1. FINDINGS AND RECOMMENDATIONS

Finding 1 (Present and Contributing: Human Error-Individual Failure):

While conducting night reconnaissance operations using night vision goggles (NVGs) and the mast-mounted sight (MMS), the PC and PI of the OH-58D(R) did not properly coordinate. That is, the crew did not indicate to each other when they were inside or outside the aircraft as prescribed in TC 1-248, paragraph 6-3. The Board concluded that the PC was flying and looking out of the right side of the aircraft and the PI was looking inside the aircraft. Neither pilot confirmed where he was looking. As a result the PC flew the aircraft into wires that were depicted on the wire hazards map and were known to be present by the crew. The aircraft was destroyed, the PI received serious injuries, and the PC received fatal injuries.

The Board concluded that the crew's actions were a result of overconfidence and excitement. The crew knew the area very well and had almost completed a tour of duty flying combat missions in theater. The accident crewmembers had flown together often and were overconfident in each other's abilities. The Board also concluded that the crew was concentrating so intensely on supporting the ground element that they forgot where they were relative to the wires.

RECOMMENDATION 1:

a. Unit Level Action: Commander, C-Troop, 1-3 Calvary, 3d Aviation Brigade, 17th Cavalry Division:

   (1) Brief all assigned and attached personnel on the facts and circumstances surrounding this accident.
   
   (2) Ensure all assigned and attached pilots adhere to all published aircrew training manual procedures.

b. Higher Level Action: Commander, 3d Aviation Brigade, 17th Calvary Division: Continue enforcing the published risk management procedures, policies, and guidance on proper crew coordination.

c. DA Level Action: None

(See continuation sheet)

2. CODED SUMMARY OF ACCIDENT FINDINGS, SYSTEM INADEQUACIES, AND RECOMMENDATIONS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Duty: PC</td>
<td>(2) Role: V</td>
<td>(3) Phase of Operation</td>
<td>(4) ATM Task No. 1926</td>
</tr>
<tr>
<td>(1) PI</td>
<td>(2) Role: V</td>
<td>(3) Phase of Operation</td>
<td>(4) ATM Task No. 1926</td>
</tr>
<tr>
<td>(1) PI</td>
<td>(2) Role: V</td>
<td>(3) Phase of Operation</td>
<td>(4) ATM Task No. 1926</td>
</tr>
</tbody>
</table>

(See continuation sheet)
3–5. DA Form 2397–2, Part III, Findings and Recommendations

a. DA Form 2397–2 (see fig 3–4) will be completed for all aircraft accidents requiring a technical report. (See tables 3–3 through 3–7 for additional information.) If additional space is required, use letter-size paper for continuation sheets.

(1) This form is designed to provide a narrative and coded summary of accident cause factors, system inadequacies, and corrective actions.

(2) Block 1 is used to explain block 2 in terms of what happened, why it happened, and what should be done to reduce the chances of it happening again (“3W” approach).

b. An abbreviated list of the codes and associated mistakes/errors, materiel malfunctions, environmental conditions, system inadequacy(ies) and corrective actions is provided at table 3–7. Appendix B contains expanded descriptions and examples of the abbreviated codes.
a. Also see paragraph 3–5.
b. Complete instructions as follows:
(1) **Block 1.** Instructions for reporting findings and recommendations. Each finding must be substantiated by the written analysis portion of the narrative (DA Form 2397–3). Findings fall into one of five categories:
(a) Present and contributing.  
(b) Suspected present and contributing.  
(c) Present and contributing to the severity of the injury/occupational illness or extent of property damage.  
(d) Present but not contributing.  
(e) Special observations. (This is noted at the end of the narrative only.)
1. **Findings.** As a minimum, the following elements of information will be addressed for each Present Contributing, Suspected Present Contributing, and Present Contributing to the Severity of Injury/Occupational Illness or Extent of Damage finding in the order stated. See table 3–1.  
   a. An explanation of when and where the error, materiel failure, or environmental factor occurred in the context of the accident sequence of events. For example, “During preflight,” “During takeoff,” “While employing.”  
   b. Identification of the individual involved by duty position; or the name and PN or NSN of the part, component, or system that failed; or a description of the environmental factor, as appropriate.  
   c. For human error, identification of the task or function the individual was performing and an explanation of how it was performed improperly. Refer to appendix B, table B–1 for mistake/error categories. The error could be one of commission or omission. For example, an individual performed the wrong task, incorrectly performed the correct task, or failed to perform a required task or function. In the case of a materiel failure, identify the mode of failure. Refer to appendix B, table B–3 for material failures/malfunctions. For example, corroded, burst, twisted, decayed. Enter only one task error, malfunction or environmental condition code per present and contributing factor.  
   d. Identification of the directive, (for example, ATM, SOP, Field Manual (FM)) or common practice governing the
performance of the task or function. In lieu of a written directive, the error may represent performance that is contrary to common practice.

