficiency
- Preventive measures to guard against errors

1.0 Hrs Communications.

- Effective interpersonal communications
- An open communication style on the bridge that encourage challenge and response
- Closed loop communications
- Recognize and alleviate communications barriers

1.0 Hrs Commanding Officer, Officer of the Deck, and Pilot relationships

- Effective command relationships
- An environment conducive to mutual information exchange
- Effective teamwork with OOD and Pilot
- Embark, brief, and establish a unity of effort with a marine Pilot
- Effective and continuous communication exchange
- Implement and maintain standard operating procedures

4.0 Hrs Electronic Chart Display and Information System (ECDIS)

- VMS overview
- Display settings and features settings as per NAVDORM
- Major menu functions, system set up, and safety configurations as per NAVDORM Ch. 5
- Approval process of plan
- Practical. Approval or disapproval of Navigation plan for their home port

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**2.5 Hrs. Error chain**

- Recognize the indications of development of the error chain
- Implement and modify controls necessary to interrupt the error chain; error trapping
- Comprehend the importance of situational awareness and its importance at each level of the watch team
- Implement effective operational risk management (ORM) to voyage planning

**2.0 Hrs. Basic Navigation principles**

- Resources for navigation
- Basic principles of navigation
- Buoys and other aids to navigation

**6.0 Hrs. Rules of the Road**

- COLREGS
- Inland Rules

**2.0 Hrs. Voyage Planning**

- Definitions and purpose of voyage planning or passage planning
- Stages of a voyage plan; Appraisal, Planning Execution, and Monitoring
- Responsibilities for development and execution
- Voyage plan is a living document to be reviewed and changed as necessary
- Teamwork in effective coordination of the voyage plan
- Contingency planning and emergency procedures
- Computer aids (ECDIS)

**The following is also included in Major Command instruction**

**Ship handling sessions.**

- Four, four hour sessions.
- First session; Undock vessel and transit out home port
- Second session; UNREP
- Third session; Docking in homeport.
- Fourth session; Practice for Bahrain assessment

**Ship handling assessment.**

- Transit into Bahrain and docking with one assist tug

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**½ Hrs. Chartlet for home port instructions**

- Provide students with blank chart and instruction sheet

**Chartlet of home port homework**

- Student completes Situational Awareness chartlet of home port
- 1.0 Hrs. Rules of the Road test - Passing grade 90%**

Add: Email (b)(6) , SWOS, dtd 2 Jun 12, as Encl (58) to the List of Enclosures and insert as an enclosure supporting this fact.

b. Findings of facts 33 - 44, pertaining to the morning of the UNREP, are approved.

c. Findings of fact 45 - 102, pertaining to the steering casualty and collision are approved subject to the following:

(1) Finding of fact 45:

Modify by (b)(5) changing to "-53 seconds."  
In my viewing of the video, the bow of ESSEX begins to come starboard at -54 seconds. Insert "YUK Master notices ESSEX beginning to come starboard." as the sentence prior to "YUK Master takes the CONN." NOTE: This change does not affect the actions that follow in the timeline as all times and actions are approximations; however, it does mark the point in time when ESSEX began to come starboard. The enclosure list is not affected by this change.

(2) Finding of fact 46:

(b)(5)  
Environmentals are noted in finding of fact 33. As winds and seas may change at any time, it cannot be stated as fact that the winds and seas are firmly in any position.

(3) Finding of fact 57:

Insert, immediately following the statement "CONN orders left hard rudder." the statement "CONN Mentor and CONN Mentor U/I state they immediately told CONN to "belay that." CO heard CONN Mentor say "belay that," but was not sure what she was referring to."

Insert, immediately following the statement directly above, "CONN states he "immediately did" belay his order of hard left rudder over the microphone. Helm states he did not hear "belay that" and did not acknowledge the call. Helm Safety does not recall hearing the order of "hard left rudder" or "belay that." Helm

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Safety recalls hearing "left full rudder" and stated this order was answered, "as far as I know." Helm (U/I) recalls the order coming from a male voice with a female voice saying as well. Master Helmsman hears "Hard Left" from Bridge wing and believes it was a female voice. Neither the Helm U/I nor the Master Helmsman recall hearing "belay that." No one from the Helm (Safety, Helm, Helm U/I) acknowledged the call to "belay that."

(b) (5) "ESX and YUK  
bow separation appears to be approximately 80 feet with the  
sterns well clear of each other."

(4) Add: Finding of fact 57.a:

The "Radian Rule" is a rule of thumb to assist Bridge teams in accounting for stern movements as rudder orders are answered. Each ship has a pivot point on which it rotates. The Radian Rule states that for every 1 degree of rudder movement, the stern will swing approximately 10 feet (1/60 the length of the ship) in the opposite direction of the rudder. This analysis is based on a 600 foot ship. During alongside operations, breakaway procedures specifically, the Bridge team must be highly cognizant of stern movements. When two ships have closed to 60-80 feet, distance must be opened quickly due to increasing interactive forces. Once breakaway is initiated, speed must be increased cautiously to avoid creating a decrease in the water pressure between the two ships (which could lead to an increase in Venturi effect and increased risk of collision). When two ships are in such close proximity, a course change is necessary to avoid a possible collision. For every degree of heading change to the left the stern moves right and will close by as much as 10 feet.

Add: "Quick Math for OODs" Surface Warfare Magazine Winter 2004 Vol. 29 No. 1 pg. 12-19 as reference (q) to the list of references and insert as a reference supporting this finding of fact.

(5) Finding of fact 58:

Insert immediately following the statement "ESX gyro is spinning starboard." the statement, "CONN Mentor orders the CONN to come to 087 degrees true. There is no apparent acknowledgment from the CONN or Helm. This order marks the beginning of a series of small course change orders made by the CONN Mentor in accordance with standard emergency breakaway procedures. The CONN Mentor utilizes small course changes to avoid stern swing."

(6) Finding of fact 60:

(b) (5)

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(7) Finding of fact 61:

(b)(5)

(8) Finding of fact 62:

Insert prior to the statement "ESX going left full/hard rudder." the statements "CONN MENTOR orders left course change to 086 degrees true. There is no apparent acknowledgment from the CONN or Helm."

Modify the statement (b)(5) to read  
"ESX going to left full/hard rudder."

(9) Finding of fact 67:

Insert prior to the statement "ESX at left full/hard rudder." the statement "CONN Mentor orders left course change to 085 degrees true. There is no apparent acknowledgment from the CONN or Helm."

(10) Finding of fact 70:

Delete the statement (b)(5) Environmentals are noted in finding of fact 33. As winds and seas may change at any time, it cannot be stated as fact that the winds and seas are firmly in any position.

(11) Findings of fact 71 - 76:

(b)(5)

Environmentals are noted in finding of fact 33. As winds and seas may change at any time, it cannot be stated as fact that the winds and seas are

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firmly in any position.

(12) Finding of fact 77:

(b)(5)

Environmentals  
are noted in finding of fact 33. As winds and seas may change at  
any time, it cannot be stated as fact that the winds and seas are  
firmly in any position.

Modify the statement "Conn Mento. calls for 18 knots." to read  
"Conn Mentor calls for 18 knots. No apparent verbal  
acknowledgment from Lee Helm."

Insert following the above statement, "CO hears the call for 18  
knots and is in agreement so he does not counter."

(13) Finding of fact 78:

Modify the statement (b)(5) to  
read "EOT still reads "Standard" and does not correlate with POT  
order of 160 RPM. Ship's RMD requires conflicting orders between  
POT and EOT be resolved immediately by the EOOW and the OOD via  
the 21MC. However, the RMD contains a note that "when alongside  
another vessel for replenishment, the POT shall have precedence."

