10-1971

On Target

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accident number 1

"When I rolled out on downwind I noticed Lead was almost crossing the target; Two and Three had good spacing. Two's downwind was slightly inside Three and Four and he was just starting his downwind to base turn. I looked back in the cockpit to set my bomb switches. When I looked up I saw Three and I couldn't pick up Two because he was lower than I expected. When I saw him he looked exactly vertical (nose low) about 800 – 1200 feet above the ground in a very slow roll to the left. I heard Three say, "Two what are you doing?" And I said over the radio, "Look out Two!" Lead went down and looked the wreckage over."

accident number 2

"We were watching two planes doing some type of maneuver. They were flying together and one of them had come out of a dive and left that area and headed towards the northwest in a steep climb. The other one veered to the southwest, I believe, and he climbed quite high, and we were watching both planes and it appeared he went into a power dive, like they were going to strafe. We were about a mile and a quarter to his right; he came down in his dive and apparently just about had his plane pulled out of it; it wasn't a vertical dive. He wasn't coming straight down; he was at a slight angle. And he almost pulled out. It looked like he ejected and then the plane crashed. There was a terrible explosion on impact. A ball of fire, a tremendous explosion."

Thus far in 1971 (as of 26 August 71) there have been 27 TAC/ANG aircraft accidents, six of which have been weapons delivery associated. Reduced to a percentage, it means 22 percent of all TAC/ANG accidents have occurred during weapons delivery maneuvers.

A comparison of 1969 and 1970 figures for the same time period indicates that a downward trend was in evidence prior to this year (17 percent for 1969 and 10 percent in 1970), however, a trend reversal has now occurred.

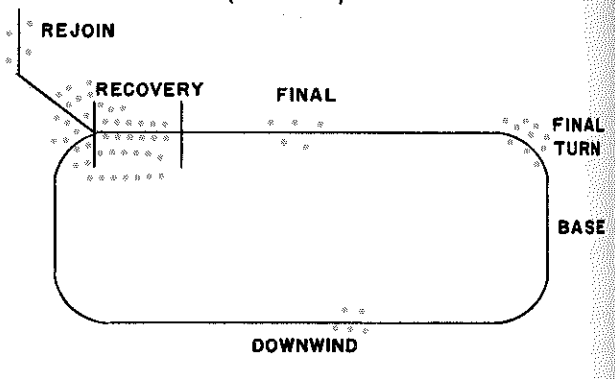
Prompted by the apparent trend reversal TAC Safety conducted a study of all TAC/ANG weapons delivery accidents that occurred during the period from January 1966 through August 1971. The study was conducted to determine where, in the range traffic pattern, the accidents had occurred and what maneuver was being executed.

In conducting the five and one-half year study the following areas were considered:

- On range accidents from all causes
- On range accidents from pilot, supervisory, and miscellaneous causes
- Off range simulated weapons delivery accident causes
- Uncontrolled range (no range officer) accidents from pilot, supervisory, and miscellaneous causes
- Accidents by event – strafe, skip, etc.
- Accidents by pattern location (pilot, supervisory, miscellaneous causes)
- Accidents by pattern location (all causes)
- Accidents by pilot experience

The following diagram indicates the pattern dispersion of the sixty-eight weapons delivery accidents which comprised the study.

ACCIDENTS BY PATTERN LOCATION
(all causes)

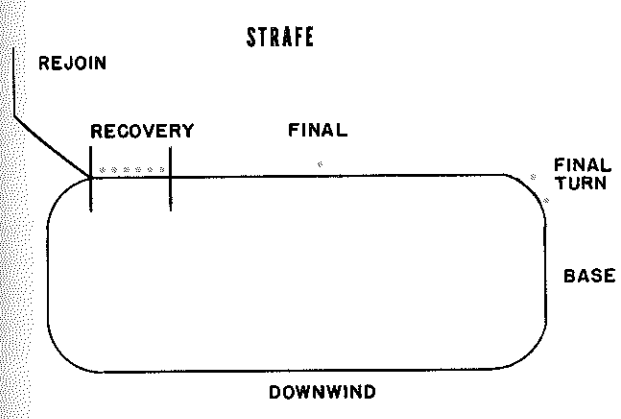


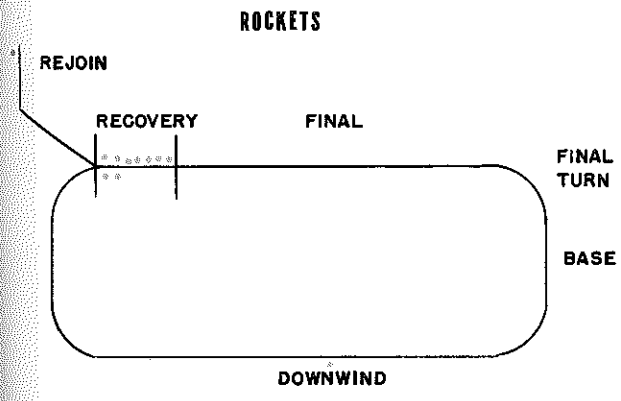
It can be easily surmised that the lion's share of the range accidents occur during the recovery, a time when both the pilot's skill and the airplane integrity are taxed to the greatest degree.

