

AIRCRAFT ACCIDENT INVESTIGATION REPORT

1. Authority: Under the provisions Air Force Regulation (AFR) 110-14, the Ninth Air Force Commander appointed Lieutenant Colonel Patrick T. Sakole (TAB Y-1) to conduct an investigation of the aircraft incident on 13 March 1989 in which live ordnance was dropped from an F-16C (SN 83-1157) and detonated in close proximity to manned threat site A-63, approximately 8 nautical miles (NM) south southwest of Millan, Nevada. The investigation was conducted from 3 April to 1 May 1989. Technical advisors were Lieutenant Colonel Harry A. Guzman and Captain David E. E. Holck (Medical Advisors), Captain William R. Evans, Captain Gary A. Pulliam and Captain Ronald E. Todd (Legal Advisors), Captain Joseph M. Neumann (Operations Advisor), First Lieutenant Michael R. Meyers and First Lieutenant Paul J. Richards (Maintenance Advisors), and Captain Paul E. Smith (Pilot/Technical Advisor) (TAB Y-1 thru Y-8).

2. Purpose: An aircraft accident investigation is convened under AFR 110-14 to collect and preserve all relevant evidence for possible use in claims, litigation, disciplinary actions, adverse administrative proceedings, or for any other purposes deemed appropriate by competent authority. The investigation is to obtain factual information, and it is not intended to determine the cause of the accident. In addition, the aircraft accident investigation board cannot make conclusions and recommendations. This report is available for public dissemination under the Freedom of Information Act (5 U.S.C. 552) and AFR 12-30.

SUMMARY OF FACTS

1. HISTORY OF FLIGHT: On 13 March 1989, a four-ship flight of F-16s, call signs Lynx 41 through Lynx 44, was scheduled to depart Nellis AFB, Nevada at 1605 PST to conduct a surface attack tactics (SAT) live drop mission on the Tactical Fighter Weapons Center (TFWC) Range Complex. Lynx 41 flight, as part of a multi-ship Red Flag composite force package, was assigned two targets to attack: Target 76-06, an SA-6 Regimental Headquarters; and Target 76-15, an SA-9 battery (TAB A-1). Both targets were located within the Range 76 section of the TFWC Range Complex and were certified for attack with live general purpose bombs (TAB O-2). The four pilots flying on the mission were: Captain David Gemperle, Lynx 41, flight lead; Captain Patrick Schertz, Lynx 42, wingman; Captain Lester O. Grady, (mishap pilot), Lynx 43, element lead; and Major Joseph P. Kahoe, Lynx 44, wingman. All four pilots were assigned to the 33 TFS, 363 TFW, Shaw AFB, South Carolina and were TDY to Nellis AFB to participate in Red Flag 89-3, (TAB A-1, V-1).

The four-ship flight (each carrying 6 MK-82 AIR general purpose bombs) departed Nellis AFB at 1617 PST, started the planned low

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level at 1631 PST, and at 1641 PST, the first element (Lynx 41 and 42) expended six bombs each on targets 76-15 and 76-06 respectively (TAB K-1, O-3, V-2, V-3). At 1645 PST, Lynx 43 released six (6) MK-82 AIRs from his aircraft. The bombs impacted and detonated 8 NM SSW of Millan, Nevada at coordinates 3735.8 N, 11641.0 W approximately 700 feet from manned threat site A-63 (TAB C-1). [SEE TAB R-1 for Site Diagram]. Two civilians, Diana Dray and Mickie Jeffers, employed by the Ford Aerospace Company as Smokey SAM operators were working outside at site A-63 at the time of this incident and were affected by the detonation of the MK-82 AIRs (TAB V-8, V-9). Two other civilian employees of Ford Aerospace, Lee Hubbard and Jorge Hernandez, were working inside the radar van at site A-63 at the time of the incident. Mr. Hernandez stated he was not injured (TAB V-10). Mr. Hubbard declined to be interviewed by the board and would not make a statement. Mr. Hubbard did not seek any medical attention that is known to this board. Both Mrs. Dray and Mrs. Jeffers were ground transported by Ford Aerospace employees to the NYE County Hospital, Tonopah, Nevada, where they were seen and released at approximately 2000 PST that same day, (TAB V-8, V-9, X-1, X-2). Lynx 44 did not drop any ordnance and recovered at Nellis AFB with his 6 MK-82 AIRs on board. Recovery of the four-ship at Nellis AFB was uneventful (TAB V-2, V-3, V-4, V-5). This incident received no local public news media attention. No press statements were issued by Nellis AFB Public Affairs (TAB V-12).