(b)(5)

Environmentals  
are noted in finding of fact 33. As winds and seas may change at  
any time, it cannot be stated as fact that the winds and seas are  
firmly in any position.

(14) Finding of fact 79: (b)(5)

Environmentals  
are noted in finding of fact 33. As winds and seas may change at  
any time, it cannot be stated as fact that the winds and seas are  
firmly in any position.

(15) Findings of fact 80 - 84:

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(b) (5)

Environmentals  
are noted in finding of fact 33. As winds and seas may change at  
any time, it cannot be stated as fact that the winds and seas are  
firmly in any position.

(16) Finding of fact 85:

(b) (5)

For ease of the  
reader, this finding of fact will be left intentionally blank.  
Following findings of fact will retain their numbering as noted  
in the investigation.

(17) Findings of fact 86 - 87:

(b) (5)

Environmentals  
are noted in finding of fact 33. As winds and seas may change at  
any time, it cannot be stated as fact that the winds and seas are  
firmly in any position.

(18) Finding of fact 88:

Add the statement "This action is not corroborated by the Helm  
U/I or any other watch stander." directly following the  
statement "ESX Master Helm grabs helm & turns rudder to amidships  
- ESX going from left full/hard rudder to rudder amidships."

(b) (5)

(b) (5)

Environmentals  
are noted in finding of fact 33. As winds and seas may change at  
any time, it cannot be stated as fact that the winds and seas are  
firmly in any position.

(19) Finding of fact 89:

(b) (5)

(b) (5)

Environmentals  
are noted in finding of fact 33. As winds and seas may change at  
any time, it cannot be stated as fact that the winds and seas are

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firmly in any position.

(20) Findings of fact 90 - 93:

(b)(5)

Environmentals  
are noted in finding of fact 33. As winds and seas may change at  
any time, it cannot be stated as fact that the winds and seas are  
firmly in any position.

(21) Findings of fact 94 - 108 are approved.

4. The Investigating Officer's opinions, except as modified  
below are approved:

(b)(5)

b. Opinion 2a is approved.

c. Opinion 2b is approved. However, while environmental  
factors were present on the day of the incident, there is no way  
to precisely determine the effect these factors had on ESX  
leading to the collision.

(b)  
(5)

e. Opinion 2d is approved.

f. Opinion 2e is approved. I would also add that the number  
of U/I's may have been excessive considering this was the first  
UNREP for the watch team on ESX. However, the Commanding Officer  
had the ability to take control of the situation and lead this  
team when the crisis arose.

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(b)

(b  
)  
(S  
)

j. The following opinions are added to this investigation:

Opinion 4: While a loss of steering casualty alongside another vessel is a precarious situation - in this case, recovery and avoidance of a collision was possible and probable. The Bridge watch team had nearly a minute to recover and, if the correct and timely maneuvering actions had been taken by the CONN, OOD and CO, this collision could have been avoided. [FF (48) - (94)]

Opinion 5: Based on the YUK ECR video and watch stander interviews, the imminent collision was between the bows of ESX and YUK. After a series of course changes, rudder orders and engine orders due to "extremis", YUK Master stated "the two ships had a good angle on the bow". Similarly, the ESX CO's initial concern was focused on the bow and he states "the stern initially did not look as perilous as the bow though our spacing had easily closed to the site picture I normally saw when we shoot shotlines, 200-220 feet". In my opinion, the ships had good

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angles and the collision was avoided at this point. With proper, timely and standard procedures initiated, the sterns would have also remained clear of each other. [FF (48) - (94)]

Opinion 6: The CONN Mentor's role and authority on the Bridge is not defined in the Navy SORM, the ESX CO's Standing Orders, the ESX Navigation Bill, the ESX Restricted Maneuvering Doctrine (RMD) or the ESX SORM. That said, it appears that the CONN Mentor understood the situation ESX faced following the loss and recovery of steering control and how to properly open YUK following recovery of steering. Based on her statement, she gave proper orders to steer left in small increments. Additionally, she ordered 18 knots which would have allowed ESX to further clear YUK as YUK slowed. However, due to a breakdown in BRM, it does not appear that any of the CONN Mentor's orders were answered. The re-creation of the facts indicates the CONN Mentor began giving course changes to the left approximately 35-40 seconds prior to the collision which, if answered and continued would have allowed ESX to clear YUK and avoid collision. ESX would have been better served if the CONN Mentor (the most experienced OOD on board ship) was assigned the responsibility as Conning Officer for this evolution. [FF (21)-(23), (29), (57) - (77)]

Opinion 7: The Bridge watch team was unaware that the CONN Mentor's orders were not being answered. Instead, the Helm was answering a hard or full left rudder. It is evident that key watch standers (CONN, CONN Mentor, OOD, XO, CO) were not monitoring indicators on the bridge, or, they were monitoring the indicators and could not understand why these indicators were not responding to the orders given. In either case, there was a problem. The Helm was answering 30-35 degrees left rudder and no one on the Bridge was aware they had hard/full rudder and that the stern was beginning swing and was picking up speed. [FF (57) - (94)]

Opinion 8: As the ship began to head towards danger, the Bridge become chaotic. Orders were coming from many directions and voices. Watch standers were confused what orders were being given and who they were coming from. Orders were not acknowledged. The result was a complete loss of situational awareness on the bridge - and no one was paying attention to the stern. At this time, it was incumbent upon ONE person, the Commanding Officer, to take unambiguous control of the Bridge and the Bridge watch team. He did not do this at any time leading up to the collision. There is no clear indication the Commanding Officer ordered any speed or course change with respect to handling the ship. [FF (48) - (94)]

Opinion 9: While it is Commanding Officer's prerogative to defer to his watch team's orders (when he believes they are the correct

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orders and that there is no need to counter them), he must still maintain full awareness of the situation. If the Commanding Officer chooses to defer to his watch team, he maintains responsibility for ensuring the orders of his watch team are properly executed and if not, he has a duty to step in and take control of the situation. The Commanding Officer is inescapably responsible for the ship and crew - at all times. [FF (55) - (77)]

Opinion 10: It is easy to second guess others actions; however, in this situation, it is my strongest opinion that this collision was completely avoidable. The two ships were in a tight position, but there was time to recover. But, due to the complete loss of situational awareness (on the part of the CO, XO, OOD and the CONN) and a major breakdown in BRM, this plan was not executed and; therefore, never had a chance to succeed. In my opinion, this collision was not due to the proximity of the ships at the time of the steering casualty; the prevailing winds and seas; or Venturi effect - the cause of this collision was, unequivocally, a 30-35 degree left rudder that went unchecked for approximately 30 seconds. [FF (48) - (94)]

Opinion 11: The Commanding Officer is accountable for this incident. His watch team made mistakes, but he was responsible, as the Commanding Officer, to notice and correct these mistakes. In order to do so, he had to take control of the situation and he did not. [FF (48) - (94)]

(b)(5)

5. The Investigating Officer's recommendations, approved as modified below:

a. Recommendation 1 is approved as modified. Modify recommendation 1 to read, "I recommend appropriate administrative action be taken in the case of the Helm Safety Officer for dereliction in the performance of his duties in that he failed to ensure the Helmsman was properly receiving, acknowledging and executing the orders of the CONN as it was his duty to do.

b. Recommendation 2 is approved as modified. Modify recommendation 2 to read, "I recommend appropriate administrative action be taken in the case of the Conning Officer for dereliction in the performance of his duties in that he failed to ensure the Helmsman properly received, acknowledged and executed his orders at a critical time.

c. Recommendation 3 is approved as modified. Modify recommendation 3 to read, "I recommend appropriate administrative

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action be taken in the case of the OOD for dereliction in the performance of his duties in that he lost control of the Bridge watch team and failed to maintain situational awareness at a critical time.

d. Recommendation 4 is approved as modified. Modify recommendation 4 to read, "I recommend appropriate administrative action be taken in the case of the Executive Officer for dereliction in the performance of his duties in that he failed to provide any discernable back up to the Commanding Officer or the watch team. Additionally, the Executive Officer stated that the CONN Mentor is an approved watchstation.

e. Recommendation 5 is approved as modified. Modify the words (b)(5) to read, "I recommend the Commanding Officer be relieved of command due to loss of confidence and that appropriate disciplinary action be taken."

