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ACCIDENTS IN U. S. SCHEDULED AIR CARRIER PASSENGER OPERATIONS
(Calendar Years 1949 & 1948)

U. S. air carrier accidents in scheduled domestic and scheduled international passenger service during 1949 and 1948 are summarized in this report. Statistics are attached which show number of accidents, passenger and revenue plane miles flown, passengers carried, passenger fatalities per 100 million passenger miles, and crew fatalities. Tabulations are also attached showing in detail accident types and causes, personal injuries and aircraft damage.

COMPOSITE DOMESTIC AND U. S. FLAG INTERNATIONAL OPERATIONS (Table I)

Record Annual Passenger Total—Lowest Passenger Fatality Rate

The U. S. scheduled air carriers in passenger operation, domestic and international, in 1949 transported a record annual total of 16,640,082 revenue passengers 9,239,822,000 passenger miles with a passenger fatality rate of 1.0 per 100 million passenger miles. This compared with 14,540,951 revenue passengers carried 8,207,539,000 passenger miles at a 1.3 passenger fatality rate in 1948. The passenger fatality rate of 1.0 for combined operations in 1949 was the lowest ever achieved in any previous calendar year.

In the 1949 operations, there were 37 accidents, of which 4 were fatal resulting in 93 passenger, and 11 crew fatalities. In 1948 there were 63 accidents of which 6 were fatal causing 103 passenger and 25 crew fatalities. Revenue plane miles flown in 1949 aggregated 432,746,476 against 414,754,584 in 1948.

ALL DOMESTIC SCHEDULED OPERATIONS (Table I)

The Bureau of Economic Regulation[1/] separates the scheduled domestic air carriers into 3 specific groups, defined as follows:

1. "Trunk Lines: Those permanently certificated scheduled air carriers engaged in the transportation of mail, passengers and property over the major airline networks of the country."

1/ Also, the source of all traffic statistics used in this report.

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2. "Feeder Lines: Those temporarily certificated scheduled air carriers engaged in local services of a regional scope." Los Angeles Airways, Inc. and Helicopter Air Service although included in the "feeder group" are not considered in this report because of their specialized service involving the carrying of mail by helicopter.

3. "Territorial Lines: Consist of those permanently certificated scheduled air carriers conducting services wholly in territories or possessions of the United States."

Over 15 Million Passengers Carried in Domestic Operations

The trunk, feeder and territorial scheduled airlines in 1949 flew 15,120,015 revenue passengers 7,071,042,000 passenger miles at a passenger fatality rate of 1.3 per 100 million passenger miles. In 1948, a total of 13,168,095 revenue passengers were transported 6,245,745,000 passenger miles at an identical passenger fatality rate. In the four fatal accidents for 1949, there were 93 passenger and 11 crew fatalities against 83 passenger and 15 crew fatalities in 1948.

Revenue plane miles in this class of operation during 1949 totaled 333,707,756 against 320,834,753 in the preceding year. There were 4 fatal and 25 non-fatal accidents in 1949 in comparison with 5 fatal and 47 non-fatal accidents in 1948.

Record Number of Plane Miles per Fatal Accident

In 1949, both plane miles flown per fatal accident and per accident were higher than in any previous calendar year. Comparative figures in domestic passenger operations for the 1938 - 1949 period are shown below:

PLANE MILES FLOWN

	Per Fatal Accident	Per Accident
1938	13,679,665	3,109,015
1939	41,457,043	3,070,892
1940	36,623,681	3,788,657
1941	33,374,422	5,134,526
1942	21,944,063	4,770,449
1943	50,619,218	7,231,317
1944	42,645,848	5,330,731
1945	27,694,694	5,874,632
1946	33,256,332	9,655,064
1947	62,628,604	8,698,417
1948	64,166,950	6,169,899
1949	83,426,939	11,918,134

TRUNK LINE CARRIERS (Table Nos. I & II)

The 16 trunk carriers during 1949 flew 14,021,047 revenue passengers 6,169,350,000 passenger miles at a passenger fatality rate of 1.4 in comparison with 12,324,038 revenue passengers flown 6,095,365,000 passenger miles at an identical fatality rate in 1948. Revenue plane miles flown in 1949 totaled 301,072,766 (301,194,517 in 1948). The 4 fatal and 22 non-fatal accidents in 1949 compared with 5 fatal and 39 non-fatal accidents in 1948. Ninety three passengers and 11 crew members were fatally injured against 83 and 15, respectively, in 1948.

FEEDER AIRLINES (Table Nos. I & VII)

These carriers flew 677,817 revenue passengers 147,999,000 passenger miles without a single passenger or crew fatality in 1949. The respective figures in 1948 were 425,685 passengers and 96,965,000 passenger miles likewise without a single passenger or crew fatality. There were no fatalities in feeder operation during 1946 and 1947.

TERRITORIAL CARRIERS (Table Nos. I & VIII)

The territorial carriers transported 421,151 revenue passengers 53,693,000 passenger miles without fatality and accident free in 1949. In 1948 a total of 411,372 revenue passengers were carried 53,415,000 passenger miles also without fatality.

TYPES, CAUSES, OPERATIONAL PHASES, INJURY AND DAMAGE IN DOMESTIC AIR CARRIER ACCIDENTS (Table Nos. III, IV, V and VI)
(Trunk, Feeder, & Territorial)

Type of Accident vs Operational Phase (Table III)

In 1949 there were 6 accidents involving collision with objects other than aircraft (8 in 1948). Two occurred during landing roll, 1 each in taxying to take off, taxying from landing, and take off run, and 1 in normal flight. There were 3 mid-air collisions between aircraft, 3 stalls, and 3 instances of overshooting. Undershooting and fire in air accounted for 2 accidents each. Ground-loop, wheels up, hard landing, nose up-over, collision two aircraft (both on ground) and airframe failure resulted in 1 accident each. Four other accidents involved the following: Prop. failure 2, hailstorm 1, and severe pitching in air 1.

Type of Accident vs Injury (Table IV)

Of the 4 fatal accidents in domestic scheduled operation, 2 involved mid-air collision between aircraft, and 2 stalls. There were 3 serious injury accidents which resulted from overshooting, severe pitching in air, and stall.

Operational Phase vs Injury (Table V)

Of the 4 fatal accidents in 1949, one occurred during normal flight, 2 in landing approach, and 1 in a go-around. Three of the 5 fatal accidents in 1948 occurred in normal flight, and 1 each in take off climb and landing approach The 3 serious injury accidents in 1949 were during take off climb, normal flight and landing roll. The 2 serious injury accidents in 1948 happened in normal flight.

Included with the 22 minor and no injury accidents were 8 during the landing roll, 5 in normal flight, and 2 each in take off run and landing approach. The remaining 5 accidents fell under diversified phase headings.

During 1949, six aircraft were destroyed, 21 received substantial damage and 2 received minor or no damage. Seven aircraft were destroyed, 43 substantially damaged and 2 received minor or no damage in 1948.

Primary Cause vs Operational Phase (Table VI)

Pilot error was the primary cause of 9 (31%) of the 29 accidents for domestic scheduled operations in 1949. This factor accounted for 18 (34.6%) of the 52 accidents in 1948. Other personnel error was the primary cause of 4 accidents in 1949 (1 in 1948), powerplant 4 (8), airframe 1 (2), landing gear 2 (8), equipment and accessories 1 (1), weather 2 (8), airport terrain 3 (3), miscellaneous 1 (2), and undetermined 0 (1). Two accidents are still in process with respect to determination of probable cause.

The detailed factors of these primary causes are set forth in Table VI in relation to the operational phase of the aircraft at time of accident.

U. S. FLAG INTERNATIONAL SCHEDULED CARRIERS

Record Level of Operations Without Fatality

The international scheduled carriers (see Tables I & IX) transported 1,520,067 revenue passengers 2,168,780,000 passenger miles without a single passenger or crew fatality in 1949. This compares with 1,372,856 revenue passengers and 1,961,794,000 passenger miles in 1948 at a 1.0 passenger fatality rate per 100 million passenger miles. In that year there was one fatal accident which caused 20 passenger and 10 crew fatalities.

Type of Accident (Tables X & XI)

In the 8 accidents for international operations in 1949, the type of accident included undershooting 1, collision between aircraft (both airborne) 1, collision with other objects 4, fire in air 1 and turbulence 1.

Primary Cause (Table XII)

Pilot error was the primary cause of 6 (75%) of the 8 accidents in 1949 and of 3 (27.3%) of the 11 accidents in 1948. Powerplant and weather accounted for 1 accident each.

Operational Phase vs Injury and Damage (Table XIII)

Of the 8 accidents in 1949, 1 resulted in serious injury and 7 in minor or no injury. Three occurred in normal flight, 3 in landing approach and 1 each in taxying from landing and taxying in returning to ramp. None of the air carrier aircraft involved in the 8 accidents incurred greater than substantial damage.

In 1948, the single fatal accident occurred during the landing approach.

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COMPARATIVE SAFETY RECORD OF ALL CLASSES OF U. S. AIR CARRIERS
IN SCHEDULED PASSENGER OPERATIONS
(Calendar Years 1949 & 1948 by Quarters)

TABLE I

Classes of Operation	Accidents Total	Accidents Fatal	Passengers Carried 1/	Passengers Fatal 2/	Passenger 2/ Miles (000)	Passenger Fatalities per 100 Million Passenger Miles	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue 3/ Plane Miles
DOMESTIC										
Trunk Lines										
1st Quarter 1949	6	-	2,780,362	-	1,424,758	-	-	-	-	69,180,846
2nd Quarter 1949	5	-	3,927,007	-	1,894,910	-	-	-	-	78,891,990
3rd Quarter 1949	9	1	4,006,951	12	1,932,236	.6	1	1	1	82,498,076
4th Quarter 1949	6	3	3,306,727	81	1,617,446	5.0	2	2	4	75,501,854
Total.....	26	4	14,021,047	93	6,869,350	1.4	3	3	5	306,072,766
1st Quarter 1948	11	3	2,326,912	11	1,223,432	.9	2	2	3	66,613,814
2nd Quarter 1948	8	1	3,331,887	39	1,647,557	2.4	1	1	2	77,054,574
3rd Quarter 1948	11	1	3,562,031	33	1,718,213	1.9	1	1	2	82,713,433
4th Quarter 1948	14	-	3,103,208	-	1,506,163	-	-	-	-	74,812,696
Total.....	44	5	12,324,038	83	6,095,365	1.4	4	4	7	301,194,517
Feeder Lines										
1st Quarter 1949	1		103,929		24,080					4,631,388
2nd Quarter 1949	2		176,448		38,715					5,670,746
3rd Quarter 1949	-		225,018		47,248					6,581,385
4th Quarter 1949	-		172,422		37,956					7,040,812
Total.....	3		677,817		147,999					23,924,331
1st Quarter 1948	1		56,051		12,914					2,846,547
2nd Quarter 1948	2		106,057		23,877					3,943,043
3rd Quarter 1948	2		142,860		32,350					4,784,069
4th Quarter 1948	2		120,717		27,824					4,705,543
Total.....	7		425,685		96,965					16,279,202

TABLE I (Continued)

Classes of Operation	Accidents Total	Accidents Fatal	Passengers Carried1/	Passengers Fatal2/	Passenger 2/ Miles (000)	Passenger Fatalities Per 100 Million Passenger Miles	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue3/ Plane Miles
Territorial Lines										
1st Quarter 1949			95,637		11,829					769,758
2nd Quarter 1949			105,713		13,304					859,876
3rd Quarter 1949			128,326		16,931					1,149,682
4th Quarter 1949			91,475		11,629					931,343
Total.....			421,151		53,693					3,710,659
1st Quarter 1948	-		97,344		12,181					759,117
2nd Quarter 1948	-		101,733		13,092					828,225
3rd Quarter 1948	-		124,873		16,424					1,032,750
4th Quarter 1948	1		94,422		11,718					740,942
Total.....	1		418,372		53,415					3,361,034
Sub-Total Domestic										
1st Quarter 1949	7	-	2,979,928	-	1,460,667	-	-	-	-	74,5811992
2nd Quarter 1949	7	-	4,209,168	-	1,946,929	-	-	-	-	85,422,612
3rd Quarter 1949	9	1	4,360,295	12	1,996,415	.6	1	1	1	90,229,143
4th Quarter 1949	6	3	3,570,624	81	1,667,031	4.9	2	2	4	83,474,009
Total.....	29	4	15,120,015	93	7,071,042	1.3	3	3	5	333,707,756
1st Quarter 1948	12	3	2,480,307	11	1,248,527	.9	2	2	3	70,219,478
2nd Quarter 1948	10	1	3,539,677	39	1,684,526	2.3	1	1	2	81,825,842
3rd Quarter 1948	13	1	3,829,764	33	1,766,987	1.9	1	1	2	88,530,252
4th Quarter 1948	17	-	3,318,347	-	1,545,705	-	-	-	-	80,259,181
Total.....	52	5	13,168,095	83	6,245,745	1.3	4	4	7	320,834,753
INTERNATIONAL										
1st Quarter 1949	3		361,526		465,247					23,152,557
2nd Quarter 1949	1		385,516		575,793					24,955,544
3rd Quarter 1949	1		431,524		640,400					27,035,945
4th Quarter 1949	3		341,501		487,340					23,894,674
Total.....	8		1,520,067		2,168,780					99,038,720
1st Quarter 1948	3	-	317,639	-	397,272	-	-	-	-	21,041,759
2nd Quarter 1948	5	1	330,353	20	495,160	4.0	1	1	8	22,906,760
3rd Quarter 1948	1	-	393,891	-	573,210	-	-	-	-	25,722,105
4th Quarter 1948	2	-	330,973	-	496,152	-	-	-	-	24,249,207
Total.....	11	1	1,372,856	20	1,961,794	1.0	1	1	8	93,919,831

TABLE I (Continued)

Classes of Operation	Accidents		Passengers		Passenger Miles (000) 2/	Passenger Fatalities Per 100 Million Passenger Miles	Crew Fatalities			Revenue Plane Miles 3/
	Total	Fatal	Carried 1/	Fatal 2/			Pilot	Copilot	Other	
Grand Total All Carriers										
1st Quarter 1949	10	-	3,341,454	-	1,925,914	-	-	-	-	97,734,549
2nd Quarter 1949	8	-	4,594,684	-	2,525,722	-	-	-	-	110,378,156
3rd Quarter 1949	10	1	4,791,819	12	2,636,815	.5	1	1	1	117,265,088
4th Quarter 1949	9	3	3,912,125	81	2,154,371	3.8	2	2	4	107,368,683
Total.....	37	4	16,640,082	93	9,241,160	1.0	3	3	5	432,746,476
1st Quarter 1948	15	3	2,797,946	11	1,645,799	.7	2	2	3	91,261,237
2nd Quarter 1948	15	2	3,870,030	59	2,179,686	2.7	2	2	10	104,732,602
3rd Quarter 1948	14	1	4,223,655	33	2,340,197	1.4	1	1	2	114,252,357
4th Quarter 1948	19	-	3,649,320	-	2,041,857	-	-	-	-	104,508,388
Total.....	63	6	14,540,951	103	8,207,539	1.3	5	5	15	414,754,584

1/ Revenue passengers only.
2/ Both revenue and non-revenue.
3/ In scheduled passenger operations.

