

**Table A51-1. Attrition Data for Estimating Peacetime  
Aircraft Losses, USAF, USAFR, ANG  
(Based on Data as of 31 Dec 2003)**

<u>MDS</u>	<u>FLYING HOURS</u> <u>X</u>	<u>CONSTANT</u> <u>A</u>	<u>SLOPE</u> <u>B</u>
<b>Attack</b>			
A-10	3961213	0.3541619	0.369574
<b>Bomber</b>			
B-1	405665	0.0198208	0.453664
B-52	1516386	0.0251579	0.406249
<b>Cargo/Tanker</b>			
C-130	11172409	0.2087851	0.365391
C-135	594567	0.343214	0.205426
KC-135	2895269	0.0213008	0.380219
c-141	4305450	0.0000009	1.059239
c-5	2012785	0.2820576	0.204033
<b>Fighter/Interceptor/ Recon</b>			
F-117	164905	0.0003312	0.774506
F-15A-D	3874465	0.0086648	0.616626
F-15E	763240	0.0021835	0.603898
F-16A/B	2377475	0.0059125	0.675893
F-16C/D	4723620	0.0012449	0.768962
<b>Helicopter</b>			
H-1	685172	0.0004481	0.759988
H-60	252851	0.2199043	0.266196
<b>Trainer</b>			
T-37	11046550	0.3580182	0.356359
T-38	12102129	0.0066836	0.629419

**Acronyms:**

ANG	Air National Guard
CY	Calendar Year
HQ	Headquarters
MDS	Mission Design Series
PDS	Program Data System
POC	Point of Contact
USAF	United States Air Force
USAFR	United States Air Force Reserve

**References/Links:**

1. See table 52-1 for peace time aircraft attrition losses by 100K mile intervals for USAF, USAFR and ANG
2. See table 53-1 for peace time aircraft losses for selected aircraft not in table 51-1 for USAF, USAFR, and ANG

**Table Description:**

Attrition Data for Estimating Peace time aircraft losses for selected aircraft, USAF, USAFR, and ANG

**Business Rules & Assumptions:**

TABLE A51-1. ATTRITION DATA FOR ESTIMATING PEACETIME AIRCRAFT LOSSES(Active, USAFR and ANG. A method for estimating peacetime aircraft flying accident losses (attrition) by aircraft mission, design, and series (MDS).

a. The method of least squares regression analysis is used to compute the loss trends of an MDS or a group of MDSs. Basically, this method determines the relationship between cumulative hours (X) and cumulative losses (S) assuming that the curve is in the form  $S=AX^B$ . "A" and "B" are derived from actual flying hours and losses.

b. Given an aircraft MDS shown in the table, cumulative aircraft losses (S) may be estimated by using either of the the following equations:

(1)  $S = AX^B$

(2)  $\log S = \log A + B \log X$  where:

X = The cumulative number of flying hours (table A51-1) plus the programmed flying hours being considered in the following program period.

A = The intercept (table A51-1)

B = The slope of the regression curve (table A51-1)

The above expressions (the same mathematical relationship expressed in two ways) are based on worldwide USAF Active, USAFR, and ANG attrition experience.

c. As an example of the use to be made of table A51-1 data, we must show how cumulative number of losses associated with a hypothetical annual flying-hour program of 90,000 hours for the total A-10A force for a 6-year period (starting FY 98) would be determined.

6 years (FY98 - 03) programmed flying hours = 540,000

31 Dec 97 cumulative flying hours = 3,313,928

X = Total cumulative flying hours (as of 30 Sep 03) = 3,853,928

Equation (1),  $S = AX^B$  is then a straight-forward application that is difficult only because B usually is not an integer and, in most cases, less than one. If no calculator or computer is available to make this calculation, we recommend equation (2).

Equation (2),  $\log S = \log A + B \log X$ , requires use of log tables or a calculator with log and antilog capability.

d. Applying the A, B, and X values (.0009843, .759467, and 3,853,928) to either equation 1 or 2 would yield the number of cumulative losses up to 31 Dec 03 ( $S = 98.8$ ). Losses before 31 Dec 97 are computed, using the same A and B factor and an X factor of 3,313,928 (thus  $S = 88.1$ ). The number of losses during the 6-year (FY98 - FY03) period would be  $98.8 - 88.1 = 10.7$ .

e. There are many considerations entering into attrition estimates that are beyond the scope of tables A51-1 through A53-1 (such as estimating losses for aircraft in a hostile environment). Attrition estimates on which commitments are made for incorporation into an actual program may require more specialized and up-to-date information. For such information or more detailed estimating procedures, contact the OPR.

Note: Tables/Figures may be superceded.

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