  
G. P. HUEBER

26 May 2012

From: Humberto L. Quintanilla II, CAPT, USN, XXX-XX-3467/1110  
To: Commander, Expeditionary Strike Group THREE

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Ref: (a) JAGMAN  
(b) 2B Steering Unit CASREP DTG 221230Z APR 12  
(c) 2B Steering RAM Unit CASREP DTG 221234Z APR 12  
(d) 1B Steering Gear Pump CASREP DTG 280040Z APR 12  
(e) 2A Steering Gear Pump CASREP DTG 280358Z APR 12  
(f) OPNAVINST 3120.32C, Standard Organization and  
Regulations Manual  
(g) LHD6INST 3120.1, USS ESSEX Standard Organization and  
Regulations Manual  
(h) LHD6INST 5350.4F, USS ESSEX Navigation Bill  
(i) Naval Shiphandling (4<sup>th</sup> Edition), R.S. Crenshaw, Jr.  
(j) Watch Officers Guide (15th Edition). ADM James  
Stavridis, USN and CAPT Robert Girrier, USN. Pages:  
121-123.  
(k) Naval Shiphandler's Guide. CAPT James A. Barber Jr,  
USN (Ret). Pages: 48, 175, 176, 185, and 186. NOTE:  
This text is used at SWOS for navigation training.  
(l) Shiphandling for the Mariner (3rd Edition). Daniel  
H. MacElvrey. Pages: 215-216.  
(m) Surface Ship Steering Systems. NSTM 562. S9086-TA  
STM-010/CH 562R2 (1 SEP 99). Revision 2. Page 562  
9.6.2 (Steering Casualty - Regaining Control).  
(n) Shipboard Bridge Resource Management. Michael R.  
Adams. Pages: 83-95 (Communications), 139-148  
(Teamwork), 151-167 (Error Chains). NOTE: This text  
is used at SWOS for navigation training.  
(o) Command at Sea (5th Edition). CAPT James Stavridis,  
USN and Vice Adm. William P. Mack, USN (Ret).  
Pages; 1-22 Chapter 1 "Taking Command", ("The  
Accountability of Command" - pages 5-6), ("The  
Philosophy of Command" - page 20 taking charge if  
necessary and page 21 boldness); Pages 178-200  
Chapter 7 "Safety" ("Who has the Conn?" - pages 192  
193); Appendix 5 (The BELKNAP-KENNEDY Collision)

Encl: (1) Appointment Ltr dtd 16 May 2012  
(2) Assumption of Command Ltr, dtd 23 Apr 12  
(3) Investigator's Interview Notes  
(4) USS ESSEX (LHD 2) Engineering Logs dtd 29 Apr - 17  
May 2012  
(5) USS ESSEX (LHD 2) Steering Check Log 15 May 12

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- (6) Underway Replenishment Check-Off Sheet 16 May 12
- (7) Underway Replenishment Brief 16 May 12
- (8) LHD6INST 3120.2F, CO's Standing Orders
- (9) Underway Replenishment Watch Bill
- (10) ENS (b)(6) OOD Designation Ltr dtd 9 Nov 11
- (11) LTJG (b)(6) OOD Designation Ltr dtd 1 Apr 10
- (12) LTJG (b)(6) OOD Designation Ltr dtd  
21 Sep 11
- (13) QM3 (b)(6) Master Helmsman Designation Ltr  
dtd 7 Nov 11
- (14) SN (b)(6) NAVPERS 1070/604
- (15) ENS (b)(6) NAVPERS 1070/613
- (16) LTJG (b)(6) NAVPERS 1070/613
- (17) BMSN (b)(6) NAVPERS 1070/604
- (18) ENS (b)(6) NAVPERS 1070/613
- (19) SN (b)(6) NAVPERS 1070/604
- (20) Statement of CAPT Charles Litchfield
- (21) LHD6INST 3540.23, Restricted Maneuvering Doctrine
- (22) USS ESSEX (LHD 2) Deck Log 15 - 16 May 2012
- (23) Underway Replenishment METOC Brief 15 May 12
- (24) Statement of CAPT (b)(6)
- (25) Statement of ENS (b)(6)
- (26) USS ESSEX (LHD 2) CIC Watch Log 16 May 2012
- (27) Statement of LTJG (b)(6)
- (28) Statement of ENS (b)(6)
- (29) Statement of LTJG (b)(6)
- (30) Statement of SN (b)(6)
- (31) Statement of Captain (b)(6)
- (32) USS YUKON (T-AO 202) ECR Video (CD-ROM)
- (33) USS ESSEX (LHD 2) Bell Log 16 May 12
- (34) Statement of QM3 (b)(6)
- (35) Statement of ENS (b)(6)
- (36) Statement of (b)(6)
- (37) Statement of BMSN (b)(6)
- (38) Statement of ENS (b)(6)
- (39) Statement of ENS (b)(6)
- (40) Statement of ENS (b)(6)
- (41) Statement of SN (b)(6)
- (42) Statement of EMFN (b)(6)
- (43) Statement of IC3 (b)(6)
- (44) Statement of LTJG (b)(6)
- (45) Statement of BMSN (b)(6)
- (46) Statement of EMFN (b)(6)
- (47) THIS ENCLOSURE NOT USED
- (48) Statement of MM3 (b)(6)
- (49) Statement of MMC (b)(6)

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- (50) USS ESSEX (LHD 2) Bridge to Bridge Radio  
Communications Log 16 May 2012
- (51) Photographs of Damage to USS ESSEX (CD-ROM)
- (52) Statement of MM3 (b)(6)
- (53) Video Re-creation of Steering Casualty 16 May 12  
(CD-ROM)
- (54) SWRMC Tech Assist Report
- (55) ISE Advisory

PRELIMINARY STATEMENT

1. This Command Investigation (CI) was convened by order of Commander, Expeditionary Strike Group THREE and was conducted in accordance with reference (a) and enclosure (1) from 16 May 2012 through 04 June 2012. The purpose of the CI was to examine the facts and circumstances related to the collision that occurred between USS ESSEX (LHD 2) and USNS YUKON (T-AO 202) that occurred on 16 May 2012. LCDR (b)(6), JAGC, USN, assisted with this investigation.
2. Prior to beginning this CI, OJAG (Code 11) was contacted.  
(b)(5), (b)(6)
3. All reasonably available evidence pertinent to the conduct of this CI has been collected. The Commanding Officer, USS ESSEX had watch standers write down their recollections shortly after the collision. Watch standers were given Article 31b rights before turning in their personal statements. All watch standers provided their previously written voluntary statements to the Investigating Officer. All personnel interviewed provided sworn statements. Additionally, all personnel interviewed were given the opportunity to review investigator's notes taken during their interviews and to make any changes or edits they deemed necessary. Witnesses initialed each page of the notes taken from their respective interviews and signed and signed and dated at the end of said notes.
4. All of the individuals and witnesses involved in this CI were cooperative, accessible, and forthcoming with all information.
5. The final damage survey and repair assessment for USS ESSEX is not currently available and is not included in this report. However, photos of damaged areas are included.