NOTE: Excludes propeller accidents to persons.

Statistics for 1949 contained in this and subsequent tables are subject to slight revision.

COMPARATIVE SAFETY RECORD OF INDIVIDUAL DOMESTIC TRUNK LINE AIR CARRIERS IN DOMESTIC SCHEDULED PASSENGER OPERATIONS
(Calendar Years 1949 & 1948 by Quarters)

TABLE II

Operators	Accidents Total	Accidents Fatal	Passengers Carried[1]	Passengers Fatal[2]	Passenger[2] Miles (000)	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue[3] Plane Miles
American Airlines									
1st Quarter 1949	1	-	623,366	-	330,570	-	-	-	11,361,748
2nd Quarter 1949	2	-	921,675	-	441,141	-	-	-	13,154,155
3rd Quarter 1949	1	-	902,361	-	440,073	-	-	-	13,832,733
4th Quarter 1949	3	1	766,995	26	379,724	-	-	2	13,097,037
Total.....	7	1	3,214,897	26	1,591,508	-	-	2	51,445,673
1st Quarter 1948	-		462,528		237,993				10,415,885
2nd Quarter 1948	5		748,031		365,285				13,125,019
3rd Quarter 1948	2		835,642		399,212				15,057,927
4th Quarter 1948	4		734,799		372,655				12,595,148
Total.....	11		2,781,000		1,375,145				51,193,979
Braniff Airways									
1st Quarter 1949			122,585		43,356				2,564,269
2nd Quarter 1949			161,197		56,332				2,781,215
3rd Quarter 1949			160,990		56,910				2,923,314
4th Quarter 1949			146,704		51,216				2,718,140
Total.....			591,476		207,814				10,986,938
1st Quarter 1948			112,404		41,518				2,470,015
2nd Quarter 1948			152,819		54,638				2,685,699
3rd Quarter 1948			151,943		55,199				2,797,570
4th Quarter 1948			148,500		52,506				2,797,867
Total.....			565,666		203,861				10,751,151

TABLE II (Continued)

Operators	Accidents Total	Accidents Fatal	Passengers Carried[1]	Passengers Fatal[2]	Passenger[2] Miles (000)	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue[3] Plane Miles
Capital Airlines (P.C.A.)									
1st Quarter 1949	-	-	202,789	-	61,050	-	-	-	4,143,121
2nd Quarter 1949	-	-	345,703	-	106,104	-	-	-	5,038,898
3rd Quarter 1949	2	-	357,915	-	108,561	-	-	-	5,269,468
4th Quarter 1949	1	1	284,593	4	88,147	1	1	-	4,869,963
Total.....	3	1	1,191,000	4	363,862	1	1	-	19,321,450
1st Quarter 1948	-		186,602		49,989				3,305,184
2nd Quarter 1948	-		287,524		80,989				4,467,672
3rd Quarter 1948	-		297,017		81,896				4,606,156
4th Quarter 1948	2		250,756		74,068				4,296,156
Total.....	2		1,021,899		286,942				16,675,168
Chicago & Southern Air Lines									
1st Quarter 1949			62,224		23,474				1,698,663
2nd Quarter 1949			84,665		31,849				1,940,665
3rd Quarter 1949			89,894		30,415				2,017,953
4th Quarter 1949			76,171		26,998				1,826,441
Total.....			312,954		112,736				7,483,722
1st Quarter 1948			52,969		22,380				1,511,807
2nd Quarter 1948			75,675		30,711				1,767,114
3rd Quarter 1948			79,265		29,737				1,922,237
4th Quarter 1948			73,529		27,344				1,873,494
Total.....			281,438		110,172				7,074,652
Colonial Airlines									
1st Quarter 1949			33,256		9,101				781,738
2nd Quarter 1949			51,175		13,800				1,017,339
3rd Quarter 1949			66,472		16,918				1,281,935
4th Quarter 1949			41,337		11,002				953,051
Total.....			192,240		50,821				4,034,063
1st Quarter 1948	-		23,604		6,799				552,867
2nd Quarter 1948	-		35,523		10,056				728,752
3rd Quarter 1948	1		47,786		13,090				947,345
4th Quarter 1948	-		35,650		9,761				847,042
Total.....	1		142,563		39,706				3,076,006

TABLE II (Continued)

Operators	Accidents Total	Accidents Fatal	Passengers Carried[1]	Passengers Fatal[2]	Passenger-Revenue Miles (000)	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue Plane Miles
Continental Air Lines									
1st Quarter 1949	1		34,872		13,545				1,350,531
2nd Quarter 1949	-		49,371		19,136				1,475,396
3rd Quarter 1949	1		52,250		20,894				1,486,910
4th Quarter 1949	-		43,202		16,795				1,370,443
Total.....	2		179,695		70,370				5,683,280
1st Quarter 1948	-		30,724		11,936				1,203,814
2nd Quarter 1948	1		43,335		16,869				1,409,619
3rd Quarter 1948	2		48,148		18,792				1,583,159
4th Quarter 1948	-		39,181		14,881				1,393,643
Total.....	3		161,388		62,478				5,590,235
Delta Air Lines									
1st Quarter 1949	-		122,238		57,204				2,894,005
2nd Quarter 1949	1		142,922		57,180				3,004,538
3rd Quarter 1949	-		133,961		52,099				3,039,401
4th Quarter 1949	-		126,718		51,404				2,981,867
Total.....	1		525,839		217,887				11,919,811
1st Quarter 1948	2	1	99,010	8	45,276	1	1	2	3,014,687
2nd Quarter 1948	-	-	133,273	-	49,935	-	-	-	3,053,418
3rd Quarter 1948	-	-	129,720	-	47,758	-	-	-	2,999,831
4th Quarter 1948	2	-	123,601	-	48,761	-	-	-	2,978,327
Total.....	4	1	485,604	8	191,730	1	1	2	12,046,263
Eastern Air Lines									
1st Quarter 1949	1	-	514,544	-	274,097	-	-	-	12,452,223
2nd Quarter 1949	1	-	608,745	-	274,181	-	-	-	12,693,696
3rd Quarter 1949	2	1	560,039	12	244,973	1	1	1	12,371,416
4th Quarter 1949	1	1	524,194	51	243,862	1	1	2	12,466,056
Total.....	5	2	2,207,522	63	1,037,113	2	2	3	49,983,391
1st Quarter 1948	5	2	466,083	3	283,309	1	1	1	12,114,122
2nd Quarter 1948	-	-	541,928	-	265,792	-	-	-	12,032,051
3rd Quarter 1948	-	-	498,776	-	230,622	-	-	-	11,609,772
4th Quarter 1948	2	-	491,998	-	228,298	-	-	-	11,654,318
Total.....	7	2	1,998,785	3	1,008,021	1	1	1	47,410,263

TABLE II (Continued)

Operators	Accidents Total	Accidents Fatal	Passengers Carried[1]	Passengers Fatal[2]	Passenger[2] Miles (000)	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue[3] Plane Miles
Inland Air Lines									
1st Quarter 1949			17,477		6,052				551,667
2nd Quarter 1949			21,334		8,424				694,463
3rd Quarter 1949			25,837		10,402				805,659
4th Quarter 1949			20,222		7,745				695,847
Total.....			84,870		32,623				2,747,636
1st Quarter 1948			15,366		5,771				567,712
2nd Quarter 1948			18,782		7,077				576,631
3rd Quarter 1948			21,533		8,195				586,117
4th Quarter 1948			17,999		6,616				577,854
Total.....			73,680		27,659				2,308,314
Mid-Continent Airlines									
1st Quarter 1949	1		69,463		21,907				1,853,534
2nd Quarter 1949	-		92,867		28,753				2,196,554
3rd Quarter 1949	1		92,668		28,488				2,300,364
4th Quarter 1949	-		82,519		25,007				2,128,511
Total.....	2		337,517		104,155				8,478,963
1st Quarter 1948			60,910		19,244				1,651,803
2nd Quarter 1948			87,561		27,329				2,110,237
3rd Quarter 1948			86,711		26,995				2,175,118
4th Quarter 1948			77,919		24,267				2,032,585
Total.....			313,101		97,835				7,969,743
National Airlines									
1st Quarter 1949			80,184		51,713				2,274,427
2nd Quarter 1949			73,114		44,071				2,518,001
3rd Quarter 1949			71,239		42,446				2,597,284
4th Quarter 1949			72,976		45,234				2,674,401
Total.....			297,513		183,464				10,064,113
1st Quarter 1948	-		30,028		16,924				901,307
2nd Quarter 1948	-		36,353		22,720				1,264,643
3rd Quarter 1948	1		44,898		25,928				1,662,570
4th Quarter 1948	-		54,373		32,477				1,815,218
Total.....	1		165,652		98,049				5,643,738

TABLE II (Continued)

Operators	Accidents Total	Accidents Fatal	Passengers Carried[1]	Passengers Fatal[2]	Passenger Miles (000)[2]	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue Plane Miles[3]
Northeast Airlines									
1st Quarter 1949	-		54,246		10,978				794,858
2nd Quarter 1949	-		87,449		17,480				995,137
3rd Quarter 1949	1		115,744		23,235				1,236,922
4th Quarter 1949	-		67,524		13,723				986,655
Total.....	1		324,963		65,416				4,013,572
1st Quarter 1948	-		47,876		9,476				690,276
2nd Quarter 1948	-		68,698		13,809				827,888
3rd Quarter 1948	-		96,478		19,528				1,059,996
4th Quarter 1948	1		59,240		11,911				787,500
Total.....	1		272,292		54,724				3,365,660
Northwest Airlines									
1st Quarter 1949	-		118,094		62,512				3,661,760
2nd Quarter 1949	-		202,733		119,511				4,711,785
3rd Quarter 1949	1		227,447		141,224				5,261,307
4th Quarter 1949	-		180,637		114,586				5,059,882
Total.....	1		728,911		437,833				18,694,734
1st Quarter 1948	-	-	110,422	-	59,747	-	-	-	3,420,792
2nd Quarter 1948	-	-	178,182	-	99,381	-	-	-	4,400,777
3rd Quarter 1948	4	1	192,138	33	107,078	1	1	2	4,821,846
4th Quarter 1948	1	-	133,448	-	72,528	-	-	-	3,983,223
Total.....	5	1	614,190	33	338,734	1	1	2	16,626,638
Transcontinental & Western Air									
1st Quarter 1949	1		261,435		192,923				11,155,321
2nd Quarter 1949	-		403,671		287,545				12,524,283
3rd Quarter 1949	-		401,660		291,458				12,692,935
4th Quarter 1949	1		319,841		225,035				10,315,208
Total.....	2		1,386,607		996,961				46,687,747
1st Quarter 1948	3		234,769		195,016				11,721,619
2nd Quarter 1948	1		330,608		244,005				13,054,956
3rd Quarter 1948	-		356,149		257,375				14,210,659
4th Quarter 1948	2		315,375		218,307				13,165,022
Total.....	6		1,236,901		914,703				52,152,256

TABLE II (Continued)

Operators	Accidents Total	Accidents Fatal	Passengers Carried 1/	Passengers Fatal 2/	Passenger 2/ Miles (000)	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue 3/ Plane Miles
United Air Lines									
1st Quarter 1949	1		404,189		242,726				10,197,927
2nd Quarter 1949	1		607,483		360,907				12,660,759
3rd Quarter 1949	-		672,832		393,104				13,666,001
4th Quarter 1949	-		488,560		289,914				11,665,333
Total.....	2		2,173,064		1,286,651				48,190,020
1st Quarter 1948	1	-	331,664	-	193,374	-	-	-	11,590,332
2nd Quarter 1948	1	1	523,453	39	330,216	1	1	2	13,992,761
3rd Quarter 1948	1	-	598,758	-	364,508	-	-	-	14,973,781
4th Quarter 1948	-	-	480,937	-	285,847	-	-	-	12,443,083
Total.....	3	1	1,934,812	39	1,173,945	1	1	2	52,999,957
Western Air Lines									
1st Quarter 1949			59,400		23,550				1,445,054
2nd Quarter 1949			72,903		28,496				1,485,106
3rd Quarter 1949			75,142		31,036				1,714,474
4th Quarter 1949			64,534		27,054				1,693,019
Total.....			271,979		110,136				6,337,653
1st Quarter 1948			61,953		24,680				1,481,592
2nd Quarter 1948			70,142		28,745				1,557,337
3rd Quarter 1948			77,069		32,300				1,699,349
4th Quarter 1948			65,903		25,936				1,572,216
Total.....			275,067		111,661				6,310,494
Grand Total - Trunk Lines									
1st Quarter 1949	6	-	2,780,362	-	1,424,758	-	-	-	69,180,846
2nd Quarter 1949	5	-	3,927,007	-	1,894,910	-	-	-	78,891,990
3rd Quarter 1949	9	1	4,006,951	12	1,932,236	1	1	1	82,498,076
[illegible]	[illegible]	[illegible]	[illegible]	81	1,617,446	2	2	4	75,501,854
[illegible]	[illegible]	[illegible]	[illegible]	93	6,869,350	3	3	5	306,072,766
1st Quarter 1948	11	3	2,326,912	11	1,223,432	2	2	3	66,613,814
2nd Quarter 1948	8	1	3,331,887	39	1,647,557	1	1	2	77,054,574
3rd Quarter 1948	11	1	3,562,031	33	1,718,213	1	1	2	82,713,433
4th Quarter 1948	14	-	3,103,208	-	1,506,163	-	-	-	74,812,696
Total.....	44	5	12,324,038	83	6,095,365	4	4	7	301,194,517

1/ Revenue passengers only.
2/ Both revenue and non-revenue.
3/ In scheduled passenger operations.

NOTE: Excludes propeller accidents to persons.