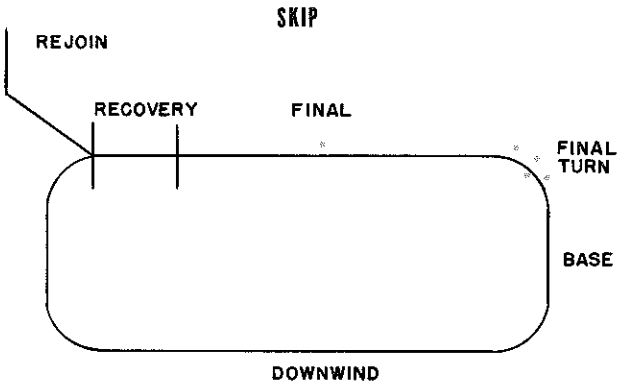
The diagrams below indicate the weapons delivery accidents by event (materiel causes omitted). Eighty-eight percent of the weapons delivery accidents occurred within the four depicted, conventional weapons delivery patterns. (Note: Depictions are not necessarily associated with controlled range deliveries.)

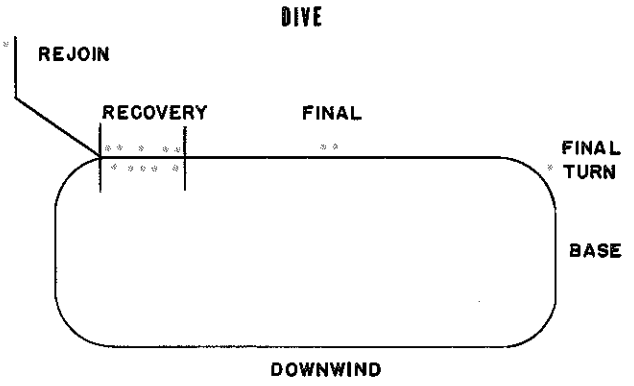
ACCIDENTS BY PATTERN LOCATION

(PILOT/SUPERVISORY/MISCELLANEOUS)









In the skip bomb pattern it is interesting to note that the majority of the accidents occurred during the base to final turn, a maneuver wherein the pilot is making a low altitude, descending turn, and attempting to line up on a specific run-in course. Overshoots due to wind direction or miscalculation followed by an attempt to correct can be disastrous in this low altitude regime.

A review of the thirteen dive bomb accidents revealed that 69 percent of them (9) occurred either off range or on an uncontrolled range. Pilots with minimum experience, either in the UE aircraft, total time, or both were involved in 77 percent (10) of the dive bomb accidents.

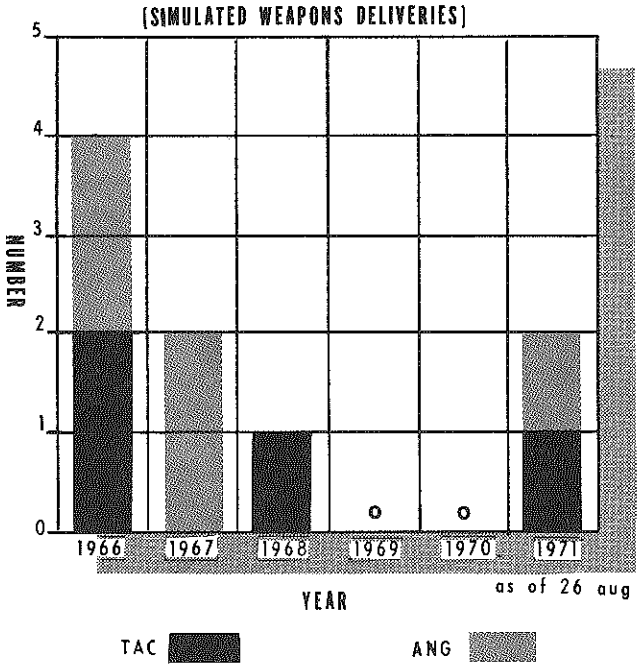
During the review of all weapons delivery accident causes several mishaps began to stand out as consuming a disproportionate chunk of the overall total. Consequently, the following charts were developed to point out the increase in weapons delivery accidents where no ground supervision was required.