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6. All times are stated in local time unless otherwise indicated. All ship's logs are in local time.
7. All ship instructions utilized during this investigation are USS BONHOMME RICHARD (LHD 6) instructions. Due to the recent hull swap, not all instructions have been updated to reflect USS ESSEX (LHD 2).
8. Enclosure (3) is the Investigator's Notes. This notebook contains all notes taken during interviews. Pages are numbered and the notebook contains a table of contents. When enclosure (3) is cited, it will contain the name of the interviewee being specifically cited.
9. All documentary evidence included herein is certified to be either the original or a copy that is a true and accurate representation of the original document.

FINDINGS OF FACT

- I. **USS BONHOMME RICHARD (LHD 5) (BHR) AND USS ESSEX (LHD 2) (ESX) HULL SWAP, PACIFIC TRANSIT AND UNREP PREPARATIONS**
  1. On 23 April 2012, the former crew of BHR officially took ownership of ESX after an exchange of command ceremony in which CAPT Litchfield assumed command of ESX. [Encl (2), (3) (b)(6)]
  2. Prior to the exchange of command between BHR and ESX, the following Steering Unit CASREPs were active on ESX:
    - a. 2B Steering Unit (#12071) - able to continue mission
    - b. 2B Steering Ram (#12075) - able to continue mission[Encl (2); Ref (b), (c)]
  3. Upon receipt of ESX, the former BHR crew submitted CASREPs on the following Steering Unit related equipment on ESX:
    - a. 1B Steering Gear Pump (#12088) - able to continue mission
    - b. 2A Steering Gear Pump (#12089) - able to continue mission

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[Encl (2); Ref (d), (e)]

4. ESX departed Sasebo, Japan for San Diego, CA and permanent change of homeport on 28 April 2012. [Encl (3) (b)(6)]
5. ESX satisfactorily completed her Safe to Operate and Verification (STOV) on or about 28 April 2012. This verification included rudder swing checks. [Encl (3) (b)(6)]
6. QM3 (b)(6) noticed during STOV that the Rudder Angle Indicator (RAI) was off approximately left 5 degrees. This meant that with rudders at amidships, the gyro would spin, 5 degrees left on the RAI was necessary to steady the gyro. QM3 (b)(6) reported this discrepancy to the the Helm Safety Officer and the Conning Officer. According to QM3 (b)(6) SN (b)(6) was also aware of this discrepancy in the RAI. Both QM3 (b)(6) and SN (b)(6) were aware they must compensate for this discrepancy and both knew how. [Encl (3) (b)(6)]
7. The discrepancy with the RAI continued all throughout the transit to San Diego and did not degrade. The discrepancy was present on the day of the collision. [Encl (3) (b)(6)]
8. QM3 (b)(6) also stated that while standing the Helm watch on BHR and BOXER, similar conditions existed with the RAIs on these ships, but that a Helmsman learns how to compensate for hull specific idiosyncrasies. [Encl (3) (b)(6)]
9. Between 29 April 2012 and 16 May 2012, a total of 18 days, Steering Gear Units (SGU) were shifted 10 times. The 1A SGU was cycled a total of five times during this period. [Encl (4)]
10. All ten SGU shifts between 29 April - 16 May 2012 were accomplished with no indication of a problem in any of the four SGUs. [Encl (4)]
11. At 1837 on 15 May 2012, rudder swing checks were commenced. Rudder swing checks completed, satisfactory, at 1859 on 15 May 2012. These checks were completed by MM3 (b)(6) and witnessed by CW02 (b)(6) [Encl (3) (b)(6) (4), (5), (6)]

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12. MM3 (b)(6) completed at least two rudder swing checks on ESX prior to 15 May 2012. [Encl (3) (b)(6)]
13. On the evening of 15 May 2012, the underway replenishment (UNREP) brief for the 16 May 2012 underway replenishment (UNREP) with USNS YUKON (T-AO 202) (YUK) was given in the wardroom onboard ESX. [Encl (3) (Litchfield) (b)(6)  
, (7)]
14. All Bridge watch standers interviewed indicated they attended the UNREP brief with the exception of the Lee Helm who did not attend the Bridge UNREP brief. [Encl (3) (Litchfield) (b)(6)]
15. There was no muster sheet associated with the UNREP brief. [Encl (3) (b)(6) ]
16. Loss of steering and jammed rudder casualties were briefed along with emergency breakaway procedures. [Encl (7)]
17. The UNREP brief noted that a loss of steering casualty should be handled in accordance with EOCC and Standing Orders. [Encl (7)]
18. In the event of a loss of steering casualty onboard ESX, the following actions should be taken:
  - a. Helmsman reports, "Loss of steering, port/starboard unit, shifting to standby steering unit."
  - b. CONN orders Helmsman to test for positive control (with CO permission only)
  - c. If control is not regained, Helmsman reports, "Loss of steering, port/starboard unit, sounding Steering Casualty Alarm."
  - d. Aft Steering takes control, engages trick wheel. [Encl (7), (8)]
19. In the event of a jammed rudder condition, starboard, onboard ESX, the order should be given for all engines back full; YUK should be informed; and emergency breakaway initiated. [Encl (7), (8)]

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20. The UNREP Mission Summary was briefed as follows:

a. R Corpen: 090; R Speed: 13 kts.

b. Timeline:

0630: Station Boat Detail  
 0700: Small Boat Transfer  
 0730: Station UNREP Detail  
 0800: Rendezvous  
 0830: Alongside (total of 165 min)

[Encl (7)]

21. All UNREP Detail Bridge and After Steering watch standers were qualified for the watches assigned or under instruction with qualified watch standers. [Encl (7), (9), (10)-(19)]

22. The UNREP Bridge watch team was comprised of the Officer of the Deck (OOD), Junior Officer of the Deck (JOOD), Conning Officer (CONN), Conning Officer Mentor (CONN Mentor), Conning Officer Mentor U/I, Helm Safety Officer, Master Helmsman, Master Helmsman U/I, Lee Helm, Boatswain's Mate of the Watch (BMOW), Phone Talker, Messenger, FWD Lookout, Aft Lookout, and Bridge Deck Comms. [Encl (7), (9)]

23. Experience levels of key Bridge watch standers:

Position	Rank	Time in the Navy	OOD/Watch Qualification Date	Number of UNREPS Prior	Previous Experience
CO	CAPT	20+ years	OOD (2000)	4 (BHR), 10 (XO, BHR)	HAWES, Major Command PCO Pipeline, BHR
XO	CAPT	20+ years		4 (BHR)	GARY, FLETCHER
OOD	ENS	< 2 years	OOD (11/9/2011)	2 (OOD), 4-5 (CONN)	BHR

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CONN	ENS	< 2 years	N/A	1st approach (twice alongside as U/I), roughly 50 watches as CONN	BHR
CONN Mentor	LTJG	~ 3 years	OOD (4/1/2010)	52	BHR
Helm Safety Officer	ENS	< 2 years	Helm Safety (8/11/2011)	2	BHR
Master Helm U/I	SN	~ 2 years	Helmsman (9/21/11)	3 (U/I)	BHR
Master Helm	QM3	1yr 9 mos	Master Helm (11/7/2011)	15 (Master Helm), 25 (U/I)	BOX, BHR
Lee Helm	BMSN	~2 years	Lee Helm (3/2012)	1 <sup>st</sup>	6 months BHR, few months on SHOUP. None as Lee Helm.