TYPE OF ACCIDENT VS OPERATIONAL PHASE IN SCHEDULED DOMESTIC TRUNK, FEEDER AND TERRITORIAL AIR CARRIER PASSENGER OPERATIONS
(Calendar Years 1949 and 1948)

TABLE III

Type of Accident	OPERATIONAL PHASE														Total
	Taxying			Take Off			Normal Flight	Landing				Ground			
	To Take Off	From Landing	Other	Run	Climb	Discontinued		Approach	Level Off	Roll	Go Around	Start Engine	Idling	Other	
Ground, or water loop															
1949		-			-					1 a/					1
1948		1			1					-					2
Wheels up-down															
1949		-							-	1					1
1948		1							1	1					3
Hard landing															
1949									1						1
1948									1						1
Clps.- retract. landing gear															
1949	-	-								-				-	-
1948	3 a/	1								4 a/				1	9
Overshoot															
1949										3					3
1948										5 b/					5
Undershoot															
1949								2							2
1948								-							-
Nose up-over															
1949										1 a/					1
1948										-					-
Collision two aircraft															
Airborne															
1949							2	1							3
1948							-	-							-
Both on ground															
1949	-	-	-											1	1
1948	2 a/	2	1											-	5
Collision - ground															
1949							-				-				-
1948							1				2 a/				3

TABLE III (Continued)

Type of Accident	OPERATIONAL PHASE														Total
	Taxying			Take Off			Normal Flight	Landing				Ground			
	To Take Off	From Landing	Other	Run	Climb	Discontinued		Approach	Level Off	Roll	Go Around	Start Engine	Idling	Other	
Collision - objects															6
1949	1	1		1			1	-		2					8
1948	3a/	-		-			-	3a/		2					
Stall															3
1949					1			1			1				1
1948					1			-			-				
Fire on ground														-	-
1949														1	1
1948															
Fire in air															2
1949					-		2								5
1948					1		4								
Airframe failure										1a/					1
1949					-		-			-					3
1948					1		2								
Other															4
1949				1d/	1d/		2e/								6
1948				-	-		6f/								
Total															
1949	1	1	-	2	2	-	7	4	1	9	1	-	-	1	29
1948	8	5	1	-	4	-	13	3	2	12	2	-	-	2	52

a/ Includes 1 Feeder accident.
b/ Includes 2 Feeder accidents.
c/ Includes 1 Territorial accident.
d/ Prop. failure.
e/ One accident involved hailstorm and one involved severe pitching in air.
f/ Two accidents involved hailstorm, two involved turbulent air, one powerplant failure and one prop. failure.

Excludes propeller accidents to persons.

TYPE OF ACCIDENT VS INJURY AND DAMAGE IN SCHEDULED DOMESTIC TRUNK, FEEDER AND TERRITORIAL AIR CARRIER PASSENGER OPERATIONS
(Calendar Years 1949 and 1948)

TABLE IV

Type of Accident	Injury Index			Total	Aircraft Damage		
	Fatal	Serious	Minor-None		Destroyed	Substantial	Minor-None
Ground, or water loop							
1949			1 a/	1		1	
1948			2	2		2	
Hard landing							
1949			1	1	1		
1948			1	1	1		
Wheels up-down							
1949			1	1		1	
1948			3	3		3	
Clps.-retract. landing gear							
1949			-	-		-	
1948			9 c/	9		9	
Overshoot							
1949		1	2	3		2	1
1948		-	5 b/	5		5	-
Undershoot							
1949			2	2		2	
1948			-	-		-	
Nose up-over							
1949			1 a/	1		1	
1948			-	-		-	
Collision—two aircraft							
Both airborne							
1949	2		1	3	2	1	
1948	-		-	-	-	-	
Both on ground							
1949			1	1		1	
1948			5 a/	5		5	
Collision-ground or water							
1949	-		-	-	-	-	
1948	1		2 a/	3	2	1 a/	
Collision—objects							
1949	-		6	6	-	6	
1948	1		7 b/	8	2	6 b/	
Stall							
1949	2	1		3	3		
1948	1	-		1	1		
Fire on ground							
1949			-	-		-	
1948			1	1		1	
Fire in air							
1949			2	2		2	
1948			5	5		5	
Airframe failure							
1949	-		1 a/	1	-	1	
1948	1		2	3	1	2	
Other							
1949	-	1	3	4		3	1
1948	1	2	3	6		4	2
Total							
1949	4	3	22	29	6	21	2
1948	5	2	45	52	7	43	2
Propeller accidents to persons							
1949	2			2			2
1948	-			-			-
Grand Total							
1949	6	3	21	31	6	21	4
1948	5	2	45	52	7	43	2

a/ Includes 1 Feeder accident.
b/ Includes 2 Feeder accidents.
c/ Includes 1 Feeder and 1 Territorial accident.

OPERATIONAL PHASE VS INJURY AND DAMAGE IN SCHEDULED DOMESTIC TRUNK FEEDER AND TERRITORIAL AIR CARRIER PASSENGER OPERATIONS
(Calendar Years 1949 and 1948)

TABLE V

Operational Phase	Injury Index			Total	Aircraft Damage		
	Fatal	Serious	Minor-None		Destroyed	Substantial	Minor-None
Taxying							
To take off							
1949			1	1		1	
1948			8a/	8		8	
From landing							
1949			1	1		1	
1948			5	5		5	
Other							
1949			-	-		-	
1948			1	1		1	
Take Off							
Run							
1949			2	2		2	
1948			-	-		-	
Climb							
1949	-	1	1	2	1	1	
1948	1	-	3	4	1	3	
Flight							
Normal							
1949	1	1	5	7	1	5	1
1948	3	2	8	13	2	9	2
Landing							
Approach							
1949	2		2	4	2	2	
1948	1		2b/	3	1	2b/	
Level Off							
1949			1	1	1	-	
1948			2	2	1	1	
Roll							
1949		1	8c/	9	-	8c/	1
1948		-	12c/	12	1	11c/	-
Go around							
1949	1		-	1	1	-	
1948	-		2b/	2	1	1b/	
Ground							
Other							
1949			1	1		1	
1948			2	2		2	
Total							
1949	4	3	22	29	6	21	2
1948	5	2	45	52	7	43	2

a/ Includes 1 Territorial and 2 Feeder accidents.
b/ Includes 1 Feeder accident.
c/ Includes 3 Feeder accidents.

Excludes propeller accidents to persons.

PRIMARY CAUSE OF ACCIDENTS VS OPERATIONAL PHASE IN SCHEDULED DOMESTIC TRUNK, FEEDER AND TERRITORIAL AIR CARRIER PASSENGER OPERATIONS
(Calendar Years 1949 and 1948)

TABLE VI

Primary Cause	OPERATIONAL PHASE														Total
	Taxying			Take Off			Normal Flight	Landing				Ground			
	To Take Off	From Landing	Other	Run	Climb	Discontinued		Approach	Level Off	Roll	Go Around	Start Engine	Idling	Other	
Pilot Error															
Misuse, powerplant and controls															
1949				1											1
1948				-											-
Misuse brakes, flight controls, gr..															
1949										-					-
1948										1					1
Failure to retract or extend gear															
1949		-							-						-
1948		2							1						3
Selected unsuitable terrain															
1949	-									-					-
1948	1									1					2
Misjudged distance															
1949	-		-					2		2	-				4
1948	1[a]		1					-		2[a]	2[a]				6
Failure to observe, aircraft, objs..															
1949	-	-					1							1	2
1948	3[a]	1					-							-	4
Failed to maintain flying speed															
1949					1			1							2
1948					-			-							-
Improper instrument operation															
1949								-							-
1948								1							1
Operating recklessly															
1949		-													-
1948		1													1
Other Personnel Error															
Inadequate maintenance, aircraft															
1949	-						1			1[a]					2
1948	1[b]						-			-					1

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TABLE VI (Continued)

Primary Cause	OPERATIONAL PHASE														Total
	Taxying			Take Off			Normal Flight	Landing				Ground			
	To Take Off	From Landing	Other	Run	Climb	Discontinued		Approach	Level Off	Roll	Go Around	Start Engine	Idling	Other	
Other Personnel Error (Continued)															
Improper operation, airport facilities															
1949		1													1
1948		-													-
Other															
1949							1								1
1948							-								-
Powerplant															
Fuel system															
1949							-								-
1948							3								3
Engine structure															
1949					-		1								1
1948					1		-								1
Propeller and prop. accessories															
1949				1	1		-		1						3
1948				-	-		2		-						2
Engine accessories															
1949							-								-
1948							1								1
Undetermined															
1949														-	-
1948														1	1
Airframe															
Flight-control system															
1949							1								1
1948							-								-
Wings, flaps															
1949							-								-
1948							1								1
Miscellaneous															
1949					-										-
1948					1										1

TABLE VI (Continued)

Primary Cause	OPERATIONAL PHASE														Total
	Taxying			Take Off			Normal Flight	Landing				Ground			
	To Take Off	From Landing	Other	Run	Climb	Discontinued		Approach	Level Off	Roll	Go Around	Start Engine	Idling	Other	
Landing Gear															
Main landing gear assembly															
1949	-									1a/				-	1
1948	1									1a/				1	3
Nose wheel															
1949										-					-
1948										4					4
Brakes															
1949		-													-
1948		1													1
Other															
1949										1					1
1948										-					-
Equipment and Accessories															
Hydraulic system															
1949										1					1
1948										-					-
Other															
1949					-										-
1948					1										1
Weather															
Rain - fog															
1949									-						-
1948									1						1
Snow - hail															
1949							1								1
1948							2								2
Unfavorable wind conditions for landing, taxying															
1949										1					1
1948										1a/					1
Turbulence in flight															
1949							-								-
1948							3								3
Downdraft - updraft															
1949								-							-
1948								1							1

TABLE VI (Continued)

Primary Cause	OPERATIONAL PHASE														Total
	Taxying			Take Off			Normal Flight	Landing				Ground			
	To Take Off	From Landing	Other	Run	Climb	Discontinued		Approach	Level Off	Roll	Go Around	Start Engine	Idling	Other	
Airport - Terrain															
Soft															
1949	1														1
1948	-														-
Snow - ice															
1949										2a/					2
1948										2					2
Other hazard															
1949	-														-
1948	1														1
Miscellaneous															
Bird collision															
1949							1	-							1
1948							-	1a/							1
Other															
1949							-								-
1948							1								1
Undetermined															
1949					-										-
1948					1										1
Still in process															
1949								1			1				2
1948								-			-				-
Total															
1949	1	1	-	2	2	-	7	4	1	9	1	-	-	1	29
1948	8	5	1	-	4	-	13	3	2	12	2	-	-	2	52
Propeller accidents to persons															
1949													2		2
1948													-		-
GRAND TOTAL															
1949	1	1	-	2	2	-	7	4	1	9	1	-	2	1	31
1948	8	5	1	-	4	-	13	3	2	12	2	-	-	2	52

a/ Includes 1 Feeder accident.
b/ Territorial accident.

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COMPARATIVE SAFETY RECORD OF INDIVIDUAL U. S. DOMESTIC FEEDER
AIR CARRIERS IN SCHEDULED PASSENGER OPERATIONS
(Calendar Years 1949 and 1948 by Quarters)

TABLE VII

Operators	Accidents Total	Accidents Fatal	Passengers Carried[1]	Passengers Fatal[2]	Passenger[2] Miles (000)	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue[3] Plane Miles
All American Airways, Inc.[4]									
1st Quarter 1949			809		145				40,775
2nd " 1949			16,876		2,435				482,259
3rd " 1949			33,961		5,008				740,981
4th " 1949			21,785		3,384				702,239
Total.....			73,431		10,972				1,966,254
Did not carry passengers in 1948.									
Bonanza Air Lines, Inc.[5]									
4th Quarter 1949			352		106				30,658
Central Airlines, Inc.[6]									
3rd Quarter 1949			56		6				16,179
4th " 1949			767		163				336,626
Total.....			823		169				352,805
Challenger Airlines Co.									
1st Quarter 1949	1		5,863		1,901				381,512
2nd " 1949	-		7,762		2,528				438,772
3rd " 1949	-		10,850		3,264				409,305
4th " 1949	-		5,320		1,799				290,412
Total.....	1		29,795		9,492				1,520,001
1st Quarter 1948			3,256		938				308,822
2nd " 1948			5,399		1,639				351,154
3rd " 1948			7,857		2,330				371,319
4th " 1948			4,816		1,439				338,495
Total.....			21,328		6,346				1,369,790

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TABLE VII (Continued)

Operators	Accidents Total	Accidents Fatal	Passengers Carried[1]	Passengers Fatal[2]	Passenger[2] Miles (000)	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue[3] Plane Miles
Empire Airlines									
1st Quarter 1949			6,765		1,555				242,224
2nd " 1949			9,289		2,247				274,339
3rd " 1949			9,952		2,293				277,351
4th " 1949			7,756		1,924				267,884
Total.....			33,762		8,019				1,061,798
1st Quarter 1948	1		2,880		762				228,704
2nd " 1948	-		6,302		1,641				251,623
3rd " 1948	-		6,826		1,666				259,494
4th " 1948	-		6,640		1,494				252,798
Total.....	1		22,648		5,563				992,619
Florida Airways, Inc.[7]									
1st Quarter 1949			3,026		451				193,120
Discontinued operations 3/28/49									
1st Quarter 1948	-		2,291		372				20[illegible],111
2nd " 1948	-		4,087		587				205,745
3rd " 1948	1		2,867		452				203,701
4th " 1948	-		3,015		469				202,401
Total.....	1		12,260		1,880				817,958
Mid-West Airlines[8]									
4th Quarter 1949			529		113				160,356
Monarch Air Lines									
1st Quarter 1949			4,678		1,478				389,792
2nd " 1949			8,128		2,471				442,883
3rd " 1949			10,655		3,102				468,696
4th " 1949			7,114		2,123				443,027
Total.....			30,575		9,174				1,744,398
1st Quarter 1948			4,034		1,102				349,515
2nd " 1948			7,632		2,087				412,896
3rd " 1948			10,171		3,017				457,778
4th " 1948			6,358		1,892				430,053
Total.....			28,195		8,098				1,650,242

TABLE VII (Continued)

Operators	Accidents Total	Accidents Fatal	Passengers Carried[1]	Passengers Fatal[2]	Passenger[2] Miles (000)	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue[3] Plane Miles
Piedmont Aviation, Inc.[9]									
1st Quarter 1949			12,894		2,990				604,786
2nd " 1949			22,646		5,108				761,413
3rd " 1949			26,844		6,070				823,979
4th " 1949			23,770		5,459				861,024
Total.....			86,154		19,627				3,051,202
1st Quarter 1948	-		938		282				53,484
2nd " 1948	-		8,480		2,206				411,901
3rd " 1948	-		16,254		3,951				578,192
4th " 1948	1		13,698		3,405				556,467
Total.....	1		39,370		9,844				1,600,044
Pioneer Air Lines									
1st Quarter 1949			20,110		6,000				879,721
2nd " 1949			28,490		8,389				984,758
3rd " 1949			28,089		8,376				1,008,177
4th " 1949			27,423		7,946				948,976
Total.....			104,112		30,711				3,821,632
1st Quarter 1948	-		14,493		4,101				581,444
2nd " 1948	1		25,126		7,104				828,519
3rd " 1948	-		26,801		7,838				998,284
4th " 1948	-		27,435		7,827				1,017,508
Total.....	1		93,855		26,870				3,425,755
Purdue Aeronautics Corp.									

Data not yet available.