e. An explanation of the consequences of the error, materiel failure, or environmental effect. An error may directly result in damage to equipment or injury/occupational illness to personnel, or it may indirectly lead to the same end result. A materiel failure may have an immediate effect on equipment or its performance, or it may create circumstances that cause errors resulting in making further damage/injury or occupational illness inevitable.

f. Identification of the reasons (system inadequacy(ies)) the human, materiel, environmental conditions contributed to the accident. Refer to the list and examples of system inadequacy(ies) provided in appendix B, table B–5. The present and contributing finding may contain multiple system inadequacies (training, individual, leader, and so forth).

g. A brief explanation of how each reason contributed to the error, materiel failure, or environmental factor.

h. In addition, for Present and Contributing to the Severity of Injury/Occupational Illness or Extent of Damage findings, the board should also: (1) Report those factors that contributed to the severity or injury or extent of damage; (2) Summarize personnel injuries attributable to the defects in support equipment, PPE or crashworthiness design as findings in this category; (3) Address injuries sustained from failure to provide equipment; for example, seatbelts; (4) Separate the findings and recommendations in this category from those that caused the accident and precede them with the following statement: “THE FINDING(S) LISTED BELOW DID NOT DIRECTLY CONTRIBUTE TO THIS ACCIDENT; HOWEVER, IT/ THEY DID CONTRIBUTE TO THE (SEVERITY OF INJURIES) OR (ACCIDENT DAMAGE)."

i. Present but Not Contributing findings are those that did not cause or contribute to the accident or to the severity of injuries: (1) The board should report errors, materiel failures, or other hazards that did not contribute to the accident, but have a high potential for causing other accidents or adversely affecting the safety of personnel and equipment if not corrected. Reporting these deficiencies will ensure they receive command attention throughout the chain of command to include DA-level action; (2) The findings and recommendations in this category will be separated from those that caused the accident or those that did not cause the accident but contributed to the severity of injuries, and will be preceded by the following statement: “THE FINDING(S) LISTED BELOW DID NOT CONTRIBUTE TO THIS ACCIDENT; HOWEVER, IF LEFT UNCORRECTED, IT/ THEY COULD HAVE AN ADVERSE EFFECT ON THE SAFETY OF FUTURE OPERATIONS.”

2. Recommendations. Each finding will be followed by recommendations having the best potential for correcting or eliminating the reasons (system inadequacy(ies)) for the error, materiel failure, or environmental factor that contributed to the accident and for each Present but not Contributing finding that might have an adverse effect on the safety of future operations. Recommendations will not focus on punitive steps addressing an individual’s failure in a particular case. To be effective at preventing accidents in the future, recommendations must be stated in broader terms. Refer to the list of remedial measures in Appendix B. The board should not allow the recommendation to be overly influenced by existing budgetary, material, or personnel restrictions. In developing the recommendations, the board should view each recommendation in terms of its potential effectiveness. For example, design improvement of a part that has a history of recurring failure is a better solution than recommending procedures to accommodate the deficiency. Each recommendation will be directed at the unit, command, or activity having proponency for and which is best capable of implementing the actions contained in the recommendation. The actions required at unit level (company, troop, battalion), higher level (brigade, division, corps, Army Headquarters), and DA (to include Army Headquarters with Army-level proponency) levels of command will be addressed by each recommendation. If one or more of these three command levels had no action requirement, a negative report is required. For example, “DA Level Action: None,” “Unit Level,” “Higher Level,” and “DA Level” of action, as used in this context, respectively refer to the unit deemed most responsible for the accident (the unit’s chain of command, up to and including Army Headquarters, and DA-level activities.) In cases where an Army Headquarters is the highest level proponent for a recommended action having Army-wide application, the Army Headquarters will be listed in the “DA Level” category.

