

(Applicant's exhibit 100 is entitled "Table of all accidents relevant to Skull Valley transit in which the pilot retained control and had enough time to avoid a specific site")

	Mishap Date	Mishap Facts	Ejection Altitude (AGL)	Shows ability to avoid ground site such as PFSF?*
1	26-Dec-89	After engine failed, pilot turned to avoid populated areas, but was unsuccessful in clearing his flight path by the time he reached minimum ejection altitude of 2000 feet AGL. "The pilot intentionally delayed ejection below minimums recommended in T.O. 1F-16C-1 to further avoid populated areas in his flight path." The pilot ejected at less than 1400 feet AGL, 20 seconds before impact, in violation of safety procedures. No identification of the "populated areas" pilot was attempting to avoid.	less than 1400 feet	No. Pilot was not able to avoid "populated areas" from minimum ejection altitude of 2000 ft. AGL, but intentionally went lower to avoid same
2	20-Sep-90	Engine failed, airstart attempted. Pilot performed "check turn" at undisclosed altitude, no- statement as to whether any ground sites were observed. Other formation member reported there were no "obstructions" off MA's nose. No indication that pilot steered away from a ground site.	not given	No.
3	15-Jan-91	On return flight from training range, F-16 developed fuselage fire which "grew in intensity until pilot ejected" over Everglades National Park. No indication that pilot steered away from a ground site.	not given	No.
4	20-Feb-91	Engine failed at 16,000 feet AGL and pilot tried unsuccessfully to glide to emergency airfield. Pilot ejected at 300 feet AGL in violation of safety procedures. No indication that pilot steered away from a ground site.	300 feet.	No.
5	7-May-91	Engine failed on takeoff and pilot ejected at 500 feet AGL. Pilot unsuccessfully "attempted to stretch the glide path out toward and over Lake Ogawara". F-16 impacted picnic grounds. No indication that pilot steered away from a ground site. (Did not maneuver to avoid radar site as stated in Applicant exhibit 100, but merely passed it.)	506 feet (w/16deg bank)	No.
6	13-Jan-92	Engine failed shortly after takeoff. Pilot "attempted to point the aircraft away from population centers" and ejected at less than 500 feet. The aircraft "hit a house in a sparsely populated area" destroying the house. No indication that the pilot tried to avoid impacting the house.	less than 500 feet	No. Aircraft hit and destroyed house. (PFS Ex. 100 states no damage reported)
7	31-Aug-92	Engine failed at 21,000 feet, 14 minutes prior to impact. After 3 restart attempts, pilot turned toward "what appeared to be an uninhabited area" and ejected. Aircraft impacted 150 yards from two inhabited dwellings. No indication that the pilot saw or attempted to avoid the two inhabited dwellings or other ground sites.	2000 feet	No.
8	17-Dec-92	F-16 ingested 2.5 pound bird causing engine failure and fire. Pilot pointed towards emergency airfield. After ejection, "the still-burning aircraft turned about 72 degrees further right, rolled beyond inverted, and impacted". The pilot was unable to control aircraft.	3000 feet	No. Aircraft not controllable.

NUCLEAR REGULATORY COMMISSION

Docket No. 72-22      Case File No. State 223  
In the matter of PFS  
Staff \_\_\_\_\_ IDENTIFIED   
Applicant \_\_\_\_\_ RECEIVED   
Intervenor  \_\_\_\_\_ REJECTED \_\_\_\_\_  
Cont'g of \_\_\_\_\_  
Contractor \_\_\_\_\_ DATE 7-2-02  
Other \_\_\_\_\_ Witness Horstman  
Reporter R. Davis