[Encl (3)

(b) (6)

(10), (11), (13) - (15), (20)]

24. During UNREP, the OOD assists the Conning Officer in relaying orders to the helm regarding course and speed. [Ref (f)]
25. During UNREP, the CONN provides orders to the Helm and Lee Helm regarding course and speed. [Ref (f), (g)]
26. During UNREP, the Helmsman will steer courses ordered by the Conning Officer. [Ref (g)]
27. During UNREP, the Lee Helmsman will stand watch at the Engine Order Telegraph (EOT) on the bridge and will ring up the Conning Officer's orders to the engines ensuring that all bells are correctly answered. [Ref (g)]
28. During UNREP, the Helm Safety Officer observes the Helm and Lee Helm in the performance of their duties. The Helm Safety Officer will ensure that steering control station personnel acknowledge and comply with all orders of the Conning Officer. He/She shall assist as necessary in the

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event of a steering casualty and will have no other duties while assigned. [Ref (f), (g)]

29. The CONN Mentor's role and authority on the Bridge is not defined in the Navy SORM, the ESX CO's Standing Orders, the ESX Navigation Bill, the ESX Restricted Maneuvering Doctrine (RMD) or the ESX SORM. The OOD and the Master Helmsman on watch during the collision stated that the CONN Mentor has no authority to give orders and watch standers have no responsibility to follow audible recommendations from the CONN Mentor. The CONN Mentor at the time of the collision was the senior qualified OOD on the UNREP watch bill. [Encl (8), (11), (21); Ref (f), (g)]
30. The Commanding Officer (CO) may assume the Deck or the CONN at any time. [Encl (8)]
31. In order to assume the Deck or the CONN, the CO will normally make an announcement, "This is the Captain. I have the CONN." However, if the CO gives a direct order to the Helm or Lee Helm without such an announcement, or if the Helm or Lee Helm respond as the CO had issued them a direct order, the CONN will immediately announce, "The Captain has the CONN." Once the CO has the CONN, he will continue to exercise the CONN until it has been properly and positively turned over to another CONN or the OOD. [Encl (8)]
32. The UNREP (RAS) Check-Off Sheet commenced with rudder swing checks on the evening of 15 May 2012. Swing checks were completed at 1859, 15 May 2012. The RAS check-off recommenced at 0653 on 16 May 2012 and continued until approximately 0915, the point just prior to the shot line announcement. [Encl (4), (6), (22)]

## II. MORNING OF THE UNREP

33. Environmentals the morning of the UNREP were as follows:
  - a. True Wind: from 310 shifting to 300 degrees true at 21 dropping to 16 kts.
  - b. Sea State: 3-4 (estimated 6 foot seas).
  - c. Beaufort Scale: 5; skies overcast.

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Per reference (f), these conditions are acceptable  
conditions for UNREP.

[Encl (3) (Litchfield) (b)(6) ], (23); Ref (i)]

34. Small boat operations were conducted between ESX and YUK from approximately 0700 - 0830 without incident. [Encl (3) (Litchfield) (b)(6) ; (7)]
35. At 0730, the Underway Replenishment Detail was stationed. [Encl (4), (22)]
36. BMSN (b)(6) stood watch from 0400-0700, 16 May 12, the morning of the UNREP. [Encl (3) (b)(6)]
37. BMSN (b)(6) reported to Deck Division when the UNREP Detail was called away. She believed she would be standing watch as Rigger, but was told at this time she would be standing Lee Helm for the UNREP. BMSN (b)(6) was on the watch bill as Lee Helm. [Encl (3) (b)(6) ; (9)]
38. This was BMSN Hoover's first UNREP as Lee Helm. [Encl (3) (b)(6) ]
39. BMSN (b)(6) attended the Deck Department UNREP brief the night before, but did not attend the Bridge UNREP brief. [Encl (3) (b)(6) ]
40. At 0845, ESX commenced approach alongside YUK with Romeo Corpen at 090 degrees true and speed 13 knots. [Encl (20), (22), (24), (25)]
41. At 0847 Restricted Maneuvering was set. [Encl (4), (22), (25), (26)]
42. At approximately 0900, ESX was alongside YUK with a lateral separation of approximately 375 feet. [Encl (3) (b)(6) (27)]
43. Between approximately 0900 and 0915, ESX began closing YUK in preparation for shooting shot lines. [Encl (24), (27), (28)]
44. At 0916, ESX and YUK had approximately 250 feet of lateral separation. [Encl (28), (29)]

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### III. STEERING CASUALTY AND COLLISION

NOTE: At approximately 0916, the collision sequence begins. The timeline and associated events for the collision sequence were constructed as accurately as possible based on watch stander statements, logs, and video taken from a YUK ECR video camera system positioned on the port side of the YUK deck house and second video camera monitoring the YUK flight deck. The timeline begins at (b)(5) from impact.

45. (b)(5) : ESX is approximately 250 feet from YUK, based on laser range finder report, and preparing to fire shot lines while attempting to move forward 45 feet into UNREP position. Helm using 15 degree rudder left and right to maintain 088.5 degrees true ordered course with speed at 100 RPM on both shafts. YUK is the guide ship steering Romeo Corpen 090 degrees true at 13 knots awaiting ESX to move forward. Master of YUK has the CONN. YUK estimates ESX to be 150-200 feet away. ESX steering unit combination is 1A and 2B with 2A and 1B steering units in standby. Gyro error comparison between ESX and YUK is estimated to be left 2 degrees true. [Encl (4), (22), (25), (28)-(31), (33)]
46. -47 seconds: Helmsman using 15 degree right rudder to maintain 088.5 degrees true course ordered. Speed 100 RPM on both shafts. (b)(5)  
[Encl (24), (27), (30), (32), (33), (34), (35), (36)]
47. -46 seconds: Helmsman brings rudder back left to maintain ordered course of 088.5 degrees true. ESX was parallel to YUK and apparently stable, but had a lateral closure that indicated they had overcompensated on course to steer. According to the YUK Master, the ships were tight, but the situation was recoverable. YUK Master ordered course to 092 degrees true to give ESX time to adjust without creating a more dynamic relationship between the two ships. [Encl (30)-(32), (34), (35)]
48. -45 seconds: First indication of a split rudder on ESX. Port rudder is responding to Helm, starboard rudder remains right 15 degrees with speed at 100 RPM on both shafts. YUK Master observes ESX turning starboard and estimates lateral separation to be approximately 130 feet. YUK Master orders course of 095 degrees true. [Encl (4), (20), (22), (24)-(36)]

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49. -44 seconds: Indications of split rudder. Port rudder responding to Helm, starboard rudder remains right 15 degrees with speed 100 RPM both shafts. YUK Master observing ESX turning to starboard and orders YUK to come right to 095 degrees true. [Encl (4), (20), (22), (24)-(39)]
50. -43 seconds: Indications of split rudder. Port rudder responding to Helm, starboard rudder remains right 15 degrees with speed 100 RPM both shafts. [Encl (4), (20), (22), (24)-(39)]
51. -42 seconds: ESX Bridge Team alerted of split rudder condition by Helm Safety Officer. 1A steering unit has failed. ESX gyro is spinning slowly to starboard. ESX is closing YUK. ESX reports split rudder to YUK on bridge to bridge radio, channel 72. ESX CO orders five short blasts and order is executed. ESX speed is 100 RPM on both shafts. [Encl (4), (20), (22), (24)-(39)]
52. -41 seconds: Split between port and starboard rudders is at 30 degrees. Helmsman using left 15 degrees rudder to compensate for split rudder. Gyro spin is to starboard. Speed is at 100 RPM on both shafts. YUK Master hears split rudder on Bridge to Bridge Radio Channel 72 from ESX, but does not respond. YUK Master estimates lateral separation between ESX and YUK is 130 feet. YUK Master orders course 095 degrees true. YUK Master gives five short blasts. YUK Master is now focused on what he believes is a deteriorating, extremis situation on the bow which requires maneuvering on his part and has not responded to the ESX radio calls. [Encl (3) (b)(6) (20), (25), (27), (30)-(36)]
53. -40 seconds: ESX CO orders to shift steering units. ESX Gyro is spinning starboard. ESX Speed is 100 RPM on both shafts. YUK Master is observing the ESX bow coming starboard. [Encl (20), (24), (25), (27)-(34), (36), (38), (39)]
54. -39 seconds: Helmsman responding to orders to the helm. [Encl (30), (32), (34), (36)]
55. -38 seconds: Helmsman brings port rudder amidships in preparation for steering unit shift. ESX gyro is spinning