(2) Block 2. Enter a coded summary of the present and contributing findings and recommendations to include duty, role, phase of operation, mistake/errors, ATM tasks, system inadequacy(ies). Blocks 2a, 2b, and 2c pertain to personnel error, block 2d pertains to materiel failure or malfunction, and block 2e pertains to environmental effects or influence. All entries in block 2 will be consistent with and supported by the present and contributing findings reported in block 1 or the continuation sheet.

(a) Block 2a(1), Duty. Enter the code for the individual’s duty position at the time the mistake/error was made. Refer to table 3–5 for codes to be used.

(b) Block 2a(2), Role. Check “D” for definite or “S” for suspected to indicate the contributing role of this individual.

(c) Block 2a(3), Phase of Operation. Enter the code for the phase of operation that was in progress at the time the mistake/error occurred (may be different from emergency or accident phase of operation). Refer to table 3–4 for codes to be used.

(d) Block 2a(4), Aircrew Training Manual Task No. Enter the ATM task number being performed at the time the mistake/error was made. Enter “NA” if no ATM task applies.

(e) Block 2a(5), Mistake/Error. In the space provided, enter the code of the mistake/error that best categorizes the error made by this individual. Enter only one code.
Note. An abbreviated list of codes and associated mistake/errors, system inadequacy(ies), corrective measures, materiel failures, and environmental conditions is provided at table 3–7 and/or appendix B, which contains expanded descriptions and examples of the abbreviated codes. Also, prefix corrective codes with “U” for unit, “H” for higher, and “A” for DA to indicate the level of command to which the remedial action is directed.

(f) System inadequacy(ies). In the spaces provided, enter the numerical codes of the system inadequacy(ies) that caused or permitted the mistake/error to become an accident cause factor. If there are more than three system inadequacy(ies) associated with the first mistake/error, skip the second duty and mistake/error entries and continue to list the additional system inadequacy(ies) spaces. (See table 3–7 and app B).

(g) Remedial corrective measures/recommendations. In the spaces provided to the right of each system inadequacy(ies), enter the codes for the corrective measures selected to correct that specific system inadequacy. (See table 3–7 and app B).

(h) Continue entries. Continue the entries in blocks 2a, b, and c until all personnel who made errors contributing to the accident, specified in the present and contributing findings of block 1 above, have been coded. If number of entries exceeds space available, use blocks 2a, b, and c of an additional DA Form 2397–2 to continue entries. For each duty code entered in blocks 2a, b, and c, ensure that a DA Form 2397–8 is completed for each individual.

(i) Block 2d, Materiel. An entry is required for all materiel failure(s)/malfunction(s) that caused or contributed to the accident as specified in the present and contributing findings of block 1 above. If more than one materiel failure was involved, use block 2d of an additional DA Form 2397–2 to continue entries.

(j) Block 2d(1), Role. Check “D” for definite, or “S” for suspected to indicate the materiel role in the accident.

(k) Block 2d(2), Phase of Operation. Enter the code for the phase of operation that was in progress at the time of failure/malfunction. Refer to table 3–4 for codes to be used.

(l) Block 2d(3), Failed part number. Enter the manufacturer’s PN. The number should coincide with the PN listed in block 3c of DA Form 2397–7.

(m) Block 2d(4), Failure code. Enter the code that best describes the materiel failure category. (See table 3–7 and app B).

(n) System inadequacy(ies). Enter the codes of the system inadequacy(ies) that caused or permitted the materiel failure/malfunction to become an accident cause factor. If system inadequacy(ies) identifying improper maintenance are selected, such as system inadequacies 13 and 14, and the duty code of the individual(s) can be identified, a resultant finding should be written as a human mistake/error and consider the failure/malfunction as a result of human mistake/error instead of a materiel failure. The mistake/error would then be recorded in block 2a, b, and/or c.

(o) Remedial corrective measures/recommendations. Enter codes for corrective measures in the spaces located to the right of each system inadequacy(ies).

(p) Block 2e, Environmental. This block is to summarize causal environmental conditions that had an adverse effect on human or equipment performance as related to the accident. Examples include unpredictable weather phenomena (wind/turbulence) resulting in airframe damage; bird strikes damaging aircraft. For the environment to be considered to have caused or contributed to an accident, it must have been unavoidable or unknown at the time of the accident. If the environment does not meet the criteria, a human mistake/error of failure to compensate for known or suspected conditions must be considered. If more than one environmental factor was involved, use block 2e of an additional DA Form 2397–2 to continue entries.