DOCKETED  
USNRC



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OFFICE OF THE SECRETARY  
RULEMAKINGS AND  
ADJUDICATIONS STAFF

9	21-Apr-93	Engine failed shortly after takeoff and pilot attempted to return to airfield. Pilot turned away from residential area and ejected prior to reaching runway.	50 feet	No. Represents only close range landing type maneuver.
10	11-Sep-93	Engine failed and aircraft was on fire. Pilot pointed toward emergency airfield. Pilot turned west away from populated area on advice of formation member and ejected. Aircraft impacted in sparsely populated area. No indication that pilot steered away from particular ground site.	above 10,000 feet	No.**
11	2-Feb-94	Engine failed and pilot attempted 6 airstarts. Pilot directed aircraft "toward a small ridge line" and ejected. No indication that pilot steered away from particular ground site. (This report is incorrectly dated 24-Feb-94 on PFS Ex. 100).	1800 feet	No.
12	21-Aug-95	Engine failed during training exercise. Pilot "cleared flight path" as to other formation members. Pilot then spent over 5 minutes on 3 attempted airstarts before ejecting. No indication that pilot saw or steered away from a ground site before ejecting.	4500 feet	No.
13	7-Jun-96	Engine failed and pilot turned toward emergency airfield, attempted 2 airstarts without success. Pilot delayed ejection below minimum ejection altitude to get below clouds. Pilot then cleared flight path away from inhabited farms.	1600 feet	No. Pilot could not see ground from 2000 ft., but cleared path when lower.
14	11-Jul-96	Engine failed at 21,000 feet MSL. Pilot turned towards emergency airfield. After 2 airstarts, engine failed again. Pilot turned "towards what he perceived to be a less congested area". Impact destroyed one home, severely damaged another, killed 4 year old and injured mother.	209 feet	No. <sup>1</sup> Destroyed 2 homes, killed child, injured mother.
15	15-May-95	Engine failed and pilot pointed F-16 "towards unpopulated terrain". After airstart attempt, the 2 pilots ejected. F-16 impacted private ranch land. No indication that pilot(s) saw or steered away from ranch.	2000 feet	No.**
16	24-Aug-98	After engine failed and restart attempted, pilot "turned out towards the ocean" ejecting "well below the minimum . . . to guarantee safe ejection".	1100 feet	No.
17	3-Apr-90	Engine caught fire, pilot reported usable thrust and turned toward emergency airfield to land. Shortly thereafter, pilot reported smoke in the cockpit and ejected. No indication pilot could see out of cockpit because of smoke, or that he attempted to steer away from a ground site. (Pilot did not turn towards bailout area as stated in PFS exhibit 100).	approx. 1000 feet	No.
18	7-Aug-90	Engine failed and pilots ejected. No indication that pilot saw or steered away from ground site.	1000 feet	No.
19	13-Jan-91	Engine, generator and hydraulics failed, smoke and fumes in cockpit. Pilot ejected while in uncontrolled spin. (No indication pilot turned towards base as stated in PFS exhibit 100).	23,000 feet	No. Aircraft not controllable.

<sup>1</sup> The mishap report notes that "From the area where the MP [mishap pilot] first saw Runway 17, my investigator could clearly see the runway, but couldn't see any built up areas at all . . . It wasn't until he was much closer to the field that he began to see the populated areas". (p. 13).