The following chart indicates the number of off-range accidents that have occurred in TAC and ANG for the

ON TARGET

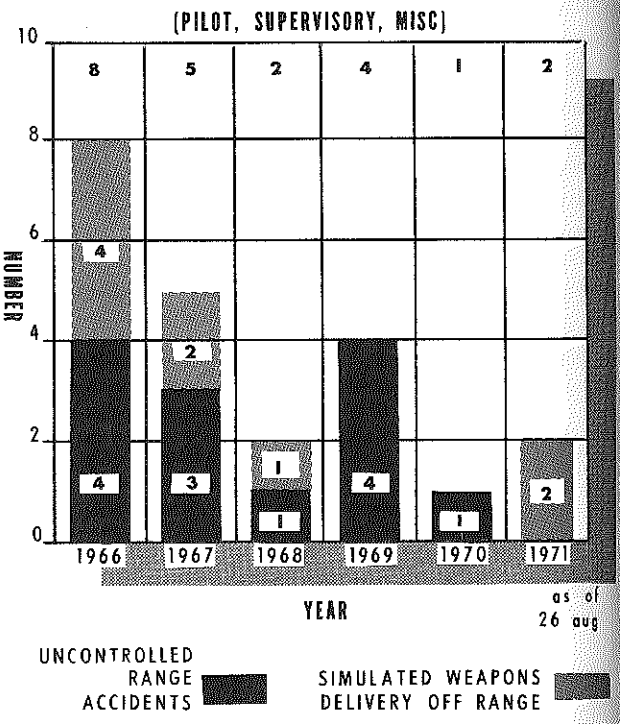
past five years. These accidents are all pilot factor or most probably pilot factor and were off-range simulated weapons delivery that occurred during road recce or missions in support of the Army on a military reservation. Of particular note is the fact that the ANG experienced five of the nine off-range accidents (56 percent) while experiencing eleven of the sixty-eight (16 percent) total delivery accidents reviewed. Pointedly, the off-range weapons delivery accident percentage for the ANG is abnormally high.

TAC/ANG
Off Range Accidents-9



The following chart reflects the total number of weapons delivery accidents where no ground supervision is required. It includes the total of off-range accidents plus those on-range accidents that occurred when there was no range officer present (tactical ranges). In all of these accidents, supervision of the flight is generated from within the flight and it is practically impossible for the supervisor to verify that proper dive angles, recovery altitudes, and other critical maneuvers are being accomplished correctly by all flight members.

NO GROUND SUPERVISION



The analysis revealed that over one-half of all non-materiel caused weapons delivery accidents occurred during off-range simulated delivery or uncontrolled range missions . . . no ground supervision.

When viewed from a training requirements standpoint it becomes quite obvious that something is not quite right. Continuation training sortie requirements for ground attack tactics or armed recce are less than ONE-THIRD of the requirements for controlled range sorties. ONE-THIRD OF THE TRAINING REQUIREMENTS IS PRODUCING OVER ONE-HALF OF THE ACCIDENTS.

conclusions

The base to final accidents in the skip bomb pattern indicate a need to re-evaluate the entire maneuver. AFP 55-89 permits a zero to twenty degree dive angle during low level bombing. While TAC units generally encourage dive angles of ten to twenty degrees, ANG units are continuing to employ level skip bombing practice. More definitive guidelines are in order.

The recovery accidents in the rocket delivery pattern are attributable, in large part, to the pilot's trance-like attention to the rocket trajectory resulting in a late recovery. These accidents can be prevented by constant re-education and supervision.

The thrust of this analysis is aimed at the weapons delivery accidents that occur when no ground supervision

is required. As shown, these events account for an alarming, out-of-proportion share of the weapons delivery accidents. There is little doubt that an experienced flight leader can plan, brief, and conduct a safe ground attack or armed recce mission under the existing guidelines. Take away the experience and it's a brand new ball game. A strengthened set of guidelines could enable the weaker or inexperienced leader to plan and execute a safe mission.

actions

To cope with the weapons delivery accident problems Headquarters TAC has taken the following actions.

1. Changes in the appropriate 55 series manuals have been written to provide the following minimum day recovery attitudes for ordnance deliveries (live or simulated) in Tactical Range/Close Air Support Training.

Dive angles of 30 degrees or more — 1000 feet AGL.

Dive angles of less than 30 degrees — 300 feet AGL, or one half of planned altitude loss for recovery, whichever is higher.

Level Deliveries — 200 feet AGL.

These changes have been published for F-4 and A-7 aircraft. Changes for remaining aircraft are in process of publication.

2. During off range ground attack tactics, close air support without a FAC, and armed reconnaissance training the minimum altitude has been established as 1000 feet AGL.

3. An evaluation is underway to determine the feasibility of raising the minimum delivery altitude for level skip bomb training from 50 feet to 100 feet and to restrict the final turn altitude on skip bomb deliveries to no lower than 300 feet AGL prior to rollout on final.

final thought

It is imperative that sound safety practices be blended with operational requirements to form a basis for mission effectiveness. Through constant re-evaluation of tactics and procedures we can achieve that necessary blend, and in doing so we keep the men and machinery on target in peacetime training to insure that in the crisis of war we can put those same men and that same machinery ON TARGET.