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starboard at this time. Speed is 100 RPM on both shafts.  
YUK Master is observing the ESX bow coming starboard.  
[Encl (20), (27), (30)-(36)]

56. -37 seconds: Port rudder is amidships. ESX gyro is spinning starboard. Speed is 100 RPM on both shafts, both shafts. YUK Master observing the ESX bow coming starboard.  
[Encl (20), (24), (30)-(36)]
57. -36 seconds: Steering units 1A and 2B are secured and standby steering units 1B and 2A come online. ESX gyro spinning STBD. TW/waves port qtr. YUK Master observing ESX bow coming STBD. ESX CO said "left rudder" or "come left" to the Conning Officer. CO stated he said "left rudder" thinking left standard rudder. CO recalls thinking that he should have corrected the order to a standard command. CONN orders left hard rudder. The CO recalls hearing the CONN Mentor say, "belay that," moments later, but does not know what the CONN Mentor was referring to. (b)(5)  
[Encl (4), (20), (24), (25), (27), (29), (30), (32), (34)-(37), (40)-(48)]
58. -35 seconds: Steering units 1B and 2A online. Starboard rudder conforming to port rudder in amidships position. ESX gyro is spinning starboard. Helmsman returning rudder left full. Speed is 100 RPM on both shafts. YUK Master observing ESX bow coming starboard. ESX bow is 15-20 degrees to starboard as seen from YUK Port bridge wing by YUK Master. YUK Master has decided to maneuver to starboard and slow ship. [Encl (4), (20), (24), (25), (27), (29), (30), (32)-(37), (40)-(48)]
59. -34 seconds: Steering units 1B and 2A online. Starboard rudder conforming to port rudder to left full/hard rudder. ESX gyro is spinning starboard. YUK Master observing ESX bow coming starboard. ESX bow is 15-20 degrees to starboard as seen from YUK Port bridge wing. [Encl (4), (20), (24), (25), (27), (30), (32)-(37), (40)-(48)]
60. -33 seconds: Speed is 100 RPM on both shafts. ESX going left full/hard rudder\*\*. (b)(5)

ESX gyro spinning starboard. Speed 100 RPM on both shafts. YUK Master has decided to maneuver to starboard and slow ship. YUK Master "giving various rudder

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and engine orders." \*\*Note: There are conflicting accounts as to whether the rudder was at left full or left hard. This rudder will be referred to as in this finding of fact going forward. [Encl (20), (29), (30)-(36)]

61. -32 seconds:

(b)(5)

ESX going left hard rudder. ESX gyro spinning starboard. Speed 100 RPM on both shafts. YUK Master "giving various rudder and engine orders." [Encl (27), (28), (30)-(36)]

62. -31 seconds: ESX going left full/hard rudder. ESX gyro spinning starboard. Speed 100 RPM on both shafts. [Encl (20), (24), (30), (32)-(34), (36)]

63. -30 seconds:

(b)(5)

ESX gyro spinning starboard. Speed 100 RPM on both shafts. YUK Master "giving various rudder and engine orders." YUK Master has decided to maneuver to starboard and slow ship. [Encl (20), (24), (30)-(34), (36)]

64. -29 seconds: ESX approaching left full/hard rudder. ESX gyro spinning slower starboard. Speed 100 RPM on both shafts. YUK Master "giving various rudder and engine orders." YUK Master has decided to maneuver to starboard and slow ship. [Encl (20), (24), (30)-(34), (36)]

65. -28 seconds: ESX at left full/hard rudder (beginning approximately 21 seconds of left full/hard rudder). ESX gyro spinning slower slowing STBD. Speed 100 RPM's, both shafts. TW/waves port qtr. YUK Master "giving various rudder and engine orders." YUK Master has decided to maneuver to starboard and slow ship. [Encl (20), (24), (27), (30)-(35)]

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66. -27 seconds: ESX at left full/hard rudder. ESX gyro spinning slower starboard. Speed 100 RPM on both shafts. YUK Master "giving various rudder and engine orders." YUK Master has decided to maneuver to starboard and slow ship. [Encl (20), (24), (30)-(36)]
67. -26 seconds: ESX at left full/hard rudder. ESX gyro spinning slower starboard. Speed 100 RPM on both shafts. YUK Master "giving various rudder and engine orders." YUK Master has decided to maneuver to starboard and slow ship. [Encl (20), (24), (30)-(36)]
68. -25 seconds: ESX at left full/hard rudder. ESX gyro spinning slower starboard. Speed 100 RPM on both shafts. YUK Master "giving various rudder and engine orders." YUK Master has decided to maneuver to starboard and slow ship. [Encl (20), (24), (30)-(34), (36)]
69. -24 seconds: ESX at left full/hard rudder. ESX gyro spinning stopped to starboard. Speed 100 RPM on both shafts. [Encl (30), (32)-(34)]
70. -23 seconds: ESX at left full/hard rudder. ESX gyro begins spinning to port. ESX gyro responding to and manifesting reaction to full/hard left rudder. Speed 100 RPM on both shafts. Venturi effect occurs at approximately 60 to 80 feet. (b)(5) [Encl (20), (23), (24), (30), (31)-(34); Ref (i)]
71. -22 seconds: ESX at left full/hard rudder. ESX gyro spinning to port. Speed 100 RPM on both shafts. YUK attains max STBD course of 099.8 deg true. ESX - YUK lateral separation is approximately 60 feet. (b)(5) [Encl (20), (23), (24), (30), (31) - (34); Ref (k)].
72. -21 seconds: ESX at left full/hard rudder. ESX gyro spinning to port. Speed 100 RPM on both shafts. ESX-YUK lateral separation is approximately 60 feet. (b)(5) [Encl (4), (20), (23), (24), (30), (31)-(34); Ref (i)]
73. -20 seconds: ESX at left full/hard rudder. ESX gyro spinning to port. Speed 100 RPM on both shafts. YUK Master observes "good angle on the bow." (b)(5)