(q) Block 2e(1), Role. Check “D” for definite, or “S” suspected to indicate the environmental role in the accident.

(r) Block 2e(2), Phase of Operation. Enter the code for the phase of operation that was in progress at the time the environmental factor caused or contributed to the accident.

(s) Block 2e(3), Condition code. Enter the code for the environmental factor. (See table 3–7 and app B).

(t) System inadequacy(ies). Enter the code of the system inadequacy that caused or permitted the environmental factor to become an accident cause.

(u) Remedial corrective measures. Enter corrective measure codes in the spaces located to the right of each system inadequacy(ies).

(3) Block 3. Enter the case number as shown on the DA Form 2397–1 (see table 3–6).
Table 3–1A
Elements of a human error present and contributing finding

FINDING (Present and Contributing: Human Error – Individual Failure):

<table>
<thead>
<tr>
<th>Required Information</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Explanation of when and where the mistake/error occurred in context of the accident sequence of events.</td>
<td>While conducting day, nap-of-the-earth aircrew training at 50 feet above ground level (AGL) and 10 knots indicated air speed (KIAS)…</td>
</tr>
<tr>
<td>2. Aircraft and individual involved by duty position.</td>
<td>the Pilot in Command (PC) and Pilot (PI) of the UH-60…</td>
</tr>
<tr>
<td>3. Identification of mistake made (ref aviation-specific mistakes/errors in DA PAM 385-40, Table B-1) and an explanation of how task/activity was performed improperly. NOTE: Only one mistake/error per finding.</td>
<td>improperly scanned. That is, both crewmembers failed to properly scan for obstacles when they both became visually fixated on an animal on the ground…</td>
</tr>
<tr>
<td>4. Directive (ATM, SOP, FM, TM, and so forth) or common practice governing performance of task/activity.</td>
<td>in contravention of TC 1-237, Task 2026.</td>
</tr>
<tr>
<td>5. Consequences of mistake/error.</td>
<td>As a result, the aircraft main rotor blades were damaged when they made contact with a tree at approximately 50 feet AGL. There were no injuries.</td>
</tr>
<tr>
<td>6. Identification of reasons (root causes/system inadequacies) for the mistake/error (ref System Inadequacies in Table B-5 of DA PAM 385-40). NOTE: The finding may contain multiple System Inadequacies (Individual, Standards, Leader, etc.)</td>
<td>The PC’s and PI’s actions were a result of overconfidence in each other’s ability to clear the aircraft and maintain obstacle clearance.</td>
</tr>
<tr>
<td>7. Brief explanation of how each reason (root cause/system inadequacy) contributed to the mistake/error.</td>
<td>The PC and PI allowed the aircraft to fly too close to known obstacles resulting in damage to the main rotor blades.</td>
</tr>
</tbody>
</table>

Notes:
1. FINDING 1: (Present and Contributing: Human Error- Individual Failure): While conducting day, nap-of-the-earth aircrew training at 50 feet AGL and 10 KIAS, the PC and PI of the UH-60L improperly scanned. That is, both crewmembers failed to properly scan for obstacles when they both became visually fixated on an animal on the ground in contravention of TC 1-237, Task 2026. As a result, the aircraft main rotor blades were damaged when they made contact with a tree at approximately 50 feet AGL. There were no injuries. The PC’s and PI’s actions were a result of overconfidence in each other’s ability to clear the aircraft and maintain obstacle clearance. The PC and PI allowed the aircraft to fly too close to known obstacles resulting in damage to the main rotor blades.