TABLE VII (Continued)

Operators	Accident Total	Accident Fatal	Passengers Carried[1]	Passengers Fatal[2]	Passenger[2] Miles (000)	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue[3] Plane Miles
Robinson Airlines, Corp.[10]									
1st Quarter 1949	-		7,725		1,269				187,293
2nd " 1949	1		10,943		1,775				208,096
3rd " 1949	-		11,466		1,888				247,640
4th " 1949	-		11,181		1,839				267,755
Total.....	1		41,315		6,771				910,784
1st Quarter 1948	-		-		-				-
2nd " 1948	-		-		-				-
3rd " 1948	-		766		123				16,566
4th " 1948	1		7,407		1,209				159,276
Total.....	1		8,173		1,332				175,842
Southern Airways, Inc.[11]									
1st Quarter 1949			-		-				-
2nd " 1949			242		69				19,790
3rd " 1949			4,501		989				334,242
4th " 1949			5,922		1,250				465,337
Total.....			10,665		2,308				819,369
Not operating in 1948									
Southwest Airways									
1st Quarter 1949			20,892		4,283				581,940
2nd " 1949			32,354		6,305				607,470
3rd " 1949			36,546		6,995				624,208
4th " 1949			24,781		4,976				586,289
Total.....			114,573		22,559				2,399,907
1st Quarter 1948			14,585		3,153				479,206
2nd " 1948			23,584		4,597				596,932
3rd " 1948			33,351		6,312				670,366
4th " 1948			25,904		5,204				603,792
Total.....			97,424		19,266				2,350,296

TABLE VII (Continued)

Operators	Accident Total	Accident Fatal	Passengers Carried[1]	Passengers Fatal[2]	Passenger Miles (000)[2]	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue Plane Miles[2]
Trans-Texas Airways									
1st Quarter 1949			6,959		1,919				565,044
2nd " 1949			11,862		3,290				743,856
3rd " 1949			15,439		3,841				789,247
4th " 1949			15,504		3,722				811,420
Total.....			49,764		12,772				2,909,567
1st Quarter 1948	-		2,389		701				321,753
2nd " 1948	1		3,972		1,102				379,645
3rd " 1948	-		7,177		2,138				567,640
4th " 1948	-		8,731		2,404				575,248
Total.....	1		22,269		6,345				1,844,286
Turner Airlines, Inc.[12]									
Not operating 1st 3 Quarters 1949									
4th Quarter 1949			559		100				35,530
West Coast Airlines									
1st Quarter 1949			10,921		1,521				276,318
2nd " 1949			19,342		2,692				326,029
3rd " 1949			24,341		3,370				359,926
4th " 1949			10,731		1,605				281,322
Total.....			65,335		9,188				1,243,595
1st Quarter 1948			10,842		1,430				267,163
2nd " 1948			18,851		2,394				312,283
3rd " 1948			25,728		3,489				356,259
4th " 1948			13,347		1,865				318,651
Total.....			68,768		9,178				1,254,356
E.W. Wiggins Airways[13]									
1st Quarter 1949			-		-				-
2nd " 1949			-		-				-
3rd " 1949			39		4				5,062
4th " 1949			381		40				64,357
Total.....			420		44				69,419

Not operating in 1948

TABLE VII (Continued)

Operators	Accident Total	Accident Fatal	Passengers Carried 1/	Passengers Fatal 2/	Passenger 2/ Miles (000)	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue 3/ Plane Miles
Wisconsin Central Airlines 14/									
1st Quarter 1949	-		3,287		568				288,863
2nd " 1949	1		8,514		1,406				381,081
3rd " 1949	-		12,279		2,042				476,392
4th " 1949	-		8,547		1,407				487,600
Total.....	1		32,627		5,423				1,633,936
1st Quarter 1948	-		343		73				50,345
2nd " 1948	-		2,624		520				192,345
3rd " 1948	1		5,062		1,034				304,470
4th " 1948	-		3,366		616				250,854
Total.....	1		11,395		2,243				798,014
Grand Total — Feeder Lines									
1st Quarter 1949	1		103,929		24,080				4,631,388
2nd " 1949	2		176,448		38,715				5,670,746
3rd " 1949	-		225,018		47,248				6,581,385
4th " 1949	-		172,422		37,956				7,040,812
Total.....	3		677,817		147,999				23,924,331
1st Quarter 1948	1		56,051		12,914				2,846,547
2nd " 1948	2		106,057		23,877				3,943,043
3rd " 1948	2		142,860		32,350				4,784,069
4th " 1948	2		120,717		27,824				4,705,543
Total.....	7		425,685		96,965				16,279,202

1/ Revenue passengers only.
2/ Both revenue and non-revenue.
3/ In scheduled passenger operations.
4/ Inaugurated passenger service 3/7/49.
5/ Inaugurated passenger service 12/19/49.
6/ Inaugurated passenger service 9/15/49.
7/ Carrier discontinued operations on 3/28/49 pursuant to Bd. order of 3/7/49.
8/ Inaugurated passenger service 10/21/49.
9/ " " " 2/20/48.
10/ " " " 9/19/48.
11/ " " " 6/10/49.
12/ " " " 11/12/49.
13/ " " " 9/19/49.
14/ " " " 2/24/48.

COMPARATIVE SAFETY RECORD OF INDIVIDUAL U. S. TERRITORIAL
AIR CARRIERS IN SCHEDULED PASSENGER OPERATIONS
(Calendar Years 1949 & 1948 by Quarters)

TABLE VIII

Operators	Accidents		Passengers		Passenger[2] Miles (000)	Crew Fatalities			Revenue[3] Plane Miles
	Total	Fatal	Carried[1]	Fatal[2]		Pilot	Copilot	Other	
Caribbean-Atlantic Airlines									
1st Quarter 1949			23,905		1,729				158,823
2nd " 1949			21,533		1,633				153,825
3rd " 1949			19,472		1,506				142,507
4th " 1949			13,662		1,143				127,826
Total.....			78,572		6,011				582,981
1st Quarter 1948	-		19,823		1,249				98,296
2nd " 1948	-		17,511		1,106				100,424
3rd " 1948	-		18,745		1,212				109,778
4th " 1948	1		18,322		1,186				111,973
Total.....	1		74,401		4,753				420,471
Hawaiian Airlines									
1st Quarter 1949			71,732		10,100				610,935
2nd " 1949			79,220		10,913				646,520
3rd " 1949			86,353		11,886				729,291
4th " 1949			65,963		8,842				633,386
Total.....			303,268		41,741				2,620,132
1st Quarter 1948			77,521		10,932				660,821
2nd " 1948			84,222		11,986				727,801
3rd " 1948			106,128		15,212				922,972
4th " 1948			76,100		10,532				628,969
Total.....			343,971		48,662				2,940,563

TABLE VIII (Continued)

Operators	Accidents Total	Accidents Fatal	Passengers Carried 1/	Passengers Fatal 2/	Passenger 2/ Miles (000)	Crew Fatalities Pilot	Crew Fatalities CoPilot	Crew Fatalities Other	Revenue 3/ Plane Miles
Trans-Pacific Airlines, Ltd. 4/									
1st Quarter 1949			-		-				-
2nd " 1949			4,960		758				59,531
3rd " 1949			22,501		3,539				277,884
4th " 1949			11,850		1,644				170,131
Total.....			39,311		5,941				507,546
Grand Total-Territorial Lines									
1st Quarter 1949			95,637		11,829				769,758
2nd " 1949			105,713		13,304				859,876
3rd " 1949			128,326		16,931				1,149,682
4th " 1949			91,475		11,629				931,343
Total.....			421,151		53,693				3,710,659
1st Quarter 1948	-		97,344		12,181				759,117
2nd " 1948	-		101,733		13,092				828,225
3rd " 1948	-		124,873		16,424				1,032,750
4th " 1948	1		94,422		11,718				740,942
Total.....	1		418,372		53,415				3,361,034

1/ Revenue passengers only.
2/ Both revenue and non-revenue.
3/ In scheduled passenger operations.
4/ Regularly scheduled operations, transporting passengers and property only, were inaugurated on June 6, 1949.

COMPARATIVE SAFETY RECORD OF U. S. FLAG SCHEDULED AIR CARRIERS
IN INTERNATIONAL PASSENGER OPERATIONS
(Calendar Years 1949 and 1948 by Quarters)

TABLE IX

Operators	Accidents		Passengers		Passenger[2] Miles (000)	Crew Fatalities			Revenue[3] Plane Miles
	Total	Fatal	Carried[1]	Fatal[2]		Pilot	Copilot	Other	
American Airlines									
1st Quarter 1949			18,009		18,722				545,464
2nd Quarter 1949			21,144		17,947				533,438
3rd Quarter 1949			23,531		20,360				542,741
4th Quarter 1949			19,437		16,482				564,971
Total.....			82,121		73,511				2,186,614
1st Quarter 1948	-		12,877		12,114				388,018
2nd Quarter 1948	1		18,737		14,051				478,511
3rd Quarter 1948	-		19,287		14,951				561,036
4th Quarter 1948	-		18,113		14,512				540,380
Total.....	1		69,014		55,628				1,967,945
American Overseas Airlines									
1st Quarter 1949	-		15,658		37,967				1,640,093
2nd Quarter 1949	-		23,777		55,160				2,083,392
3rd Quarter 1949	-		27,829		59,047				2,238,321
4th Quarter 1949	1		28,039		47,339				1,637,099
Total.....	1		95,303		199,513				7,598,905
1st Quarter 1948			8,490		25,087				1,374,984
2nd Quarter 1948			18,937		51,817				1,948,760
3rd Quarter 1948			28,588		61,974				2,401,860
4th Quarter 1948			19,602		43,775				1,684,919
Total.....			75,617		182,653				7,410,523

TABLE IX (Continued)

Operators	Accidents Total	Accidents Fatal	Passengers Carried[1]	Passengers Fatal[2]	Passenger[2] Miles (000)	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue[3] Plane Miles
Braniff Airways[4]									
1st Quarter 1949			2,408		6,511				308,211
2nd Quarter 1949			3,683		10,304				421,756
3rd Quarter 1949			3,557		10,173				432,346
4th Quarter 1949			3,632		10,107				512,768
Total.....			13,280		37,093				1,675,081
1st Quarter 1948			-		-				-
2nd Quarter 1948			288		619				69,544
3rd Quarter 1948			1,938		4,285				268,337
4th Quarter 1948			1,800		3,889				261,569
Total.....			4,026		8,793				599,450
Chicago & Southern Air Lines									
1st Quarter 1949	1		5,767		6,465				345,726
2nd Quarter 1949	-		6,150		7,747				372,762
3rd Quarter 1949	-		6,036		8,469				550,454
4th Quarter 1949	-		5,528		6,930				547,920
Total.....	1		23,481		29,611				1,816,862
1st Quarter 1948	-		2,909		2,115				121,930
2nd Quarter 1948	1		2,813		2,269				123,985
3rd Quarter 1948	-		4,738		4,649				242,716
4th Quarter 1948	1		5,012		5,461				317,849
Total.....	2		15,472		14,494				806,480
Colonial Airlines									
1st Quarter 1949			3,064		2,621				186,535
2nd Quarter 1949			4,219		3,723				180,483
3rd Quarter 1949			3,220		2,997				162,837
4th Quarter 1949			2,134		2,187				139,616
Total.....			12,637		11,528				669,471
1st Quarter 1948			4,415		3,642				166,878
2nd Quarter 1948			5,111		4,271				175,307
3rd Quarter 1948			4,211		3,694				170,635
4th Quarter 1948			2,800		2,503				182,811
Total.....			16,537		14,110				695,631

TABLE IX (Continued)

Operators	Accidents Total	Accidents Fatal	Passengers Carried 1/	Passengers Fatal 2/	Passenger 3/ Miles (000)	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue 4/ Plane Miles
Eastern Air Lines									
1st Quarter 1949			3,340		3,950				187,200
2nd Quarter 1949			4,085		4,325				189,280
3rd Quarter 1949			4,105		4,456				185,120
4th Quarter 1949			3,433		3,704				191,360
Total.....			14,963		16,435				752,960
1st Quarter 1948			3,906		4,089				187,320
2nd Quarter 1948			4,039		4,246				189,280
3rd Quarter 1948			5,016		5,268				187,236
4th Quarter 1948			3,100		3,296				189,280
Total.....			16,061		16,899				753,116
National Airlines									
1st Quarter 1949			14,024		4,246				132,132
2nd Quarter 1949			12,295		3,870				139,741
3rd Quarter 1949			19,373		5,616				175,823
4th Quarter 1949			12,915		3,878				149,014
Total.....			58,607		17,610				596,710
1st Quarter 1948			5,386		1,676				78,119
2nd Quarter 1948			5,399		1,796				105,088
3rd Quarter 1948			9,027		2,836				111,579
4th Quarter 1948			7,209		2,356				105,088
Total.....			27,012		8,664				399,874
Northwest Airlines									
1st Quarter 1949			7,491		15,605				1,446,584
2nd Quarter 1949			10,320		21,920				1,458,444
3rd Quarter 1949			11,192		23,443				1,442,630
4th Quarter 1949			8,984		18,605				1,478,375
Total.....			37,987		79,573				5,826,033
1st Quarter 1948			5,600		12,619				1,014,500
2nd Quarter 1948			6,741		14,106				1,013,067
3rd Quarter 1948			8,396		18,033				1,104,025
4th Quarter 1948			8,210		20,650				1,402,773
Total.....			28,947		65,408				4,534,365

TABLE IX (Continued)

Operators	Accidents Total	Accidents Fatal	Passengers Carried[1]	Passengers Fatal[2]	Passenger[2] Miles (000)	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue[3] Plane Miles
Pan American Airways (All Div.)									
1st Quarter 1949	1		243,603		269,342				13,894,615
2nd Quarter 1949	-		239,953		320,142				14,143,758
3rd Quarter 1949	1		268,827		363,915				15,348,544
4th Quarter 1949	2		205,842		271,279				13,613,812
Total.....	4		958,225		1,224,678				57,000,729
1st Quarter 1948	2	-	233,220	-	259,693	-	-	-	13,506,976
2nd Quarter 1948	3	1	219,931	20	295,166	1	1	8	14,176,137
3rd Quarter 1948	1	-	254,252	-	325,211	-	-	-	15,111,616
4th Quarter 1948	1	-	213,428	-	284,006	-	-	-	14,548,518
Total.....	7	1	920,831	20	1,164,076	1	1	8	57,343,247
Pan American Grace Airways									
1st Quarter 1949			24,287		30,903				1,342,724
2nd Quarter 1949			22,906		27,600				1,352,318
3rd Quarter 1949			21,977		25,674				1,444,970
4th Quarter 1949			23,790		28,284				1,444,466
Total.....			92,960		112,461				5,584,478
1st Quarter 1948			24,536		27,565				1,409,653
2nd Quarter 1948			22,908		28,032				1,397,949
3rd Quarter 1948			22,495		26,213				1,369,100
4th Quarter 1948			22,358		27,874				1,350,212
Total.....			92,297		109,684				5,526,914
Transcontinental & Western Air									
1st Quarter 1949	1		16,932		54,126				2,578,134
2nd Quarter 1949	1		28,769		84,562				3,411,250
3rd Quarter 1949	-		32,492		94,663				3,855,063
4th Quarter 1949	-		22,499		66,392				2,973,162
Total.....	2		100,692		299,743				12,817,609
1st Quarter 1948			12,549		41,031				2,320,165
2nd Quarter 1948			19,672		65,691				2,747,948
3rd Quarter 1948			27,205		86,073				3,627,301
4th Quarter 1948			22,517		72,376				3,170,176
Total.....			81,943		265,171				11,865,590