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- (b)(5) [Encl (20), (23), (24), (30)-(34);  
Ref (i)]
74. -19 seconds: ESX at left full/hard rudder. ESX gyro spinning to port. Speed 100 RPM on both shafts. YUK engines ordered stopped. (b)(5)  
[Encl (20), (23), (24), (30)-(34); Ref (i)]
75. -18 seconds: ESX at left full/hard rudder. ESX gyro spinning to port. Speed 100 RPM on both shafts. YUK engines ordered back full. (b)(5)  
[Encl (20), (23), (24), (30)-(34); Ref (i)]
76. -17 seconds: ESX at left full/hard rudder. ESX gyro spinning to port. Speed 100 RPM on both shafts. YUK CPP going from ahead to stop. (b)(5)  
[Encl (20), (23), (24), (30)-(34); Ref (i)]
77. -16 seconds: ESX at left full/hard rudder. ESX gyro spinning to port. Speed 100 RPM on both shafts. YUK CPP going from ahead to stop. Conn Mentor calls for 18 knots. (b)(5) [Encl  
(20), (23), (24), (27), (29), (31)-(33); Ref (i)]
78. -15 seconds: ESX at left full/hard rudder. Lee Helm dials 160 RPM, in response to an order to "indicate 160 RPM," she believes came from a male voice, on the Propeller Order Telegraph (POT), but does not dial the corresponding bell change on the Engine Order Telegraph (EOT). (b)(5)  
EOOW notes the conflict between the POT and EOT and that ESX has never answered 160 RPM since the BHR crew took command of ESX. 160 RPM is recorded in the Bell Log. ESX gyro spinning to port. Speed 100 RPM on both shafts. YUK CPP going from ahead to stop. (b)(5) [Encl  
(21), (23), (30)-(34), (37), (49); Ref (i)]
79. -14 seconds: ESX at left full/hard rudder. ESX gyro spinning to port. Speed 100 RPM on both shafts. POT indicates 160, EOT indicates "Standard." RPM on the Bridge and in the engine room. (b)(5)
- CPP going from ahead to stop. (b)(5) YUK

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- (b)(5) [Encl (20), (21), (23), (27),  
(30)-(34), (37), (49); Ref (i)]
80. -13 seconds: ESX at left full/hard rudder. ESX gyro spinning to port. Speed 100 RPM on both shafts. POT indicates 160 RPM, EOT indicates "Standard." YUK CPP at neutral. (b)(5)  
[Encl (20), (21), (23), (24), (30)-(34), (37), (49); Ref (i)]
81. -12 seconds: ESX at left full/hard rudder. ESX gyro spinning to port. Speed 100 RPM on both shafts. Lee Helm dials 120 RPM on the POT. EOOW sees POT change from 160 RPM to 120 RPM. EOOW has not answered the 160 RPM or the 120 RPM due to the conflict between the POT and EOT. YUK CPP at neutral. (b)(5)  
[Encl (20), (21), (23), (24), (30)-(34), (37), (49); Ref (i)]
82. -11 seconds: ESX at left full/hard rudder. ESX gyro spinning to port. Speed 100 RPM on both shafts. POT indicates 120 RPM. YUK CPP responding to backing bell. (b)(5) [Encl  
(20), (21), (23), (24), (30)-(34), (37), (49); Ref (i)]
83. -10 seconds: ESX at left full/hard rudder. ESX gyro spinning to port. Speed 100 RPM on both shafts. POT indicates 120 RPM. YUK CPP responding to backing bell. (b)(5) [Encl  
(20), (21), (23), (24), (30)-(34), (37), (49); Ref (i)]
84. -9 seconds: ESX at left hard rudder. ESX gyro spinning to port. Speed 100 RPM on both shafts. EOOW calls OOD with respect to POT indications of 160 RPM vs. 120 RPM per the ship's RMD. YUK CPP responding to backing bell. (b)(5)  
[Encl (20), (21), (23), (24), (30)-(34), (37), (49); Ref (i)]
85. (b)(5):
86. -8 seconds: ESX at left full/hard rudder. ESX gyro spinning to port. Speed 100 RPM on both shafts. POT

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indicating 120 RPM. EOOW calling OOD with respect to POT  
indications of 160 RPM and 120 RPM. (b)(5)

[Encl (20), (21), (23), (24),  
(30)-(34), (37), (49); Ref (i)]

87. -7 seconds: ESX at left full/hard rudder. ESX gyro  
spinning to port. Speed 100 RPM on both shafts. POT  
indicating 120 RPM. XO yells "Watch your stern." EOOW  
calling OOD with respect to POT indications of 160 RPM and  
120 RPM. YUK Master orders engines ahead. (b)(5)  
[Encl (20), (21),  
(23)-(25), (28), (30)-(34), (37), (49); Ref (i)]
88. -6 seconds: ESX Master Helm grabs helm & turns rudder to  
amidships - ESX going from left full/hard rudder to rudder  
amidships. ESX gyro spinning to port. Speed 100 RPM on both  
shafts. POT indicates 120 RPM. OOD and EOOW discussing POT  
indications of 160 RPM and 120 RPM. YUK engines responding  
to ahead bell - CPP moving from astern going to pass  
through neutral and stop in an ahead configuration. (b)(5)  
[Encl (20), (21),  
(23)-(25), (30)-(34), (37), (49); Ref (i)]
89. -5 seconds: ESX going to rudder amidships. ESX gyro  
spinning to port. Speed 100 RPM on both shafts. POT  
indicates 120 RPM. OOD and EOOW discussing POT indications  
of 160 RPM and 120 RPM. (b)(5) YUK  
engines responding to ahead bell - CPP moving from astern  
going to pass through neutral and stop in an ahead  
configuration. (b)(5)  
[Encl (20), (23)-(25), (30)-(34), (37), (49); Ref  
(i)]
90. -4 seconds: ESX going to rudder amidships. ESX gyro  
spinning to port. Speed 100 RPM on both shafts. POT  
indicates 120 RPM. OOD and EOOW discussing POT indications  
of 160 RPM and 120 RPM. ESX starboard elevator over YUK  
flight deck. YUK engines responding to ahead bell - CPP  
moving from astern going to pass through neutral and stop  
in an ahead configuration. (b)(5)  
[Encl (20), (23), (24), (30)-(34), (37),  
(49); Ref (i)]
91. -3 seconds: ESX rudder going to amidships. ESX gyro  
spinning to port. Speed 100 RPM on both shafts. POT  
indicates 120 RPM. OOD and EOOW discussing POT indications

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of 160 RPM and 120 RPM. ESX starboard elevator over YUK  
flight deck. ESX CO orders collision alarm. YUK at ahead  
bell - CPP at neutral. (b)(5)

(b)(5) [Encl (20), (23), (24), (29)-(34), (36),  
(37), (49); Ref (i)]

92. -2 seconds: ESX rudder at amidships. ESX gyro spinning to  
port. Speed 100 RPM on both shafts. POT indicates 120 RPM.  
ESX starboard elevator over YUK flight deck. YUK ahead bell  
- CPP moving ahead. (b)(5)

[(Encl (20), (23), (24), (30)-(34); Ref (i)]

93. -1 seconds: ESX rudder at amidships. ESX gyro spinning to  
port. Speed 100 RPM on both shafts. POT indicates 120 RPM.  
ESX starboard elevator over YUK flight deck. Collision  
alarm activated. YUK ahead bell - CPP moving ahead.