2. MISSION: Lynx 41 flight was conducting a day, four-ship, air-to-ground, live ordnance delivery mission on the TFWC Range Complex as part of the 33 TFS' employment operations during Red Flag 89-3. Lynx 43, the mishap pilot, was flying in the number 3 position as the element lead of the four-ship flight. The mission included single-ship takeoffs, flight joinup, strike force package rendezvous, low level ingress in a four-ship box formation, element attacks on separate targets, low level egress and flight recovery at Nellis AFB (TAB A-1, V-1, V-2). All flight members were current and qualified to perform the scheduled mission events and were medically cleared to fly (TAB T-1 thru T-10).

3. MISSION PREPARATION: All members of Lynx 41 flight had deployed to Nellis AFB on 25 February 1989 for a week of air-to-air training prior to flying in exercise Red Flag 89-3. Each of the flight members had received the requisite ground training to familiarize them with Red Flag operating procedures and had flown the mandatory range familiarization flight. All flight members stated that they had reviewed the Red Flag Special Instructions (SPINS) to include the section covering weapons employment and live drop restrictions (TAB V-1, V-2, V-3, V-4, V-5, V-6). Mission planning for Lynx 41's flight on Monday afternoon, 13 March 1989, began the preceding Friday, 10 March 1989. Captain Gemperle coordinated with the Package Commander to establish the overall

gameplan and briefed the flight members on their responsibilities. Final preparation and mission planning was to be completed beginning Monday morning (TAB V-2).

All members of Lynx 41 flight arrived at the Red Flag Operations building at 0900 PST on Monday, 13 March 1989. Each member stated he was adequately rested and prepared to fly the afternoon mission (TAB V-2, V-3, V-4, V-5). The flight conducted mission planning from 0900-1145. Lynx 42 mission planned the low level route. Lynx 43 mission planned the flight's target attacks from the pre IP to the IP and then to the target area. The target area photos at TAB S-1 thru S-4 were used by the flight for target area study (TAB O-4, V-2). From 1000-1030, Captain Gemperle attended briefings conducted by the Mission Director and afternoon Package Commanders. They reviewed how the strike packages were to be flown on target ingress, the live drop targets, timing and deconfliction, threat reactions, reattack if required, and target egress (TAB V-2). From 1030-1145, Lynx flight finalized mission plans. From 1145-1230 all members of Lynx 41 flight attended the Mass Briefing (TAB V-1, V-2). After the Mass Briefing, the flight broke for lunch and returned in time to start their individual flight briefing slightly more than two hours prior to their scheduled takeoff time of 1605 PST. Captain Gemperle conducted the flight briefing using the Briefing Guide in the 363 TFW Pilot Aid. The briefing concluded approximately 25 minutes prior to the flight's step time to the aircraft (1505 PST) (TAB V-2).

4. GROUND OPERATIONS: Pre flight and engine start procedures for Lynx 41 flight were normal (TAB V-2, V-3, V-4, V-5). After engine start and just prior to taxi, Lynx 43 noticed that his aircraft's Inertial Navigation System (INS) had not completed a normal alignment. Instead of completing an alignment to a "status 10", which would equate to a "full system" alignment, his INS showed a "status 40" after 9.1 minutes of alignment time. Additionally, his INS had automatically shifted to the NAV mode without NAV being selected on the INS panel (TAB V-5) [SEE TAB U-2 for synopsis of INS Alignment to Status 40 explanation]. He did not notify the flight lead, Lynx 41, at this time as the flight had already begun to taxi out for takeoff. He did not notify maintenance. Lynx 43 stated he considered the aircraft safe to fly (TAB V-5).

In accordance with Red Flag operating procedures for live ordnance missions, Lynx 41 flight was required to takeoff on Runway 03 to avoid overflight of populated areas. Nellis AFB was operating on Runway 21 at Lynx 41's takeoff time. Lynx 41 flight was therefore required to taxi and takeoff opposite to the existing taxi and takeoff flow. Lynx 41 flight arrived at the end of runway slightly late for their scheduled takeoff time of 1605 PST (TAB V-2). While Lynx 41 was awaiting his takeoff clearance between the runways, Lynx 43 called Lynx 41 on the radio and said that he had an INS

problem, that he could take the aircraft as it was, but he would like to get another alignment if possible (TAB V-5). Lynx 41 responded that there was not enough time to get another full alignment (TAB V-2). No further discussions were made and Lynx 41 flight departed Nellis AFB at 1617 PST (TAB K-1).