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TABLE IX (Continued)

Operators	Accidents Total	Accidents Fatal	Passengers Carried1/	Passengers Fatal2/	Passenger2/ Miles (000)	Crew Fatalities Pilot	Crew Fatalities Copilot	Crew Fatalities Other	Revenue3/ Plane Miles
United Air Lines									
1st Quarter 1949			6,128		14,518				519,227
2nd Quarter 1949			7,417		18,225				643,358
3rd Quarter 1949			8,733		21,372				631,200
4th Quarter 1949			4,748		11,979				616,879
Total.....			27,026		66,094				2,410,664
1st Quarter 1948	1		3,032		7,400				432,000
2nd Quarter 1948	-		5,343		12,949				444,000
3rd Quarter 1948	-		8,206		19,847				532,800
4th Quarter 1948	-		6,278		15,271				470,400
Total.....	1		22,859		55,467				1,879,200
Uraba, Medellin & Central Airways									
1st Quarter 1949			815		271				25,912
2nd Quarter 1949			798		268				25,564
3rd Quarter 1949			652		217				25,896
4th Quarter 1949			520		174				25,232
Total.....			2,785		930				102,604
1st Quarter 1948			719		241				41,216
2nd Quarter 1948			443		147				37,184
3rd Quarter 1948			532		176				33,864
4th Quarter 1948			546		183				25,232
Total.....			2,240		747				137,496
Grand Total - International Carriers									
1st Quarter 1949	3		361,526		465,247				23,152,557
2nd Quarter 1949	1		385,516		575,793				24,955,544
3rd Quarter 1949	1		431,524		640,400				27,035,945
4th Quarter 1949	3		341,501		487,340				23,894,674
Total.....	8		1,520,067		2,168,780				99,038,720
1st Quarter 1948	3	-	317,639	-	397,272	-	-	-	21,041,759
2nd Quarter 1948	5	1	330,353	20	495,160	1	1	8	22,906,760
3rd Quarter 1948	1	-	393,891	-	573,210	-	-	-	25,722,105
4th Quarter 1948	2	-	330,973	-	496,152	-	-	-	24,249,207
Total.....	11	1	1,372,856	20	1,961,794	1	1	8	93,919,831

1/ Revenue passengers only.
2/ Both revenue and non-revenue
3/ In scheduled passenger operations.
4/ Regular scheduled operations inaugurated 6/4/48.

TYPE OF ACCIDENT VS OPERATIONAL PHASE IN U. S. FLAG SCHEDULED AIR CARRIERS IN INTERNATIONAL PASSENGER OPERATIONS
(Calendar Years 1949 and 1948)

TABLE X

Type of Accident	OPERATIONAL PHASE														Total
	Taxying			Take Off			Normal Flight	Landing				Ground			
	To Take Off	From Landing	Other	Run	Climb	Discontinued		Approach	Level Off	Roll	Go Around	Start Engine	Idling	Other	
Clps.- retract.landing gear															
1949				-						-					-
1948				1						3					4
Undershoot															
1949								1							1
1948								-							-
Collision - two aircraft Airborne															
1949							1								1
1948							-								-
Collision - objects															
1949		1	1			-		2							4
1948		1	-			1		-							2
Collision - ground or water															
1949								-							-
1948								1							1
Fire in air															
1949							1								1
1948							3								3
Other															
1949				-			1a/								1
1948				1b/			-								1
Total															
1949	-	1	1	-	-	-	3	3	-	-	-	-	-	-	8
1948	-	1	-	2	-	1	3	1	-	3	-	-	-	-	11

a/ Involved turbulent air.
b/ Struck by bullets fired by unknown riflemen.

TYPE OF ACCIDENT VS INJURY AND DAMAGE IN U. S. FLAG SCHEDULED AIR CARRIERS IN INTERNATIONAL PASSENGER OPERATIONS
(Calendar Years 1949 and 1948)

TABLE XI

Type of Accident	Injury Index			Total	Aircraft Damage		
	Fatal	Serious	Minor-None		Destroyed	Substantial	Minor-None
Caps.-retract. ldg. gr.							
1949			-	-		-	
1948			4	4		4	
Undershoot							
1949			1	1		1	
1948			-	-		-	
Collision - two aircraft Airborne							
1949			1	1		1	
1948			-	-		-	
Collision--ground or water							
1949	-			-	-		
1948	1			1	1		
Collision--objects							
1949			4	4	-	4	
1948			2	2	1	1	
Fire in air							
1949			1	1		1	
1948			3	3		3	
Other							
1949		1	-	1		-	1
1948		-	1	1		1	-
Total							
1949	-	1	7	8	-	7	1
1948	1	-	10	11	2	9	-

PRIMARY CAUSE OF ACCIDENTS VS OPERATIONAL PHASE IN U. S. FLAG SCHEDULED AIR CARRIERS IN INTERNATIONAL PASSENGER OPERATIONS
(Calendar Years 1949 and 1948)

TABLE XII

Primary Cause	OPERATIONAL PHASE														Total
	Taxying			Take Off			Normal Flight	Landing				Ground			
	To Take Off	From Landing	Other	Run	Climb	Discon-tinued		Approach	Level Off	Roll	Go Around	Start Engine	Idling Engine	Other	
Pilot Error															
Misuse brakes, flight controls, ground															
1949			1												1
1948			-												-
Failure to retract or extend gear															
1949				-											-
1948				1											1
Misjudged distance															
1949		1						1							2
1948		-						-							-
Failure to observe aircraft, objects															
1949		-					1								1
1948		1					-								1
Improper instrument operation															
1949								2							1
1948								1							1
Other Personnel															
Inadequate maintenance, aircraft															
1949							-	-							1
1948							1	-							1
Other															
1949				-						-					-
1948				1						1					2
Powerplant															
Fuel system															
1949							-								-
1948							1								1
Engine structure															
1949							-								-
1948							1								1

TABLE XII (CONTINUED)

Primary Cause	OPERATIONAL PHASE														Total
	Taxying			Take Off			Normal Flight	Landing				Ground			
	To Take Off	From Landing	Other	Run	Climb	Discon-tinued		Approach	Level Off	Roll	Go Around	Start Engine	Idling Engine	Other	
Powerplant (continued)															
Engine accessories															
1949							1								1
1948							-								-
Landing gear															
Nose wheel															
1949										-					-
1948										2					2
Weather															
Turbulence in flight															
1949							1								1
1948							-								-
Miscellaneous															
Other															
1949						-									-
1948						1									1
Total															
1949	-	1	1	-	-	-	3	3	-	-	-	-	-	-	8
1948	-	1	-	2	-	1	3	1	-	3	-	-	-	-	11

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OPERATIONAL PHASE VS INJURY AND DAMAGE IN U. S. FLAG SCHEDULED
AIR CARRIERS IN INTERNATIONAL PASSENGER OPERATIONS
(Calendar Years 1949 and 1948)

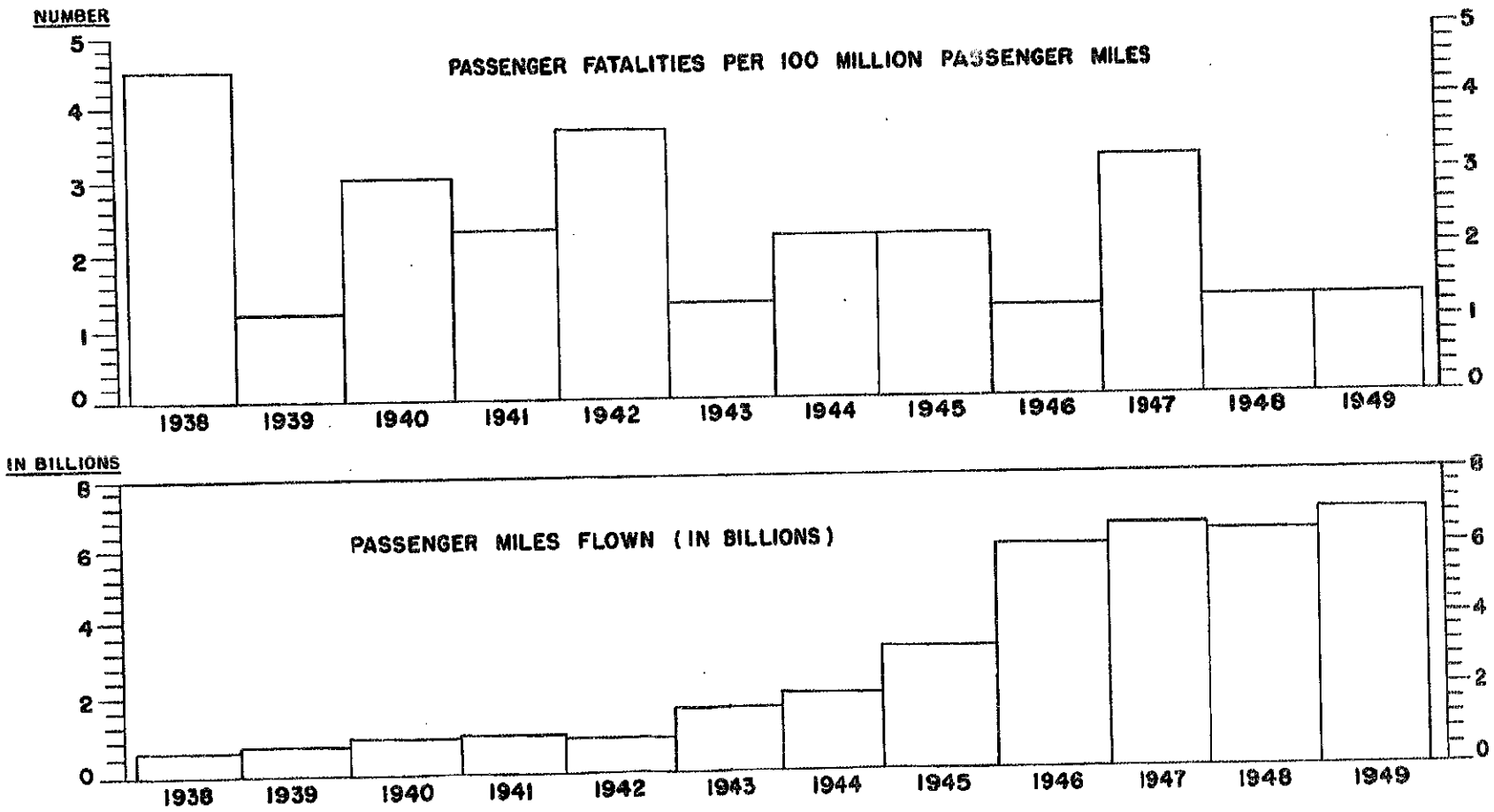
TABLE XIII

Operational Phase	Injury Index			Total	Aircraft Damage		
	Fatal	Serious	Minor-None		Destroyed	Substantial	Minor None
Taxying							
From landing							
1949			1	1		1	
1948			1	1		1	
Other							
1949			1	1		1	
1948			-	-		-	
Take Off							
Run							
1949			-	-		-	
1948			2	2		2	
Discontinued							
1949			-	-	-		
1948			1	1	1		
Flight							
Normal							
1949		1	2	3		2	1
1948		-	3	3		3	-
Landing							
Approach							
1949	-		3	3	-	3	
1948	1		-	1	1	-	
Roll							
1949			-	-		-	
1948			3	3		3	
Total							
1949	-	1	7	8	-	7	1
1948	1	-	10	11	2	9	-

CHART A

PASSENGER FATALITY RATE AND PASSENGER MILES IN DOMESTIC AIR CARRIER SCHEDULED PASSENGER CARRYING OPERATIONS

CALENDAR YEARS 1938 - 1949

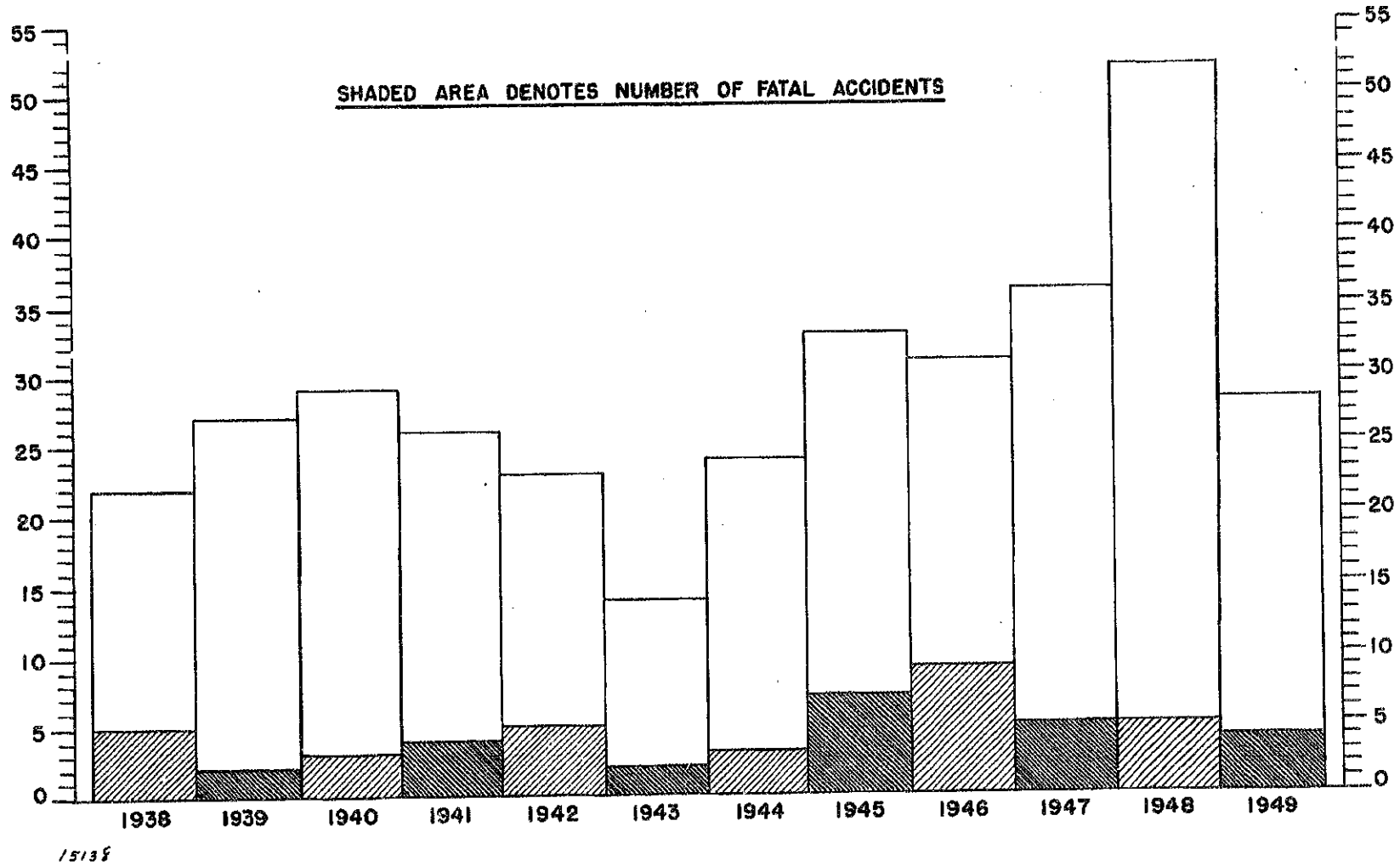


15138

ACCIDENT ANALYSIS DIVISION
BUREAU OF SAFETY INVESTIGATION
CIVIL AERONAUTICS BOARD
JUNE - 1950

CHART B

NUMBER OF AIR CARRIER ACCIDENTS IN
SCHEDULED DOMESTIC PASSENGER CARRYING OPERATIONS
CALENDAR YEARS 1938 — 1949



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ACCIDENT ANALYSIS DIVISION
BUREAU OF SAFETY INVESTIGATION
CIVIL AERONAUTICS BOARD

JUNE — 1950

RESUME OF U.S. AIR CARRIER ACCIDENTS
(CALENDAR YEAR 1948)

Details of accidents in (1) scheduled, (2) irregular and (3) Alaskan air carrier operations during 1948 are contained in the following pages. The accidents are shown according to the classes of operation conducted by the three air carrier groups noted from the standpoints of date, location of accident, operator, equipment, total personnel aboard, injury division among crew and passengers and aircraft damage. Indication is made whether accident occurred at night and if fire in air or after impact was involved. A brief description of each accident is included.