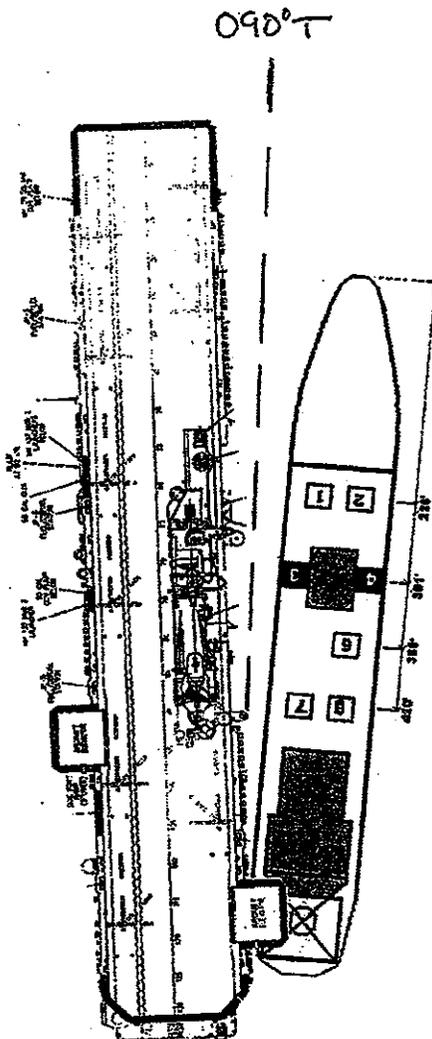
(b)(5) [Encl  
(20), (23), (24), (30)-(34); Ref (i)]

94. 0.0 seconds: ESX collision starboard side. Port &  
starboard rudders at amidships in the positions  
approximately depicted in figure 1 below. Speed 100 RPM on  
both shafts. POT indicates 120 RPM. ESX heading  
approximately 085 degrees true. YUK Master estimates SOG  
of 8 knots. YUK ahead bell - CPP moving ahead. YUK course  
is 099.8 degrees true. [Encl (20), (22), (24), (27)-(39)]

95. +0-20 seconds: ESX and YUK hover together at the stern  
(starboard and port quarters). ESX rudder at amidships.  
[Encl (20), (24), (25), (27), (29), (31), (32), (34)]

96. +21 seconds: ESX and YUK continue to hover together. ESX  
Main Control responding to speed change from 100 RPM to 120  
RPM at throttle valve. ESX rudder amidships. [Encl (20),  
(25), (27), (29), (32)-(34), (49)]

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**FIGURE I: Collision Point for USS ESSEX (LHD 2) and  
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97. +22-60 seconds: ESX and YUK continue to hover together.  
ESX increasing speed. ESX rudder amidships. [Encl  
(3) (b)(6) , (32), (34), (49)]

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98. +61 seconds: ESX achieving breakaway speed. ESX rudder amidships. Venturi effect overcome. [Encl (3) (b)(6), (20), (30), (32), (34)]
99. +62 seconds: ESX-YUK opening. ESX rudder amidships. [Encl (3) (b)(6), (32), (34)]
100. +63 seconds: ESX-YUK opening. ESX rudder amidships. [Encl (3) (b)(6), (32), (34)]
101. +64 seconds: ESX-YUK opening. ESX OOD tells Conn to steady on course 085T. [Encl (20), (25), (30), (32), (35)]
102. There were no bridge to bridge communications logged in the Bridge to Bridge Communications Log. Therefore, all bridge to bridge communications are based on witness statements. [Encl (50)]

#### IV. FOLLOW-ON ACTIONS

103. ESX did not set General Quarters following the collision, as required by the ship's standing orders. However, ESX did take action to ensure all personnel were accounted for and that appropriate damage control measures were taken. [Encl (3)]
104. Damage assessment commenced and photographed. [Encl (20), (51)]
105. CO, ESX has all watch standers write statements regarding the incident. [Encl (20), (24), (25), (27)-(30), (34)-(49), (52)]
106. ESX attempts to recreate the split rudder condition that began the chain of events leading up to the collision. When 1A SGU is energized, the starboard rudder immediately goes to 20 degrees right and sticks. The Helm goes left rudder. The port rudder is responsive and goes left, but the starboard rudder remains at 20 degrees right. 1A/2B SGUs are secured, standby units, 1B/2A start and the starboard rudder returns to amidships. In this SGU configuration, the Helm has positive control of the starboard rudder in both directions. This recreation is performed a second time with the same results. Indicators in after steering match those on the Bridge. [Encl (53)]

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107. The cause of the steering casualty was determined to be a failed solenoid valve. This was confirmed by a SWRMC Tech Assist Report. [Encl (54)]
108. An Inservice Engineering Assessment (ISE) advisory for nuclear powered aircraft carriers was issued in 2010 which identified problems with the same solenoid valves used in LHD steering units. The ISE advisory requires these solenoids to be replaced every 24 months. [Encl (55)]

OPINIONS

(b)  
(5)

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(b).  
(5)

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(b)(5)

2. **ERROR CHAIN ANALYSIS.** Further analysis can be illustrated as an "Error Chain:" (Adams) that contributed to a higher risk underway replenishment evolution than what could have been better and optimally planned for. The Error Chain sequence was:
  - a. ROMEO CORPEN 090 Degrees True: executed refueling evolution with port quartering seas (6 foot swells from 320 degrees true) and winds (300 to 310 degrees true. This caused on setting seas and winds on ESSEX port quarter characterized as Beaufort Scale Five. The ESSEX Master Helmsman U/I is using in excess of 20 degrees of left and right rudder to remain on ordered courses in quartering seas as compensation for those quartering seas. Of note, operational planning in support of promulgated schedule(s) determined UNREP course and speed.
  - b. When the steering casualty occurred, ESSEX was then being pushed toward YUKON, thus accounting for the environmental conditions that contributed to ESSEX moving closer to YUKON, and entering the confluence of Venturi Effects, while ESSEX is attempting to regain control of steering. However, regaining steering control did not avoid collision due to the close proximity of ESSEX to YUKON and within the perimeter of the Venturi Effect.

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(5)

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(b) (5)

- d. The Commanding Officer of ESSEX failed to vigorously and directly respond to the steering casualty. When the steering casualty was reported to the bridge watch team, the Commanding Officer was expected to have immediately provided loud, vigorous, and direct orders to the Conning Officer and Officer of the Deck concerning his intentions to avoid further approach or collision with YUKON (Stavridis - Command at Sea). Rather, as the steering casualty challenged the skills of a junior and inexperienced watch team to include the Commanding Officer, the Commanding Officer assumed a more passive role guiding the watch team in effectively responding to the steering casualty. The confusion and breakdown of bridge team cohesion, loss of situational awareness, and loss of command and control (C2) effectiveness was directly related to the Commanding Officer not taking bold and unambiguous control of the developing collision incident.
- e. A very junior ESSEX Watch Team that lacked the experience which may have allowed them to react and respond to such a quick and severe steering casualty while alongside YUKON. Split Rudder (jammed rudder) is not a standard steering casualty that is practiced in simulation. This lack of opportunity to train for this particular and exact casualty scenario is mainly attributable to the NSST simulator limitations (at SWOS Newport and LB&B in San Diego) of being incapable of precisely modeling a split rudder scenario alongside a Kaiser Class T-AO.

f.

(b) (5)

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(b)(5)

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(b) (5)

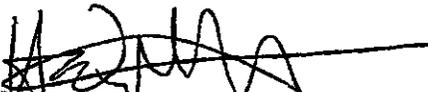
RECOMMENDATIONS

(b) (5)

in the case of the Commanding Officer for failing to maintain effective Command and Control (C2). The Commanding Officer of ESSEX failed to vigorously and directly respond to the steering casualty by assuming a passive role on the Bridge as the casualty unfolded. When the steering casualty was reported to the bridge watch team, the Commanding Officer was expected to silence the Bridge and immediately provide loud, vigorous, and direct orders to the Conning Officer and Officer of the Deck concerning his intentions to avoid further approach or collision with YUKON (Stavridis - Command at Sea). Rather, as the steering casualty challenged the skills of a junior and inexperienced watch team to include the Commanding Officer, the Commanding Officer assumed a rule by negation posture in guiding the watch team in effectively responding to the steering casualty. The confusion and breakdown of bridge team cohesion, loss of situational awareness, and loss of command and control (C2) effectiveness was directly related to the Commanding Officer not taking bold and unambiguous control

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of the Bridge as the casualty developed.

  
H.N. QUINTANILLA II