5. FLIGHT: After takeoff, Lynx 41 flight rejoined and proceeded uneventfully to the start of the low level.

NOTE: See attachments, A-1 thru A-3, this section, for maps depicting planned and actual low level routing, attack profiles flown by Lynx 41 and Lynx 43 elements, and detailed depiction of Lynx 43's live drop pass.

Lynx 41 flight began the low level portion of the mission at 1631 PST, 60 seconds behind the strike package (TAB V-2, O-3). On the low level, Lynx flight flew the briefed visual box formation: Lynx 41 and 42 (the first element) were 6-9,000 feet apart and line abreast; Lynx 43 and 44 were also 6-9,000 feet apart and line abreast as well as one and a half miles in trail with the lead element (TAB V-2, V-3, V-4, V-5). Lynx 43 flew visual formation off the first element as his primary means of navigation and used his map and INS as backups (TAB V-5). Approaching turn point two on the low level, Lynx 41 flight came under attack by adversary air, and the second element made a ninety degree defensive turn to the north. After completing this defensive reaction, Lynx 43 turned back on course, lost visual contact with Lynx 41 and 42 and became separated from the first element who were now 6 nautical miles (NM) in front of his position. After Lynx 41 and Lynx 43 elements became separated, Lynx 41 and 42 continued on to the target via the briefed low level, expended their ordnance on targets 76-15 and 76-06 respectfully, egressed the target area and recovered at Nellis AFB uneventfully (TAB O-3, V-2, V-3, V-5, and Atch 1 this section).

After separation, Lynx 43 and 44 also continued a low level ingress but tracked north of the planned course (Atch 1 this section). From turn point two to turn point three Lynx 43 initially navigated using his INS (TAB V-5). At eight miles prior to turn point three Lynx 43 asked his wingman, Lynx 44, for an ALPHA Check to point three. Lynx 44 responded with "Lynx 4, on the nose eight miles". Lynx 43 acknowledged this call with "Copy" (TAB N-1). Lynx 43 then determined that his INS was not taking him to turn point three, and he began navigating visually. He stated that, "I looked out in front of the airplane and I thought I saw Quartzite Peak [steerpoint four on the low level and the pre IP], and I flew to the point I thought was Quartzite Peak". He also stated that he did not recall referencing his low level map [TAB O-5] or his flight line up card [TAB O-6] for headings, times or distances after he started navigating visually (between points

two and three), from then on into the target area (TAB V-5). Lynx 43's element continued on a westerly heading, passed 4-5 NM north of point three, and entered the EC East section of the TFWC Range Complex. At 1639 PST, Lynx 43 element maneuvered SSW and then south through EC East. At 1640, Lynx 43 turned west, and asked Lynx 41 for his position from the IP. Lynx 41 responded, "IP now" (TAB N-2). Lynx 43 continued on a westerly heading and entered EC West. Lynx 43 then visually flew to and did an overfly update at 1641 on what he considered was the IP (TAB O-3, V-5). Lynx 43 then looked out to see where the Target Designator (TD) box was, identified the primary landmark that he had planned to fly the attack off, and began to fly to that point (TAB V-5). Using this landmark, Lynx 43 then flew a ground track in the vicinity of site A-63 that approximated the planned attack profile (TAB O-7) and Lynx 43's hand drawn IP to target sketch (TAB O-8). At 1641:30, Lynx 44 made a radio call stating, "Lynx 44 has steerpoint five [the IP] six miles off my left wing". Lynx 43 did not acknowledge this call. At 1641:43, Lynx 43 asked Lynx 41, "Did you drop"? No response was acknowledged. At 1641:48, he asked Lynx 42, "Did you drop"? Number 2 responded "Affirmative". At 1641:58, Lynx 43 told Lynx 44 that, "They were going to reattack" (TAB N-2).

During this first pass near site A-63, Lynx 43, although he had climbed up to a weapons release altitude, did not commit his aircraft to a nose low attitude or attempt to expend ordnance. Instead, he continued a mostly level left hand turn (TAB O-3). He stated he did this because he had not seen the first element's bombs and was unsure of whether or not he would be flying into the bomb frag pattern (TAB V-5). Lynx 43 also stated, "During the left hand climbing turn I saw what I considered to be the target area. I recognized it from the target photos I had seen in the briefings" (TAB V-5). During this dry pass over site A-63, Lynx 44 flew visual formation off Lynx 43 and stated that he thought number 3 was doing the briefed spacing maneuver behind the first element (TAB V-4). As their element then turned east after number 3's dry pass, Lynx 43 made a radio call and said, "O.K., lets turn around. We're going to hit the IP and do it again". Lynx 44 acknowledged this call and stated, "Roger, I've got 1 and 2's smoke at our right 5 O'clock". Number 3 responded with, "Copy" (TAB N-3). From 1642 to 1644, Lynx 43 element maneuvered east of site A-63. At 1644, Lynx 43 was slightly north and abeam Gold Mountain headed west with Lynx 44 approximately 2.5 NM in trail. From this point, Lynx 43 flew the ground track depicted at page A-3 this section, and at 1644:50 released six live general purpose bombs (TAB O-3, Z-6).