June 1949

AIR CARRIER ACCIDENTS - CALENDAR YEAR 1948

A. Scheduled Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N*	Aircraft Damage	Fire: In Air	Fire: After Impact
1/1/48		Atlanta, Georgia	EAL	DC-3	14	-	-	-	3	-	-	-	11	Subst.**		

On landing at Atlanta, the flight was given Runway 15 with wind southeast variable at 30, gusty to 40, occasionally 45. While turning onto the base leg, the flight was advised that the wind had shifted and was south-southwest with strong gusts. The flight being low, continued on into Runway 15 although the Captain at first considered pulling up and had moved the landing gear latch handle to the unlocked position. Deciding to continue on in, he attempted to lock the gear again but was unable to do so. He then placed the landing gear handle in the down position, checked the hydraulic pressure and made the landing. Again the Captain attempted to lock the gear but could not do so and so started taxying in. A 180 degree turn in gusty air was completed when the left gear folded, followed by the right gear. Investigation disclosed that the Captain had not allowed sufficient time to operate the gear by the regular procedure, as by moving the latch handle first he had placed the mechanism in the spring loaded position. Whereas he first should have placed the landing gear selector handle in the down position.

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N*	Aircraft Damage	Fire: In Air	Fire: After Impact
1/8/48	Yes	Birmingham, Alabama	Delta	DC-3	24	-	-	-	3	-	-	-	21	Subst.		

After encountering some difficulty with the landing gear mechanism at Meridian, Mississippi, the flight continued on to Birmingham. Here the red light showed when the gear was lowered. However, as the difficulty appeared to be the same as that previously encountered, a landing was made with no brakes being used. When almost to a stop a right turn was started but after completing about 45 degrees of the turn, the left gear collapsed and the aircraft came to rest on the left wing tip. No evidence could be found to indicate a mechanical failure although damage to the gear would prevent any definite determination. It was brought out, however, that the Captain was not thoroughly familiar with the gear mechanism and didn't realize that a turn should not have been made under the circumstances until pins were inserted. The company also failed to furnish any instruction on this in their pilot's manual.

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N*	Aircraft Damage	Fire: In Air	Fire: After Impact
1/11/48		Pullman, Washington	Empire	Boeing 247-D	7	-	-	-	2	-	-	-	5	Subst.		

While taxying out for take-off, pilot failed to observe a post anchoring the door track of a small hangar off the edge of the taxy strip and struck the post with the left wing tip of the plane.

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N*	Aircraft Damage	Fire: In Air	Fire: After Impact
1/13/48	Yes	Nr. Oxon Hill, Md.	EAL	DC-3	9	2	-	1	-	3	2	1	-	Destroyed		

E. A. L. Flight 572 enroute from Atlanta to Washington was cleared to Doncaster Marker with permission to descend to 2,500 feet after crossing Doncaster. As another E.A.L. flight was approaching Washington at this time from the Northwest, flight 572 was

* F - Fatal; S - Serious; M - Minor; N - None
** Subst. - Substantial

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NOT REPRODUCIBLE

A. Scheduled Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
1/13/48		Nr. Oxon Hill, Md. (Continued).														

instructed to climb to 3,500 feet. The Captain replied that he was then contact and requested the reason for climbing. At this time, the second E.A.L. flight, No. 454 reported on contact so flight 572 was again cleared on 2,500 feet. Flight 454 was picked up on the tower's surveillance radar scope and precision beam radar scope until it had landed but flight 572 was never picked up. It was learned that it had flown into the ground 5.2 miles south of the airport, crashing into wooded terrain. First contact was made when the right wing tip struck a tree 106 feet above sea level. The ship had struck on a heading straight toward the runway and in a level or slightly climbing attitude. Investigation disclosed no malfunction of aircraft or facilities. The procedure in EAL's operation manual required a minimum approach altitude of 1,500 feet when over Mt. Vernon. It is apparent that the flight was not at this altitude as it never appeared in the radar scopes. Highly variable cloud conditions were a contributing factor as the pilot attempted to remain on contact into the field and so failed to maintain sufficient altitude to clear obstructions.

Date	At Night	Location	Operator	Equipment	Total Aboard	Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
1/21/48	Yes	E. Boston, Mass.	EAL	Lockheed 649	25	-	-	-	5	-	-	5	15	Destroyed		Yes

On the scheduled flight from Miami to Newark, the part of it to Philadelphia was made in routine fashion. After passing Philadelphia, the flight was cleared to La Guardia instead. A position report as over Freehold, N. J. was made which later events proved to be in error by five minutes. At La Guardia the approach was missed, the plane passing ½ mile to the right of the designated runway after which the pilot reported the ceiling under 500 feet and requested clearance to Boston which was granted. At Boston a straight in, ILS approach was made and the plane landed on runway 4 where ½ inch of new fallen snow was laying. Shortly after the touchdown 2,000 feet from the approach end, the left gear struck snow drifts causing plane to turn to the left changing its direction suddenly and to crash into a large snowbank on the left. Fire broke out in the vicinity of Nos. 3 and 4 engines and spread inboard to the fuselage. The occupants left from the rear door and the aircraft was practically destroyed by the fire.

Date	At Night	Location	Operator	Equipment	Total Aboard	Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
1/30/48		New York, New York	TWA	Boeing 307	28	-	-	-	3	-	-	-	25	Subst.		

The flight was ready for take-off and in running up engines, roughness developed in No. 2 engine on left magneto. Plane was returned to the ramp at which time fire broke out in back of No. 2 engine. The Captain pulled fire extinguisher and fire went out. Origin of fire was not discovered.

Date	At Night	Location	Operator	Equipment	Total Aboard	Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
1/31/48		New York, New York	EAL	DC-3	6	-	-	-	3	-	-	-	3	Subst.		

While taxying, the right side of the landing gear retracted. Examination disclosed this failure to be due to the failure of the threads of the two bolts holding the landing gear latch to the front spar of the wing, allowing the latch to pull away from the spar.

A. Scheduled Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
2/7/48		Bunnell, Florida	EAL	Lockheed 649	69	1	-	-	5	-	1	1	61	Subst.		

While cruising at 22,000 feet enroute from La Guardia for W. Palm Beach, there was a sudden loud noise and severe vibration. Power was reduced and a descent started. Depressurization of the cabin had occurred, the engine instruments were not functioning and No. 3 engine was vibrating. Soon after this, the propeller and parts of No. 3 engine dropped from the aircraft and vibration ceased. It was then discovered that parts of the propeller had been driven through the fuselage at the galley area and had killed a purser. No. 3 engine continued operating until lack of oil froze it. As the descent continued there was a pronounced left yaw, which was partially corrected by power to engines 1 and 2. A landing under extreme difficulty was made at Bunnell, Florida in which abnormal use of the left brake was necessary and the left outboard tire blew out. A fire in the right landing gear was extinguished when the plane stopped. Further study of No. 3 engine and the type of propeller engine installation being used is now being made.

2/15/48	Yes	Chicago, Illinois	TWA	Boeing 307	30	-	-	-	5	-	-	-	25	Subst.	Yes	

Number 4 engine backfired two or three times as plane was being taxied to take-off position. Shortly after take-off, the pilot noticed that No. 4 throttle stuck for several seconds as it was being reduced and at this time the Hostess reported fire in No. 4 engine. The propeller was feathered and the fire extinguished by means of CO_2. Evidence indicates that the backfires prior to take-off had caused the failure of the carburetor air scoop adaptor clamp, thus permitting flames from the backfires to ignite accumulations of fluid around carburetor. Air ramming through the air scoop increased the intensity of the fire until it burned through the hydraulic lines of the cowl flap control. The hydraulic fluid released supported combustion for several minutes. Steps were taken to prevent a repetition of this failure.

2/16/48		Chicago, Illinois	TWA	L-049 C-46	45	-	-	4	-	-	-	-	41	Subst.		

After landing, the plane was turned off the runway onto an old runway which was closed and used for parking only. Here it taxied into a parked, partially dismantled Slick Airways C-46, damaging both aircraft.

2/24/48	Yes	Bellingham, Washington	UAL	DC-3	16	-	-	-	4	-	-	-	12	Subst.		

Pilot inadvertently taxied into a dead end revetment strip where he had to turn around in a narrow space. An abandoned service pit about four feet deep with no cover on it was in this area and was struck by the tail wheel which fell into the opening, damaging the aircraft tail assembly severely.

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A. Scheduled Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
3/10/48	Yes	Chicago, Illinois	Delta	DC-4	13	4	-	-	-	8	1	-	-	Destroyed		Yes

The flight made what appeared to be a normal take-off until an altitude of 150 to 200 feet had been reached, at which point the plane assumed a very steep climbing attitude. At 500 to 800 feet the nose and right wing dropped and the plane crashed to the ground. Fire followed immediately. Extensive investigation failed to disclose any evidence of mechanical malfunctioning or structural failure of the plane. The plane was properly loaded and the weather was not conducive to the formation of ice. The probable cause must remain as loss of longitudinal control for reasons undetermined.

3/10/48		Tulsa, Oklahoma	AA	DC-4	33	-	-	-	3	-	-	-	30	Subst.		

On take-off run, the nosewheel struck a snowdrift damaging it so that it could not be raised. Pilot proceeded to Dallas where better weather conditions prevailed. Nosewheel was held off ground on landing until speed was lost. On contact, nosewheel centered itself and landing was completed without mishap. Inspection showed that steering arm support bracket had been broken.

4/24/48	Yes	Wichita Falls, Texas	Continental	DC-3	17	-	1	-	3	-	-	1	12	Minor		

While the flight was approaching Wichita Falls, extreme turbulence was momentarily encountered. The hostess was in the aisle at the time and was thrown across a seat, injuring her severely. An infant was thrown from its mothers lap, suffering a cut on the head. After the flight landed, a flight agent opening the door received a static electrical charge which knocked him to the ground, but he was not seriously injured.

4/28/48		Nr. Toledo, Ohio	AA	DC-6	52	-	-	-	4	-	-	-	48	Subst.		Yes

After reaching cruising altitude all main tanks were switched to their respective alternates and the booster pumps were shut off. Immediately thereafter fuel pressure and fuel flow for No. 3 engine dropped suddenly followed by the overspeeding of the propeller. The propeller was feathered and it was found that No. 3 engine was on fire. The CO_2 selector for that engine was pulled, the cowl flaps opened 4 degrees and a dive was started. The fire went out and the flight was continued on to Cleveland. On the final approach the Stewardess advised that a fire existed in No. 2 zone of No. 3 engine and the CO_2 extinguisher for that zone was discharged. The landing was made, no fire was found and the ship was towed to the ramp and passengers deplaned. Investigation disclosed that in high blower, cutting of the mixture control, then placing the propeller in fixed pitch followed by a return to auto-lean position, results in the overreving of the propeller above the tachometer range (when throttles are left in cruising position) as the governor is apparently unable to handle this load. This probably resulted in failure of the blower at around 3300 rpm. Damage done by pieces of the blower to the intake manifold and exhaust stack allowed hot exhaust gasses to ignite gasoline in No. 1 zone and this fire passed to No, 2 zone through a hole in the diaphragm also caused by the impeller. The gasoline fire no doubt ignited oil and hydraulic fluid. Fortunately the crew was able to extinguish this fire.

A. Scheduled Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
5/3/48	Yes	New York, New York	AA	DC-6	37	-	-	-	4	-	-	-	33	Subst.		

On the landing, normal contact was made on the main wheels. The nose, however, which had been dropping normally, continued on down past its usual level position and the warning horn began to sound. The plane was brought to a stop and the passengers quickly deplaned. Investigation failed to disclose any failure or malfunction in the gear and it is believed that inadvertent operation of the landing gear control instead of flap control may have occurred though such has not been substantiated, to date.

5/7/48		Nr. El Paso, Texas	AA	DC-6	34	-	-	-	4	-	-	-	30	Subst.	Yes	

Flight departed El Paso and climbed to 17,000 feet. Then with alternate tank fuel booster pumps on low speed, the fuel tank selectors were changed from "main" to "alternate" and the fuel pumps turned off. At this time the fuel warning light came on and Nos. 3 and 4 engines surged. Power on these engines were reduced, propellers put into fixed pitch and the fuel pumps turned onto high speed. No. 4 propeller was feathered just as the fire warning light for No. 2 zone of No. 3 engine came on. No. 3 propeller was then feathered. The firewall shut off valve for No. 3 engine selector was pulled and the right hand CO_2 charge was fired. The fire warning light went off immediately although considerable smoke and flames were seen issuing from No. 3 nacelle by the cabin occupants. The flight returned to El Paso and landed without further incident, with damage being confined to the No. 3 engine. A punctured derichment diaphragm in the carburetor of No. 3 was found, which possibly could have caused the fire by dripping fuel on the generator, combustion occurring and vaporizing the fuel in lines and carburetor causing a loss of fuel flow.

