

Nav Nightmare

Two UH-1N helicopters were on a night vision goggles (NVG) navigation training flight at an overseas shore base. The weather was clear with visibility seven miles and a distinct horizon with visible starlight. The same aircraft had flown a day hop in the general area.

The Naval Air Training and Operating Procedures Standardization checklist was used in the briefing, but NVG mission briefing checklist/notes were not used. The lead pilot, also the mishap pilot (MP), briefed from memory although squadron standard operating procedure called for use of the checklist for all missions. But the other pilots felt the 45-minute brief was thorough. Two checklist items were not discussed: barriers/limiting features and crew coordination.

NVG navigation cards prepared by the lead pilot were handed out during the brief. The *Hueys* would fly at 90 knots, 500 feet above ground level. Also, the copilot in the second *Huey* (mishap wingman copilot, MWCP) was assigned to navigate the route in reverse after the second leg.

The post-sunset takeoff was normal. The MP was navigating from the left seat with the copilot (MCP) at the controls.

The first three points were found easily. Goggling occurred between points three and four. At point four, the lead aircraft circled once and took up a heading of 310 degrees although the nav card called for 290 degrees.

Over the intercommunication system, the MWCP told his pilot of the discrepancy in heading and asked for a check of radio magnetic indicator alignment with the wet compass. The MWP (mishap wingman pilot) confirmed that the alignment was O.K. The lead aircraft continued on a heading of 310. The nav card indicated time to checkpoint five was 5 minutes, 20 seconds. The MWCP told his pilot, "I think they (lead aircraft) are going outside the training area right now."

At the six-minute point on the leg, the flight reached a certain mountain and turned to 240 degrees. The MWCP saw a northern opening of a canyon and told his pilot, "We're off the map."



Next, the lead helo reversed course and flew back "onto" the primary navigation map. The MWCP felt the lead aircraft was looking for the canyon which lead directly to the next checkpoint. The lead aircraft reversed course again and flew off the map toward the northwest. The MWCP and MWP discussed using "Magellan," the code word for "check your navigation, correction needed."

They decided to wait a few moments before calling Magellan. (The reason for this derived from an incident that afternoon during a training flight with the same two aircraft. On the flight line after landing, the MP had harshly criticized the second aircraft's crew for its radio discipline.)

About a minute later, over the intercommunication system, the crew chief under training in the second *Huey* reported wire towers on the right. The MWP then saw a power line tower and began a climb. Neither the tower nor the wires were marked with balls or lights. At the same time, the MWP and MWCP saw sparks coming off the lead helo. (The sparks were only visible through goggles.) The wing aircraft flew past the lead aircraft, which had struck the lines.

The lead aircraft's nose yawed left and aircraft speed decreased. The *Huey* lurched forward, rolled right, and impacted the ground. It exploded, killing all five personnel onboard.



Grampaw Pettibone says:

The investigators came up with those four ominous words to define the cause of this terrible crash: loss of situational awareness.

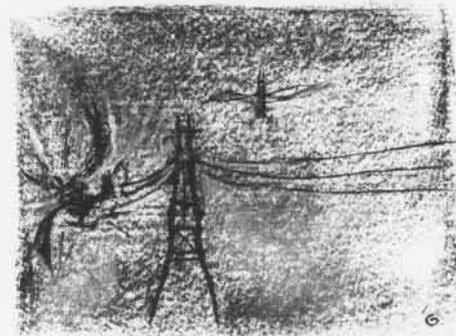
Lack of crew coordination was apparent. The crew got lost. It's as simple and as complicated as that.

The lead pilot failed to follow lost plane procedures, which include determining prominent terrain features, reversing course to the last checkpoint, climbing to establish a tactical air navigation system fix, or asking the wingman for help.

We don't know if there were other problems encountered in the aircraft. The lead pilot planned the mission by himself and then told his wingman's copilot at the preflight briefing that he was responsible for navigating the course in reverse. The lead pilot did not brief the mission in sufficient detail. Wingman responsibility in assisting navigation (Magellan), for instance, was not discussed. There was that NVG briefing from memory vice checklist or written notes. The nav card called for 290 degrees after checkpoint five but the leader headed 310 degrees. Maybe the radio magnetic indicator wasn't aligned before departure.

During the afternoon flight, the lead aircraft approached a restricted area and the wingman called Magellan and advised a course change. Also, when the lead called for landing clearance he missed the clearance call from the tower and the wingman advised him they were cleared inbound.

There was the "encounter" after



landing on the day hop described above. Yet the conduct of the MP in reprimanding the others was considered completely out of character for the lead pilot who later apologized. However, this incident affected the second helo's pilots with respect to delaying the Magellan call that night.