During the ordnance release phase, Lynx 44 was attempting to close the spacing on Lynx 43. As he was approximately 6000 feet from and still below Lynx 44, he saw Lynx 43 drop his bombs. He stated, "I rolled and pulled away, fairly surprised, then watched his bombs

hit in an open area with nothing there'. Lynx 44 also stated, 'During the maneuvering prior to bomb release I did not recognize or anticipate that we had over flown our IP and were, in fact, making an ordnance delivery on the target' (TAB V-4).

After Lynx 43 released his ordnance, Lynx 44 informed Lynx 43 that Lynx 44 had not dropped his ordnance and that he was Bingo fuel (TAB V-4). Lynx 43 then directed Lynx 44 to recover at Nellis with his bombs (TAB V-5). Lynx 43 element became separated on their easterly egress from the vicinity of site A-63. They both recovered single-ship at Nellis AFB uneventfully. Lynx 44 had his ordnance on board after landing (TAB V-4, V-5).

6. ORDNANCE IMPACT: The six (6) MK-82 AIR general purpose bombs impacted and detonated on the TFWC Range Complex approximately 700 feet NNE of site A-63. [See TAB R-1 thru R-2 for civil engineering diagram and close up photograph of site A-63. See TAB Z for aerial photographs of site A-63; TAB Z-1 thru Z-3 (looking westward); TAB Z-4 thru Z-6 (looking south); and TAB Z-7 (overhead)]. No damage to property or equipment located at the site occurred (TAB V-11).

7. AIRCRAFT DAMAGE: None.

8. EJECTION SEATS: Not applicable.

9. PERSONNEL AND SURVIVAL EQUIPMENT: Not applicable.

10. RESCUE: Not applicable.

11. CRASH RESPONSE: Not applicable.

12. MAINTENANCE DOCUMENTATION: A review of AFTO Form 781 series for aircraft 83-1157 revealed that the aircraft was properly configured, serviced, inspected, and released for flight by qualified maintenance personnel (TAB U-1). Debriefing records show the aircraft flew a 'Code 1' sortie (no discrepancies) on the first sortie of the day, the sortie prior to the mishap (TAB H-1). The aircraft had two pilot reported discrepancies following the second (mishap) sortie. The first discrepancy was 'INS stopped at Status 40. Had little drift on ground. Then landed with it 20 NM off. 30 knots ground speed' (TAB H-4). Post flight review of INS data address 125, flag code 000100, indicated movement during alignment which could cause the INS align status to stop at status 40 (TAB U-2). Subsequent INS alignment and drift checked good in accordance with the applicable technical order (TAB V-7). The second discrepancy was 'TACAN INOP on RTB'. This write-up was also checked by maintenance personnel who repaired the system IAW the applicable technical order (TAB H-4). A review of the historical records of the aircraft showed no history of inertial navigation system (INS) problems (TAB U-3). There were no overdue

inspections, time compliance technical orders, or time change items (TAB H-9 and H-10).

13. MAINTENANCE PERSONNEL AND SUPERVISION: Training records were reviewed and all personnel involved in the preflight, launch, weapons load, and avionics system repair were qualified and current (TAB U-1).

14. ENGINE, FUEL, HYDRAULIC AND OIL INSPECTION ANALYSIS: Not applicable.

15. AIRFRAME AND AIRCRAFT SYSTEMS: With the exception of the INS and TACAN, operation of all onboard equipment was unremarkable. Refer to paragraph 12, this section, for INS and TACAN remarks.

16. OPERATIONS PERSONNEL AND SUPERVISION: The mission was conducted under authority of the 363 TFW and 33 TFS, Shaw AFB, South Carolina. All supervisor briefings and actions were accomplished (TAB K-1, V-2). Major Talbert, Red Flag Duty Officer, conducted the Mass Briefing for the afternoon missions on 13 March 1989. All members of Lynx 41 flight were in attendance as well as the 33 TFS Commander, Lt Col Bonner (TAB V-1, V-2, V-6). Captain Gemperle, Lynx 41 flight lead, conducted the four-ship flight briefing using the 363 TFW Pilot Aid Briefing Guide. Only the four members of Lynx 41 flight attended this briefing (TAB V-2).