20	19-Mar-91	While returning to base, all electrical systems shut down. Jet began uncommanded barrel rolls, the pilot ejected while out of control.	9800 feet	No. Aircraft not controllable.
21	18-Apr-91	F-16 struck 4.5 pound bird causing engine failure and fire. Pilot turned towards emergency airfield. No indication the pilot checked for or steered away from ground sites before ejecting.	2800 feet	No.
22	17-Jul-91	Engine failed and pilot turned toward emergency airfield. Pilot ejected over Sea of Japan where F-16 impacted and crew landed. No indication the pilot checked for or steered away from ground sites.	2500 feet	No.
23	27-Nov-91	After engine failure and attempted airstart, pilot ejected. No indication the pilot checked for or steered away from ground sites.	900-1000 feet	No.
24	16-Dec-91	Engine failed, pilot pointed towards emergency airfield. Aircraft on fire when pilot ejected. No indication the pilot saw or steered away from ground sites.	11,000 feet	No.
25	24-Apr-92	Engine failed after takeoff. Pilot turned towards airfield but crashed short of runway on landing attempt. The pilot failed to eject and received burn injuries and fractured spine. No indication the pilot checked for or steered away from ground sites.	no ejection	No.
26	5-May-92	After engine failure, pilot turned towards airfield. Pilot was unable to stop aircraft when landing and ejected on runway.	0 feet	No.
27	1-Sep-92	Engine failed, pilot turned toward emergency airfield, attempted 3 airstarts and ejected. No indication the pilot saw or steered away from ground sites.	2000 feet	No.
28	18-Sep-92	Engine failed shortly after takeoff, pilot turned toward emergency airfield. Pilot pointed aircraft to a "low-populated area" and ejected.	600 feet	No.**
29	22-Oct-92	Engine failed and pilot turned towards emergency airfield. During attempted airstart, wingman advised pilot that he was too low and pilot ejected. No indication the pilot checked for or steered away from ground sites.	500 feet	No.
30	27-Aug-93	Engine failed at 31,000 ft., pilot turned towards emergency airfield where pilot landed but ejected on runway which was too short to stop aircraft. No indication the pilot saw or steered away from ground sites.	0 feet	No.
31	2-Feb-94	Engine failed, 6 airstarts attempted. Pilot "directed aircraft toward a small ridge and ejected". No indication the pilot saw or steered away from ground sites.	1800 feet	No.
32	7-Feb-94	Engine failed, pilot turned towards emergency airfield, attempted airstart and ejected. No indication the pilot saw or steered away from ground sites.	1500 feet	No.
33	30-Mar-94	Pilot, incorrectly suspected engine failure, turned towards emergency airfield and attempted to land. Pilot ejected during improper landing procedure. Report concludes cause of crash was "pilot error".	0 feet	No. Crash caused by pilot error.

34	20-Sep-94	Engine failed, pilot chose Hill AFB as emergency airfield, but couldn't reach it and ejected. Aircraft flew 7 more miles, impacting private property in Davis Co., Utah. No indication the pilot saw or steered away from ground sites. Pilot could have reached the nearer Wendover Airfield.	3300 feet	No.
35	25-Oct-94	Engine failed, pilot turned toward emergency airfield, attempted 3 airstarts, ejected. No indication the pilot saw or steered away from ground sites.	1380 feet	No.
36	5-Feb-95	Engine failed, pilot turned toward emergency airfield, attempted airstart and ejected. Aircraft impacted ranch land. No indication the pilot saw or steered away from ground sites.	3000 feet	No.
37	21-Dec-95	Engine failed, pilot turned toward emergency airfield, attempted several airstarts, ejected. No indication the pilot saw or steered away from ground sites.	1500-2000 feet	No.
38	19-Mar-96	Engine failed, pilot requested vector to emergency airfield, couldn't read instruments due to smoke in cockpit and ejected. No indication the pilot saw or steered away from ground sites.	2000 feet	No.
39	3-Aug-96	Engine failed, pilot turned toward emergency airfield and ejected. No indication the pilot saw or steered away from ground sites.	5400 feet	No.
40	21-Nov-96	Engine failed at 10,000 ft., 2 restarts attempted. Received directional heading to "unpopulated area". Pilot ejected above overcast at 2100 ft.	4000-5000 feet	No.** Pilot couldn't see ground.
41	29-Jan-97	Engine failed, pilot turned toward emergency airfield and ejected. No indication the pilot saw or steered away from ground sites.	800-840 feet	No.
42	4-Feb-97	Engine failed, pilot turned toward emergency airfield, 4 restarts attempted. Pilot and rear cockpit passenger ejected in clouds, couldn't see ground. No indication the pilot saw or steered away from ground sites.	6200 feet	No. Pilot couldn't see ground.
43	21-Apr-97	Engine failed, pilot turned toward emergency airfield and ejected. No indication the pilot saw or steered away from ground sites.	1500 feet	No.
44	8-Jan-98	Engine failed, pilot turned toward emergency airfield, attempted 2 airstarts and ejected. No indication pilot saw or steered away from ground sites.	1700 feet	No.
45	22-Jul-98	Engine failed, pilot turned toward emergency airfield, attempted 3 airstarts and ejected. No indication the pilot saw or steered away from ground sites.	3000 feet	No.
46	3-Sep-90	Aircraft on fire, pilot ejected, aircraft "pitched forward violently" and impacted at steep dive angle. No indication the pilot saw or steered away from ground sites.	not given	No. Aircraft not controllable.
47	23-Oct-90	Engine failed, pilot attempted restart and ejected. No indication the pilot saw or steered away from ground sites.	1500-2000 feet	No.
48	8-Jun-91	Engine failed, pilot attempted restart and ejected. No indication the pilot saw or steered away from ground sites.	900 feet	No.