Additionally, a few days earlier, the MP had expressed his philosophy about calling Magellan. He felt it was important to allow the lead aircraft to correct his own error and establish himself on course by working it out on his own, if possible. The squadron C.O. became aware of this philosophy and reinforced the unit's policy on the responsibility of wingmen: When lead is off course and not making proper and timely corrections, call Magellan.

Excellent advice.

Hornet Horror

Three F/A-18 *Hornets* launched on a daytime air combat maneuvering/intercept flight. The opposition, an F-4 and an F-14 which proceeded independently, were not directly involved in the mishap.

As briefed, the lead *Hornet* proceeded 8 to 10 miles ahead of the trail section. The trail, or second, section was to maintain "resolution cell" formation, the wingman to maintain a loose tactical wing position on the section leader. The trio proceeded to establish this disposition for the initial intercept maneuver.

The flight leader commenced a left, 180-degree turn to establish a southerly intercept heading. The second section leader also turned left, lagging the leader's aircraft through 75 degrees of turn. The section leader saw his wingman on his right side at this time.

The section leader then called, "Let's come right," in order to accomplish a 270-degree right turn to establish an 8-to-10-mile trail on the lead aircraft.

"O.K.," responded the wingman. The wingman moved from his right position to cross above and to the left of the section leader in the turn. As the section was turning through a southeasterly heading the wingman called, "Three not visual."

The section leader transmitted, "Two's at 22,000."

"Roger," replied the wingman.

The section leader said he was "on the western side of the ridge," referring to the terrain below.

"Looking," said the wingman.

The section leader said he was nine miles in trail of the flight leader.

"Roger," said the wingman, at which time he left his position, estimated to be 2,000 feet above and to the left of the section leader, in a descent on a southerly heading.

As the flight leader was commenting on slow-moving traffic 15 miles to the north, just under 22,000 feet, the wingman impacted the section leader's *Hornet*. The wingman was killed on impact when the aircraft sustained heavy damage to the nose section.

The wingman's aircraft went into a nose-high, right-wing-down attitude above and to the right of the section leader, then descended in a near vertical path until it crashed into the ground. The last five seconds of the stricken aircraft's mission computer data indicated the *Hornet* had passed 22,500 feet in a minus-16-degree attitude at nearly 400 knots. At this time, the aircraft was in a 36-degree right angle of bank with a 12-degree-per-second left roll rate.

The section leader's aft underside and left engine were damaged in the collision and hydraulic systems associated with the left engine failed immediately upon impact. The aircraft was controllable but somewhat unstable. Multiple flight control system caution lights and left engine fire light were on. The pilot tried to move the left throttle to the off position but was unable to do so.

The aircraft became more unstable, although the right engine was operating normally with respect to rpm and exhaust gas temperature. However, the pilot was unable to maintain level flight.

The flight leader joined on the section leader and noted flames, approximately the length of the aircraft, coming from the left engine area. Nozzle and afterburner sections were missing from both engines. The underside

was blackened. The section leader rechecked the left fire light and found it had not been depressed on an initial attempt. He immediately pressed the fire light and the fire extinguisher ready light. The fire went out.

The aircraft was now at 220 knots with a 3,000-fpm descent. The pilot attempted unsuccessfully to reset the flight controls. He dumped fuel after the fire was out and realized he would be unable to reach a divert field. He ejected passing through 5,000 feet and was later rescued unhurt.



Grampaw Pettibone says:

A sorrowful story, this one. All pilots involved, including the officer killed, were highly qualified, seasoned professionals. Yet the mishap wingman failed to maintain safe separation from his section leader during the turn, and it cost him his life. Further analysis indicated that he descended rapidly during a 6 to 14-second period, from just above 24,000 feet to the midair point just below 22,000. His rate of descent was between 8,000 and 15,000 fpm.

He mighta misread the section leader's position call. He mighta missed seein' lead during a quick "belly check." Or he mighta descended through the section leader's altitude so as to "put" the section leader on or above the horizon - to help find him again.

Plots of the aircraft's altitudes show that the wingman may have crossed 2,000 feet above the leader in the turn and lost him shortly thereafter. He may even have gotten ahead of him, meaning the section leader was at his six o'clock.

Bottom line: A seemingly minor mistake produced a tragedy and a loss of two top-of-the-line flying machines.

We gotta remember: No matter how great one's credentials, it's a wise flier who always assumes that the worst can happen to him if he makes even the slightest mistake up there in the burnin' blue.