17. PILOT QUALIFICATIONS:

A. All members of Lynx 41 were current and fully qualified to perform the scheduled mission (TAB T-1 thru T-5).

B. Captain Grady's (mishap pilot) flying experience (TAB G-1) is summarized below:

(1) <u>AIRCRAFT/MISSION</u>	<u>HOURS</u>
F-16 Pilot	570
Student Pilot	184
F-111 WSO	400
Student Navigator	76

(2) <u>HOURS / SORTIES</u>	
10.8 / 10	Last 30 Days
31.6 / 22	Last 60 Days
39.7 / 26	Last 90 Days

(3) No training deficiencies were noted in Captain Grady's records. He completed two-ship flight lead upgrade 20 September 1988 (TAB T-8).

18. MEDICAL: Captain Grady was medically qualified for flight at the time of the incident (TAB T-9). No post incident Toxicology studies were ordered on Captain Grady.

Post accident medical records review of Mrs. Diana K. Dray and Mrs. Mickie V. Jeffers (civilian employees working at the incident site) revealed that both women were exposed to an explosion. Mrs. Dray was noted to have tinnitus (ringing in her ears), possible inhalation pneumonitis, soft tissue contusions and paravertebral muscle spasms (TAB X-1). Mrs. Jeffers was noted to have tinnitus, possible inhalation pneumonitis, soft tissue contusions, left shoulder scapular contusions and cervical myofascial strain (TAB X-2).

19. NAVIGATIONAL AIDS AND FACILITIES: Not applicable.

20. WEATHER: The weather forecast was 12,000 scattered, 25,000 scattered; visibility in excess of 40 miles; winds 330 degrees at 15, gust to 20 knots; sun angle 12 degrees; azimuth 256 degrees (TAB W-1). Existing weather at time of mishap was as forecast (TAB V-2, V-5).

21. DIRECTIVES AND PUBLICATIONS:

A. Applicable:

AFR 50-46, Nellis AFB Supplement 1, 30 NOV 88.
TAC Manual 51-50, 30 OCT 85.
TAC Regulation 55-79, 23 OCT 87.
TAC/PACAF/USAFE Regulation 55-116, 24 AUG 87.
TAC Special Interest Item (SII) 88-5, Radio Discipline.
RED FLAG Special Instructions, 1 JAN 89.
363 TFW, FCIF 88-19, 2 SEP 88.

B. Deviations:

(1) Lynx 43 and Lynx 44 overflowed manned sites in EC West with live ordnance on board and with their Master Arm switch in the "ARM" position. AFR 50-46, Nellis AFB Supplement 1, 30 NOV 88, para. 3-4 B; Red Flag Special Instructions, 1 JAN 88, page 3-3, para. 1 H (6)(b).

(2) Lynx 43 expended six MK-82 AIR general purpose bombs on an unauthorized target (site A-63) in the EC West portion of the TFWC Range Complex, an area in which live ordnance deliveries are specifically prohibited. AFR 50-46, Nellis AFB Supplement 1, 30 NOV 88, para. 3-4 A. Red Flag Special Instructions, 1 JAN 88, page 3-6, para 5 and WARNING.

(3) Lynx 43 did not place required navigational data (times, distances, headings) on his low level map. TAC/PACAF/USAFE

Regulation 55-116, 24 AUG 87, Chapter 2, Mission Planning; 363 TFW
FCIF 88-19, 2 SEP 88, Low-Level Planning/Flying.

(4) Lynx 41 flight used non standard radio transmissions during the low level and target attack phases of their mission (TAB N). TAC Special Interest Item (SII) 88-5, Radio Discipline.



PATRICK T. SAKOLE, Lt Colonel, USAF
AFR 110-14 Investigation Officer

1 Atch
Low Level and Target Area
Maps; Glossary

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NOTE 1. The actual routing flown by Lynx 41 and 42, from start low level (Student Gap) to targets 76-06 and 76-15, coincides with planned/briefed routing and is depicted by a solid, black line. Routes flown by Lynx 43 and 44 are shown in separate colors beginning at turn point two and continuing through dry pass on site A-63.

NOTE 2. Map depicts live drop pass of Lynx 43, Lynx 44's position, and relative position of Lynx 41 element.

NOTE 3. Detailed depiction of Lynx 43's live drop pass (reattack through bomb impact).