

CDF/Cal Fire S2 Fatal Airtanker Accidents, 1/1/73 - 12/1/12

Date: **FAA#** **T#** **CREW**

6/29/76 N414DF T-94 William W. Sears
Possible pilot incapacitation/heart attack. CFIT?

8/20/78 N448DF T-95 James M. Lippitt
Suspected stall on final approach for drop, LOCIF.

6/13/79 N404DF T-80 Gayle E. Eaton
Stall/spin during base-to-final turn (following leadplane) for drop, LOCIF.

7/27/82 N416DF T-96 James P. Eakin
"Aircraft struck tree on final approach to fire, losing some flight controls before crashing", CFIT.

7/13/84 N451DF T-92 Ted Bell Jr.
Enroute to fire, flew up a canyon he could not clear. Energy management, LOCIF.

9/28/84 N436DF T-100 Ed Real
Stalled turning into raising terrain after drop. Energy management, LOCIF.

6/29/86 N415DF T-77 (IP) Richard Boyd (P) Clarence R. Lind
Training flight; stalled after water drop. Suspect simulated engine failure practice being given. LOCIF.

10/7/87 N444DF T-79 Don Johnson
Stalled making a climbing turn after drop. LOCIF.

6/19/92 N427DF T-92 Roger Stark
After drop struck tree, severing about 11 ½' off left wing. CFIT.

10/5/98 N416DF T-96 Gary Nagel
Left wing tip impacted ground during tight turn to final on high wind, quartering tailwind drop; LOCIF.

8/27/01 (NTSB) N450DF/T-87 Larry Groff, N442DF/T-92 Lars Stratte
Midair collision over Bus incident.

The first two CDF S2A airtankers (T-70 and T-71) were operational in 1973. The first **CDF S2T** (Marsh's S2T T180 was on CDF contract 1987-1992) was operational in 1999.

The S2A fatal accident rate from 1973 through the 1998 fire season, prior to significantly upgraded initial and recurrent training concurrent with the introduction of the CDF S2T for the 1999 season, was 14.9 (10 accidents/67,234 hours); all were judged to be LOCIF (Loss Of Control In Flight) or CTIF (Controlled Flight Into Terrain). This judgment was based largely on circumstantial evidence, as no cockpit voice, video, or flight data recorders were on any of the aircraft. ***There have been no S2A or S2T LOCIF/CTIF accidents since T96 in 1998.***

S2A flight time 1973-2004 (last year for "A" model) was 80,149 hours, 12 fatal S2A accidents with 12 S2As destroyed, 13 S2A pilots lost. Overall CDF S2A fatal accident rate was 15 (per 100,000 hours). The 2001 mid-air is counted here as two accidents.

There have been no fatal S2T accidents. S2T airtanker flight hours, 1 Jan 1999-31 Dec 2007, was 27,547 hours.

Combined CDF/Cal Fire S2A/S2T flight time, 1 Jan 1973-31 Dec 2007 was 107,696 hours, fatal airtanker accident rate 11.1.

NTSB records do not include S2A airtanker (“public aircraft”) accidents prior to T96/1998, except for a midair between N405DF and a student pilot (a fatality) flying a PA-38 in the Ramona traffic pattern, 9/10/79. N405DF (Rusty Foster) received substantial damage, no injuries. *This S2A midair is not included in the above statistics.*

Seven of the twelve fatal S2A accidents (eight of the thirteen pilot fatalities), were attributed to LOCIF. Three others (Sears, Stark, Eakin) appear to be a subset, CFIT, but were possibly LOCIF. From discussions and debriefs, it appears that there have been numerous other occurrences of LOCIF that have resulted in satisfactory recoveries.

While current pilot selection, initial training, and annual recurrent training are vast improvements over what we did in 1973, serious consideration should be given to advanced upset/energy management/emergency maneuvering training, given the apparent causes of past S2 accidents. In addition, Aeronautical Decision Making (ADM), Operational Risk Management (ORM), Human Factors, Single-Pilot Resource Management (SPRM), and FOQA (Flight Operations Quality Assurance) are proven programs and disciplines that can help keep airtanker pilots out of situations that require extraordinary recovery skills. Flight Data Recorders, Cockpit Video Recorders, and Flight Reconstruction Systems can provide data to monitor day-to-day operations, which in turn can lead to enhanced safety and training programs, potential cost savings, plus give us invaluable tools for accident investigations instead of merely guessing at what happened. Technology such as AoA, DA and aircraft weight readouts in the cockpit, validated aircraft performance charts, EVS/SVS, NVG, and radar altimeters/AGPWS can give pilots and crews information to do their jobs safer and more effectively.

Cal Fire personnel may not be the appropriate ones to objectively audit their System Safety Management program; the use of third-party consultants should be considered. Such an on-going program may require soul-searching, agonizing decisions, and additional funding. But the current price of a replacement S2T is probably well over \$5 million. And what is the value of the property we protect? Or life of a crewmember?

The above statistics do not include non-fatal S2A or S2T airtanker incidents/accidents (mechanical problems, gear up landings, tree strikes, etc). No fatal S2A accidents have been attributed to engine or equipment malfunctions; however, our significantly upgraded S2T inspection and maintenance programs must be considered in any discussion of our improved airtanker accident rate.

In addition to the 2 midairs, there have been numerous near misses reported enroute to and over fires. “Cook Book” FTA (Fire Traffic Area) enroute/stacking procedures published in 2002 have helped tremendously, along with TCAD installation, which began in 2004.

There have been no IMC incidents/accidents in a CDF/Cal Fire S2A/T airtanker or OV10 Air Attack, and no fatal accidents attributed to mechanical malfunction or structural failure. We feel this is largely attributable to CDF/Cal Fire’s outstanding engineering/maintenance program, continual efforts to eliminate “mission mentality”, and management support for the right of pilots to “just say no”.

Walt Darran
1 Jan 2013