Table 3–1B
Elements of a materiel failure present and contributing finding

FINDING (Present and Contributing: Materiel Failure):

<table>
<thead>
<tr>
<th>Required Information</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Explanation of when and where the materiel failure/malfunction occurred in the context of the accident sequence of events.</td>
<td>During engine run-up of the CH-47D with rotor blades turning…</td>
</tr>
<tr>
<td>2. Name and PN or NS of the part, component or system that failed.</td>
<td>the retention bolts (P/N NAS624H-5) securing the fixed droop stop to the aft rotor system red blade pitch shaft…</td>
</tr>
<tr>
<td>3. Mode of failure (corroded, burst, twisted, decayed, etc.)(see DA PAM 385-40, Appendix B, Table B-3 for definitions and examples) NOTE: Only one failure per finding.</td>
<td>The pressure on the engaged threads allowed the threads to strip from the nuts.</td>
</tr>
<tr>
<td>4. Consequences of materiel failure.</td>
<td>The pressure on the engaged threads allowed the threads to strip from the nuts. This failure allowed the fixed droop stop and bolts to separate from the aircraft. As a result, during shutdown, with both engine condition levers at stop and the main rotor blades coasting slowly, the aircraft red main rotor blade contacted the fuselage…</td>
</tr>
<tr>
<td>5. Identification of reasons (root causes/system inadequacies) materiel failure/malfunction caused or contributed to accident. NOTE: The finding may contain multiple System Inadequacies (Design, Manufacture, and so forth).</td>
<td>The droop stops failed due to improper installation by the manufacturer during aircraft overhaul.</td>
</tr>
</tbody>
</table>
Table 3–1B
Elements of a materiel failure present and contributing finding—Continued

6. Brief explanation of how each reason (root cause/system inadequacy) contributed to materiel failure/malfunction.

That is, the bolts (P/N NAS624H-5) installed in the separated fixed droop stop, though nearly identical in appearance, were 1/8-inch shorter than the bolts (P/N NAS624H-7) required by TM 55-1520-240-23P1.

Notes:

1 FINDING 1 (Present and Contributing: Materiel Failure). During engine run-up of the CH-47D with rotor blades turning, the retention bolts (P/N NAS624H-5) securing the fixed droop stop to the aft rotor system red blade pitch shaft failed. The pressure on the engaged threads allowed the threads to strip from the nuts. This failure allowed the fixed droop stop and bolts to separate from the aircraft. As a result, during shutdown, with both engine condition levers at stop and the main rotor blades coasting slowly, the aircraft red main rotor blade contacted the fuselage, resulting in minor fuselage and main rotor blade damage. The droop stops failed due to improper installation by the manufacturer during aircraft overhaul. That is, the bolts (P/N NAS624H-5) installed in the separated fixed droop stop, though nearly identical in appearance, were 1/8-inch shorter than the bolts (P/N NAS624H-7) required by TM 55-1520-240-23P1.

Table 3–1C
Elements of an environmental factor present and contributing finding

FINDING (Present and Contributing: Environment):

<table>
<thead>
<tr>
<th>Required information</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Explanation of when and where the environmental factor occurred in the context of the accident sequence of events.</td>
<td>While ground-taxiing to the parking ramp…</td>
</tr>
<tr>
<td>2. Aircraft and if applicable, the individual(s) involved by duty position.</td>
<td>the AH-64D…</td>
</tr>
<tr>
<td>3. Description of environmental factor encountered (see DA PAM 385-40, Appendix B, Table B-4 for definitions and examples).</td>
<td>encountered an unforecast sudden microburst with winds exceeding 80 knots.</td>
</tr>
<tr>
<td>4. Consequences of environmental effect.</td>
<td>As a result, the aircraft became airborne in a nose-low condition and subsequently entered a right spin from which the crew was unable to recover.</td>
</tr>
<tr>
<td>5. Explanation/identification of reason(s) environmental conditions caused the accident.</td>
<td>Microbursts are environmental events that cannot be seen or forecasted with present meteorological measuring equipment nor are they visible to aircraft crewmembers. They are normally a phenomenon associated with thunderstorms; however, there were no thunderstorms reported or visible in the vicinity.</td>
</tr>
</tbody>
</table>

Notes:

1 FINDING 1 (Present and Contributing: Environment). While ground-taxiing to the parking ramp, the AH-64D encountered an unforecast sudden microburst with winds exceeding 80 knots. As a result, the aircraft became airborne in a nose-low condition and subsequently entered a right spin from which the crew was unable to recover. The aircraft struck the ground causing aircraft damage and injuring one crewmember. Microbursts are environmental events that cannot be seen or forecasted with present meteorological measuring equipment nor are they visible to aircraft crewmembers. They are normally a phenomenon associated with thunderstorms; however, there were no thunderstorms reported or visible in the vicinity.