5/25/48		Nr. Midland, Texas	AA	DC-6	34	-	-	-	4	-	-	-	30	Subst.		

While cruising in the vicinity of Midland, Texas, sudden, severe and unpredicted hail was encountered. A left turn was made and the flight was out of the hail in a matter of minutes. Considerable damage was sustained by the aircraft as the hailstones were estimated to be about 3/4 inch in diameter. Flight descended and continued to El Paso where a safe landing was made.

5/28/48		Galveston, Texas	Trans-Texas Airways	Two DC-3's	2	-	-	-	2	-	-	-	-	Subst.	(NC 17331)	
					17	-	-	-	2	-	-	-	15		(Braniff NC 21776)	

NC 21776 was holding (awaiting ATC clearance) and somewhat blocked the taxy way as NC 17331 was being taxied to take-off position. Pilot in NC 17331 attempted to pass the other aircraft and in doing so, misjudged his clearance - the left wing tip was damaged on collision with right wing of NC 21776.

6/12/48		Harrisburg, Pennsylvania	TWA	DC-3	18	-	-	-	3	-	-	-	15	Subst.		

Encountered severe hailstorm, enroute to Pittsburgh from Reading, resulting in damage to plane. Safe landing made at Harrisburg.

A. Scheduled Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
6/14/48	Yes	Detroit, Michigan	AA	DC-6	23	-	-	-	4	-	-	-	19	Subst.		

The nose gear retracted a few seconds after it contacted the runway and aircraft skidded along on its nose for a considerable distance before coming to a stop. Investigation disclosed the nose wheel gear to be improperly rigged and it appears that the cumulative results of the rigging errors in turn resulted in the down latch being insecure and consequently jarred off center by the effect of nose gear spring-back. The use of insufficiently sturdy templates for precision rigging in the field is also considered as a contributing factor.

6/17/48		Nr. Mt. Carmel, Pennsylvania	UAL	DC-6	43	4	-	-	-	39	-	-	-	Destroyed		Yes

The flight known as 624 was routine from San Diego to a point west of Sunbury, Pennsylvania at which time the New York Radio Operator heard a loud call for New York and a garbled message which indicated that an emergency descent was being made and something was said concerning fire in the forward cargo pit and that a fire extinguisher had been released. No further message was received. Eye witnesses on the ground saw the plane pass over the Sunbury Airport at 400-500 feet. A wide turn to the left was made near Shamokin followed by a wide turn to the right which steepened until the plane struck a ridge and a high voltage transformer station.

6/19/48	Yes	Amarillo, Texas	Pioneer	DC-3C	6	-	-	-	3	-	-	-	3	Subst.		

The flight to Amarillo was normal and routine. After waiting until some thunderstorm activity had passed over the airport, the flight was cleared to make a VFR landing on Runway 31. A normal landing was made, but the plane continued its landing roll and when about 3/4 of the way down the runway, veered off to the right onto the sod, ran through a fence, came to a halt and was the taxied back to discharge the passengers. Investigation revealed that a windshift occurred and this together with the fact that the runway was wet and slippery reduced brake effectiveness and prevented pilot from having full control on the roll.

7/4/48		Washington, D. C.	NWA	Two C-54B's	9	-	-	-	2	-	-	-	7	Subst.		(NC 95407)
			EAL		34	-	-	-	4	-	-	-	30			(NC 88812)

Pilot of NC 95407 was returning to the ramp and was under the impression NC 88812 had already started out from its warm-up position. NC 88812 had not yet moved and consequently pilot in NC 95407 realized too late that he would not have adequate clearance and applied brakes but the left wing tip collided with right tip of NC 88812.

A. Scheduled Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
7/5/48		Minneapolis, Minnesota	Wisconsin Central	Lockheed 10A	11	-	-	-	2	-	-	-	9	Subst.		

While on approach for landing, pilot was unable to get the right gear in full down position and all attempts to retract or fully extend the gear were unsuccessful (it was in half-down position). He then circled in vicinity of airport until fuel was nearly exhausted and made a belly landing in the sod area. Inspection revealed gear malfunction was caused by a pin shearing in the universal joint at the outer gear box. It appears this joint has no provision for lubrication and no cover for protection from grit.

7/12/48		Wenatchee, Washington	NW	Martin 202	17	-	-	-	4	-	-	-	13	Subst.		

While taxying out for take-off, it was discovered that some baggage which should have been deplaned was still on board. A turn around was attempted during which time the nose wheel and right gear were permitted to get off the hard surface taxy way. Pilot applied considerable power in attempting to bring the nose wheel and right gear back on the runway and the nose gear failed allowing the plane to drop down and strike the propellers on the ground.

7/13/48	Yes	Des Moines, Iowa	UAL	DC-3	21	-	-	-	3	-	-	-	18	Subst.		

Enroute from Cedar Rapids to Des Moines, pilot was advised that due to a power failure the field lights at Des Moines were inoperative. However, an emergency generator provided for obstruction lights on the ILS shack and the neon approach lights. Captain contacted the Des Moines tower and was advised of a NE wind 10-15 mph, visibility 3 miles (accident occurred 9 minutes before hours of darkness); he then advised the tower he would land on runway 31. Captain states runway outline was distinguishable during approach, but after passing approach lights visibility was somewhat restricted in light rain. On contact with runway "full" flaps were applied and Captain found brakes ineffective during landing roll on wet runway. Approximately 860 feet from end of 5,700 foot runway the left wheel went off the concrete onto soft sod area and aircraft travelled over the sod 576 feet in a skidding attitude completely demolishing the ILS shack then continued another 185 feet coming to rest against a steel fence.

7/21/48		Ocala, Florida	Florida Airways, Inc.	Beechcraft D18C	3	-	-	-	2	-	-	-	1	Subst.		

While in the traffic pattern for a landing approach at Ocala, a large bird identified as a buzzard, collided with the right wing at a point midway between the right engine and the wing tip. The captain climbed the plane to an altitude of 2,500 feet, checked the stall characteristics and decided to continue to Orlando where fire and crash equipment as well as company shops, were available. A landing was made without incident. Considerable damage was sustained by the wing at the point of impact.

A. Scheduled Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
7/21/48	Yes	Nr. Hutchinson, Kansas	Continental	DC-3	17	-	1	-	2	-	-	-	14	None		

While hostess was carrying out routine duties, the plane encountered a moderate to severe bump causing the hostess to lose her footing and she fell to the cabin floor, suffering injury. She was removed from the plane at Wichita and taken to the hospital where X-ray examination disclosed two broken vertebrae.

8/11/48	Yes	Great Bend, Kansas	Continental	DC-3A	12	-	-	-	3	-	-	-	9	Subst.		

While in flight between Denver, Colorado to Tulsa, Oklahoma, moderate to severe turbulence was encountered near Great Bend, Kansas, following which it was found that elevator control was affected. By the use of maximum power, sufficient control was kept to enable the pilot to effect a safe landing on the Great Bend Army Air Field. Inspection of the plane showed the right horizontal tail surfaces drooped downward from a location near the fuselage attachment. The torque tube of the elevator and the stabilizer had failed from a downward load. No other cause than excessive stresses due to turbulence could be found.

8/19/48		Glenview, Illinois	AA	Convair CV-240	38	-	-	-	3	-	-	-	35	Subst.		

As pilot dropped gear preparatory to landing at Chicago, lights indicated the nose gear remained in retracted position. Repeate attempts were made to lower the nose gear and when it became evident further attempts would be useless, an emergency landing was made at Glenview. A tail-low landing was made, then as speed decreased to 60 mph, the nose slowly dropped and skidded until aircraft came to a stop. Investigation revealed the locating lugs of the upper cam of steering gear centering assembly were sheared. This was followed by displacement of the nose wheel about the steering axis so that it cocked to the left and jammed against the left lower longitudinal nose wheel well beam.

8/29/48		Nr. Winona, Minnesota	Northwest	Martin 202	37	4	-	-	-	33	-	-	-	Destroyed		

During flight through a thunderstorm area, a structural failure originating in the wing panel attachment fitting occurred. The aircraft then broke apart in the air resulting in fatal injury to all on board.

8/29/48	Yes	Spokane, Washington	NWA	Martin 202	31	-	-	-	3	-	-	-	28	Subst.		

Aircraft had just become airborne when the forward cargo door failed and blew off. Pilot immediately reported an emergency and returned to the airport completing the landing without further incident. Considerable damage was sustained by fuselage, center section and horizontal stabilizer.

A. Scheduled Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
8/31/48		Louisville, Kentucky	AA	Convair 240	37	-	-	-	3	-	-	-	34	Subst.		

The plane made a normal landing on the runway but very soon after the nose wheel contacted the surface, the nose wheel gear collapsed allowing the propeller tips, the nose wheel doors and finally the nose to contact the runway. The aircraft veered to the right and came to rest without fire or other complications resulting. Passengers were deplaned safely. Investigator disclosed that the failure in the nose gear was due to a defective brazed joint in the hydraulic retracting cylinder.

9/8/48		Tampa, Florida	NA	DC-4	17	-	-	-	4	-	-	-	13	Subst.	Yes	

Flight 72, Miami to New Orleans via Tampa proceeded routinely until about 57 miles SE of Tampa where a descent was started. At this time it was noted that head temperatures on No. 3 engine were rising with the fuel pressure and oil pressure reading zero. Attempts were made to feather the propeller which were only partially successful. Fire was observed and the firewall shut off valves and right bank of CO_2 was actuated. On the final approach an explosion occurred in the nacelle and parts dropped from the engine. Fire was again apparent and the left bank of CO_2 was discharged. A normal landing was made in spite of a vibration and yaw to the right and the remaining fire extinguished by ground equipment. The origin of the fire in No. 3 nacelle is still being studied.

9/20/48		Burlington, Vermont	Colonial	DC-3	17	-	-	1	2	-	-	2	12	Destroyed		

On a VFR approach the plane was brought in a little high and a little fast. The touchdown was made about half way down the runway. The brakes proved ineffective and it became apparent to the Captain that he would be unable to stop on the runway. He then attempted to take off. Three hundred feet beyond the end of the runway the plane struck a pile of earth followed by contact of the left wing with some saplings, turning the plane 90 degrees to the left and it came to a stop among the trees. Subsequent tests made on the brakes showed them to be in normal condition. There is a strong possibility that the landing was made with the flaps only 1/4 down. It is apparent that the main cause was an approach made too high and with too much speed with a wet runway being a contributing factor. The Captain's delay in applying corrective measures is also a factor.

10/6/48		Chattanooga, Tennessee	Delta	DC-3	10	-	-	-	3	-	-	-	7	Subst.	Yes	

On taking off at Chattanooga and upon becoming airborne, a loud noise was heard and rpm dropped on the right engine, and shortly following a fire was detected in the right engine. Preparations were made to land, including an attempt to feather the engine. After lining up with a runway the gear was lowered. The positive latch had to be forced into position and after the plane landed and stopped rolling, the right gear collapsed. Ground fire equipment extinguished the blaze and all personnel were safely evacuated. Investigation disclosed that the initial cause of the engine failure was a breakage of the wrist pin end of the master rod.

A. Scheduled Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
10/6/48		Chattanooga, Tennessee (Continued)														
		This split the No. 1 piston into two sections. Further disintegration followed tearing off the cylinder and fire followed. The landing gear failure was due, first to the fact that the landing gear was locked down before the gear had fully extended and second, by failure of the truss members to carry the load when the gear knuckled down. This may have been due in part to internal rusting of the truss members.														
10/16/48		Oakland, California	TWA	DC-3	10	-	-	-	3	-	-	-	7	Subst. (NC 18949)		
		Pilot in NC 18949 landed and received tower clearance to taxy in to the ramp. Pilot in NC 2803N meanwhile landed on gravel area (parallel to runway) and without clearance, turned onto the taxy strip ahead of the airliner and proceeded to taxy in. Neither had, at this point, been cautioned by the tower as to their close proximity (tower operators were busy and apparently were not aware of this condition inasmuch as NC 2803N was not given taxy clearance and was expected to hold his position after landing). NC 18949 pilots did not observe the other aircraft and overtook it from the rear.														
10/28/48		Rochester, New York	AA	DC-3	19	-	-	-	3	-	-	-	16	Subst.		
		Following a normal landing the plane was being taxied into the ramp. In making a 90 degree left turn, right brake was applied to halt the turn but the brake failed to hold even though both the Captain and First Officer applied pressure. Power was applied to the left engine without noticeable effect and both brakes were applied but the crew was unable to avoid colliding with two parked Fairchild M-62A's. Investigation disclosed that the hydraulic pressure on right brake was below that required for normal operation. A check of the brake control valves showed the tuning fork to be out of alignment by 3/8 inch. Brake pressures were set for 650 p.s.i. each and taxying tests made which showed brakes to be in normal condition.														
11/6/48	Yes	Dallas, Texas	Delta	DC-3	22	-	-	-	3	-	-	-	19	Subst.		
		On the take-off, airport personnel heard one of the engines cut out as the plane passed the NW boundary of the airport. The engine was feathered and clearance for an emergency landing on runway 7 was requested. On final approach the tower was advised that the landing gear was not locked down. Crash crews were placed in the most advantageous positions. A normal landing was made but after rolling over a third of the runway the aircraft veered to the right, left the runway and groundlooped 180 degrees before coming to rest. Investigation revealed that on the take-off a fine oil mist filled the cockpit covering the instruments and making breathing difficult. The Captain fearing an engine oil leak, feathered the left engine as the leak appeared to be from that source and the landing was made. The actual leak, however, was found to come from a ruptured windshield wiper line which had been installed improperly as a bend had been made in the line too close to the fitting to permit making the required flare in the line inside the fitting. Steps are being taken to prevent a repetition.														

a. Scheduled Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
11/13/48		St. Louis, Missouri	AA	Convair 240	37	-	-	1	2	-	-	2	32	Subst.		

Flight was routine including landing and taxying in at St. Louis. Arriving at the ramp, the engines were cut, parking brakes applied and the cockpit secured. The passenger loading door was then opened, followed almost immediately by the collapse of the landing gear. Investigation disclosed that 3 green lights had shown when gear was extended and pressure was up. However, tests showed that it was possible to move handle to a position 1/2 inch above full down and get the green lights. On landing, friction from the solenoid pin probably held the gear up for a time. Changes are now being incorporated which will make it impossible to get the green lights without the landing gear primary lock being engaged.

11/15/48		E. Boston, Mass.	Northeast	DC-3A	23	-	-	-	3	-	-	-	20	Subst.		

While taxying out from gates, wing struck a passenger loading ramp.

11/19/48	Yes	Birmingham, Alabama	Capital	DC-3	10	-	-	-	4	-	-	-	6	Subst.		