49	31-May-92	Engine failed, one restart attempted. Pilot turned toward "uninhabited area" and ejected. No indication the pilot saw or steered away from ground sites.	AGL not given	No.**
50	13-Jul-95	After engine failed and 2 airstarts attempted, Supervisor of Flying advised pilot to "get out by 2000 ft AGL", which pilot misinterpreted as "get out by 10,000 ft AGL" and pilot ejected at 5700 ft AGL. Aircraft impacted property of local fire chief. No indication the pilot saw or steered away from ground sites.	5700 feet	No.
51	12-May-97	Engine failed, pilot attempted restart and ejected. Aircraft impacted private ranch land. No indication the pilot saw or steered away from ground sites.	497 feet	No.
52	22-Aug-97	Engine failed, pilot attempted 2 restarts and ejected. No indication the pilot saw or steered away from ground sites.	1200 feet	No.
53	19-Feb-93	Aircraft on fire, began uncontrolled climb into clouds and pilot ejected. No indication the pilot saw or steered away from ground sites.	not given	No. Aircraft out of control, pilot couldn't see ground.
54	23-Feb-93	Engine failed, pilot attempted restart and ejected. No indication the pilot saw or steered away from ground sites.	1800 feet	No.
55	11-Aug-93	Engine failed, pilot attempted 4 restarts and ejected over island. No indication the pilot saw or steered away from ground sites.	1700 feet	No.
56	9-Nov-93	Engine failed, pilot attempted 2 restarts and ejected, 12 seconds before impact. No indication the pilot saw or steered away from ground sites.	610 feet	No.
57	1-Jul-94	Engine failed after ingesting turkey vulture, pilot attempted restart and ejected. No indication the pilot saw or steered away from ground sites.	1500 feet	No.
58	13-Jan-95	Engine failed, pilot attempted restart and ejected above cloud cover. Aircraft impacted golf course. No indication the pilot saw or steered away from ground sites.	3000 feet	No. Pilot couldn't see ground due to clouds.
59	25-Jun-95	Engine failed, aircraft caught fire, pilot attempted restart and ejected. Impact on private property. No indication the pilot saw or steered away from ground sites.	2000 feet	No.

\* An F-16 pilot experiencing engine failure in Skull Valley will eject at a minimum altitude of 2000 feet above ground level (AGL), as directed by safety procedures contained in T.O. 1F-16C-1. At that altitude, the aircraft will be approximately 3.2 statute miles from the impact site. Any attempt to avoid impacting the PFSF site would have to be accomplished from 3.2 miles or further away, and from 2000 feet AGL or higher.

Reference to a pilot pointing an aircraft towards an emergency airfield shows the pilot's intent to attempt a landing, it is not a maneuver to avoid a ground site. To the contrary, a turn toward an emergency airfield may also be a turn towards a particular ground site located between the aircraft and the emergency airfield. For example, a pilot with engine failure in Skull Valley may turn towards Michael Army Airfield, and in doing so, may fly directly towards or closer to the PFSF.

\*\*A reference to a pilot pointing an aircraft away from a populated area or pointing towards a sparsely populated area, does not demonstrate the ability to avoid a specific site (such as the PFSF) located within a sparsely populated area.