On the landing approach very turbulent air conditions prevailed. On the flare-out, the plane ballooned into the air and would not settle to the runway in the turbulent air. The Captain took over the controls from the co-pilot who was flying and forced the plane on the runway, put the flaps in "up" position and applied brakes. The brakes were ineffective on the wet runway and seeing that the plane would overshoot the runway, the Captain applied full left rudder and full right engine. The plane turned left but did not complete the groundloop before hitting a heavy wire fence along a creek bank. The plane bounced off the fence and headed easterly until one wheel rolled over the bank of the creek at slow speed, bringing the plane to rest.

11/19/48		Endicott, New York	Robinson	DC-3	12	-	-	-	3	-	-	-	9	Subst.		

On a flight originating at Buffalo, New York and with final destination being Bendix Airport, New Jersey, an intermediate stop was made at Tri-Cities Airport, Endicott, New York. On the first approach visual contact was not made at 2,240 feet and the plane was climbed back to 3,500 feet. A second approach was made and this time the contact was made at 2,400 feet and a landing was made in which the plane touched down 1,785 feet from the approach end of the runway following which the plane rolled a distance of 850 feet then started a left turn, rolled off the runway and over a 10 foot embankment, nosing up. Investigation disclosed that the approach and landing was made at a greater than normal speed. This coupled with a wet runway made it impossible to stop within the length of runway remaining.

A. Scheduled Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
11/19/48	Yes	New York, New York	AA	Convair 240	40	-	-	-	3	-	-	-	37	Subst.		

In making a landing approach through heavy rain and turbulent air the crew forgot to place the landing gear in the extended position. As the wheel was eased back and power reduced, the gear warning horn sounded, but both pilots mistook this for the stall warning indicator and applied more power. The plane landed on the belly and skidded along the runway. No fire occurred and all personnel deplaned safely.

11/25/48		Los Angeles, Calif.	TWA	Lockheed 0-49	23	-	-	1	4	-	-	4	14	Destroyed		Yes

Upon arrival at Los Angeles, although the weather was clear, there were patches of ground fog. In the approach as the plane was being flared out, a patch of ground fog was encountered resulting in pilots being "blind". The Captain pulled back on the wheel and the plane dropped in very hard. Both nose wheel tires blew out and other serious damage was sustained. The plane went off the runway and was turned sharp right to avoid a ditch, then came to a stop. Fire ensued and destroyed the plane but not before all occupants were deplaned with only minor injury to five.

12/3/48		Columbus, New Mexico	AA	DC-6	45	-	-	-	4	-	-	-	41	Subst.		

While cruising normally at 18,000 feet, a hard jolt was felt. It was seen that No. 4 engine was missing and fire was in the nacelle. Emergency procedures were followed, the fire extinguished and a safe landing accomplished on the Columbus, New Mexico Airport. The engine was found, practically intact, with one propeller blade missing. This blade was later found and all indications were that it had failed in the air. Tests revealed that the blade failure was due to an original manufacturing defect.

12/8/48		St. Croix, Virgin Islands	Caribbean Atlantic	DC-3	5	-	-	-	3	-	-	-	2	Subst.		

While taxying, left landing gear collapsed as a right turn was made. Investigation showed that the drag strut had failed in upper end attachment bolt. The bolt had seized due to lack of lubrication with the initial failure occurring some time previously.

12/12/48		Yakima, Washington	Northwest	Martin 202	16	-	-	-	3	-	-	-	13	Subst.		

Snow which had fallen on the runways had been inadequately removed and as a result patches of packed snow and ice remained, which were very slippery. On the landing the touchdown was made well within the first 1/3 of the runway. On the last 1/4 of the runway, however, the wheels were observed to be sliding and deceleration had practically ceased. The pilot attempted to groundloop but the plane skidded ahead until the nose wheel struck the packed snow at the end of the runway and collapsed. The plane then skidded on its nose and main wheels in a left turn for 150 feet, coming to rest on its nose and main gear.

A. Scheduled Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
12/21/48		Chicago, Illinois	Capital	DC-3	23	-	-	-	3	-	-	-	20	Subst.		

Pilot of DC-3, taxying out, failed to observe Cessna and taxied into it from the rear.

12/24/48		Nashville, Tennessee	EAL	C-54B	35	-	-	-	5	-	-	-	30	Subst.		

On a flight scheduled between Miami, Florida and St. Louis, Missouri, with intermediate stops at West Palm Beach, Jacksonville, Atlanta and Nashville, the flight was routine to Nashville except for running 1/2 hour late. After some difficulty in contacting the tower on account of precipitation static, the flight was cleared in and advised the tower it was going to land on runway 2 L. When sighted, it was to the right of runway 2 L and the flight advised that it was landing on runway 33. The actual landing, however, was made on runway 2 R, which is short, making contact only 1,500 feet from the approach end. The plane bounced, however, and again made contact 2,100 feet from the approach end. Brakes were applied but were ineffective on the wet, black top runway. The plane went off the runway and came to rest 100 yards beyond with wheels buried in soft dirt. Investigation disclosed poor coordination between Captain and Co-pilot and confusion as to which runway was to be used. Lack of alertness on the Captain's part also played a part.

12/28/48	Yes	Johnson City, Tennessee	Piedmont	DC-3	18	-	-	-	3	-	-	-	15	Subst.	Yes	

Take-off was made from Tri-Cities Airport, an intermediate stop on the route from New Bern, North Carolina to Cincinnati, Ohio. As the plane crossed the airport boundary, the right oil pressure warning light came on and pressure dropped to 40 pounds. A return to the field was made and a landing attempt made on the same runway from which take-off was made. This approach was overshot and throttles were opened for a go-around. Altitude could not be gained and a crash landing was made 3/4 of a mile beyond the airport boundary, with wheels up. Fire started in the left engine but was quickly extinguished by CO_2. Investigation disclosed that the cause of the drop in oil pressure (though not accompanied by power loss) was fuel dilution of the right engine oil, due to a change in the location of the oil dilution switch to one formerly occupied by the primer switch, the crew not having been instructed in such change. In the approach to the emergency landing, the Captain made unnecessary use of the microphones, diverting his attention and he allowed the right engine to overcool by improper use of cowl flaps, resulting in lack of power when it was needed for the go-around.

12/31/48	Yes	Akron, Ohio	EAL	DC-3	18	-	-	-	3	-	-	-	15	Subst.		

Aircraft was in a routine landing approach with gear and flaps down and airspeed 100 mph. At an altitude of about 200 feet, severe turbulence was encountered, and at 150 feet a severe downdraft occurred, which in spite of application of power, dropped the aircraft so close to the ground that the main landing gear struck an embankment just outside the boundary of the airport. The plane bounced into the air for a short distance, landed on the belly and skidded over the icy surface of the runway, finally coming to rest on the left side of the runway.

			Total		1269	15	2	4	165	83	4	16	980			

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A. Scheduled Domestic Operations

2. Other Revenue Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
3/23/48		Pittsburgh, Pennsylvania	All Amer.	Stinson SR10C	2	-	-	-	2	-	-	-	-	Subst.		
				DC-3	8	-	-	-	3	-	-	-	5	(TWA)		

Pilot of All American Stinson was taxying out and watching a TWA ship also taxying to take-off. Pilot failed to observe a standing Douglas DC-3 with engines idling. The right wing passed under the nose of the Douglas breaking pitot mast and continued on into the propeller of the Douglas which was still turning although switches had been cut.

11/28/48	Yes	Albuquerque, New Mexico	TWA	DC-3A	3	-	-	-	3	-	-	-	-	Subst.		

On this flight, carrying cargo only, the weather was CAVU with light turbulence. At 11,000 feet the Captain adjusted his seat so his legs were straight on the rudder and loosened his seat belt. Later the dome light was turned on. Suddenly the aircraft encountered a downdraft which threw the Captain up 4 or 5 inches off his seat where he could not reach the rudder pedals. The aircraft immediately went into a steep dive and right spiral. The aircraft continued down out of control until the combined efforts of Captain and Co-pilot righted it after losing 3,300 feet. A 180 degree turn was made and the plane was headed east. The Captain decided to land at Albuquerque where a landing was made. It was necessary to use brakes and power to keep rolling straight on the runway, but still ran off the right side at the end of the roll. It was then taxied in. Investigation revealed serious damage to the rudder resulting from the excessive stresses applied to it by both pilots. The action of the pilot in not keeping proper adjustment of seat belt and seat is the primary cause coupled with use of dome light instead of rheostat light during flight.

12/26/48		San Juan, Puerto Rico	Caribbean Atlantic	DC-3	2	-	-	-	2	-	-	-	-	Minor		

The pilot of the Aeronca taxied out for take-off and was holding, awaiting clearance from the control tower. While thus standing, a Caribbean Atlantic Airlines Douglas DC-3 taxied along the runway and turned right straight into the Aeronca. Pilot jumped out of his plane in time to avoid other than minor injury. Investigation disclosed the reported facts as substantially correct except that the Aeronca may have been moving forward at the time. The outstanding factor, however, was lack of vigilance on the part of the DC-3's pilot plus the same on part of tower operator.

				Total	15	-	-	-	10	-	-	-	5			

3. Non-revenue Operations

3/9/48		San Francisco, California	UAL	DC-4	3	-	-	-	3	-	-	-	-	Subst.		

Following take-off on a local training flight, it was discovered that the nose gear would not extend, although the main landing gear operated normally. After all efforts to get the gear to lower had been made, the plane was flown to San Francisco Municipal Airport, where after dumping excess fuel and releasing flares, the ship was landed with the nose gear retracted. Investigation disclosed that a long piece from one of the rubber chevron packings in the retracting piston, had become detached and lodged in the orifice of the tee fitting through which the hydraulic fluid for the cylinder passes, where it stayed despite pressures of 4,000 p.s.i. being applied. Changes in this installation in accordance with Douglas Service Bulletin DC-4-78 dated 9/24/47 have been made.

A. Scheduled Domestic Operations

3. Non-Revenue Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
3/18/48		Ardmore, Oklahoma	AA	Convair 240	2	-	-	-	2	-	-	-	-	Subst.		Yes

In practicing a "low visibility approach", a descent was made at 120 mph and at 200 feet a pull-out was started. The airplane struck the ground in approximately level position on all three gears. The center section failed in torsion on both sides and further damage occurred as a result. The teaching of the "low visibility approach" has been discontinued by American Airlines, as this type of maneuver with an aircraft of high wing loading required exact judgment and timing in order to check the rate of descent in sufficient time. A fire which followed the accident was extinguished.

4/2/48		Newark, New Jersey	Northwest	Martin 202	2	-	-	-	2	-	-	-	-	Subst.		

Just as the aircraft left the ground on a ferry flight, the front loading door came off and struck the left propeller. The field was circled and a normal landing made on the airport. Examination indicated that probably on numerous occasions the door had been locked before the rods or "bayonettes" were lined up with the receptacles in the door frame. This caused the rod assemblies to bend or break, and only two of the bayonettes were actually holding the door at the time of the accident. Design on the door could be improved.

5/30/48		Chicago, Illinois	Delta	C-54B	2	-	-	-	2	-	-	-	-	Subst.		

A nose gear failure occurred as pilot swung aircraft to left into position for engine run-up prior to take-off. Investigation disclosed the nose gear yoke end fitting had failed. Evidence indicates faulty manufacture as having contributed to this failure, i.e., imperfect radius and tool marks on highly stressed part.

7/23/48		Los Angeles, California	UAL	C-54	3	-	-	-	3	-	-	-	-	Subst.		

A test hop was being made for the purpose of testing a newly installed No. 1 engine. On the final approach No. 3 engine became rough accompanied by fluctuating manifold pressure indications. The engine was feathered and the landing made but while taxying to the hangar, fire was seen coming from the lower section of ring cowling. The fire was extinguished by use of CO_2 and water. Examination disclosed that fire had apparently originated in the blower section of the engine for reasons not known.

				Total	12	-	-	-	12	-	-	-	-			

4. Non-scheduled Operations (Charter, etc.)

No accidents.

B. Scheduled U. S. Flag International

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury Crew F	Injury Crew S	Injury Crew M	Injury Crew N	Injury Passengers F	Injury Passengers S	Injury Passengers M	Injury Passengers N	Aircraft Damage	Fire In Air	Fire After Impact
2/28/48	Yes	San Francisco, Calif.	PAA	DC-4	34	-	-	-	7	-	-	-	27	Subst.		Yes

While taking off on a scheduled flight from San Francisco to the Orient, after about 2,830 feet down the runway and at an indicated speed of 85-95 mph, all three landing gears suddenly retracted. The throttles were closed and the aircraft skidded along on its belly for 2,450 feet and came to rest, still on the runway. Fire broke out in No. 3 engine nacelle which was successfully extinguished by the use of CO_2 bottles. Extensive investigation was made to determine where the failure may have occurred but nothing was found which could account for it. Suspicion, therefore, rests strongly on the crew and for lack of evidence to prove otherwise, it must be assumed that a member of the crew retracted the gear prematurely on the take-off run.

3/21/48	Yes	Enroute San Francisco - Honolulu	UAL	DC-6	34	-	-	-	6	-	-	-	28	Subst.	Yes	

While cruising at 12,000 feet, No. 4 engine became very rough, although instruments were showing normal indications. Then No. 1 zone fire warning light came on followed by Nos. 2 and 3 zone fire warning lights. The propeller was feathered and the CO_2 selector valve was set for No. 4 engine. CO_2 was not discharged however, as the warning lights went out and a visual check showed the fire had been extinguished. The remainder of the trip was made at 10,000 feet with No. 4 engine feathered. The cause of the trouble was found to be due to the failure of the No. 8 master rod piston pin.

3/24/48		Accra, Gold Coast, Africa	PAA	Lockheed 49	41	-	-	-	10	-	-	-	31	Subst.		

Flight was from La Guardia Field, New York to Johannesburg, South Africa, with six intermediate stops enroute. The flight was routine to Santa Maria where a crew change was made. Upon arrival at Lisbon, some difficulty was experienced in extending the nose wheel gear which was overcome by applying a few strokes to the emergency extension handle. At Dakar the same trouble was again experienced and after landing, an inspection was made. The flight continued, however, and at Accra, the nose wheel again refused to extend and this time all measures taken were of no avail. The aircraft was finally belly landed off the runway without injury to personnel. Investigation disclosed the cause of the trouble to be in the nose gear actuating cylinder. The piston in the cylinder was found to lack the standard 45 degree chamfered edge resulting in the edge being peened over and cutting off chips and scoring the cylinder. Bottoming of the piston against the cylinder and the chips resulted in further peening and chipping until seizure of the piston finally occurred. Steps have been taken to inspect and replace, if necessary, similiar pistons on this type of actuating assembly.

4/15/48	Yes	Shannon, Eire	PAA	Lockheed 49-46	31	10	-	-	-	20	-	1	-	Destroyed		Yes

Pan American flight 1-10 scheduled to fly westward from San Francisco to New York was routine on its trip via Calcutta (where aircraft was changed), Damascus, Syria, Istanbul. On the approach at Brussels, Belguim, the fluorescent lighting on the pilot's side went out. This happened again at London but as no spare rheostat switch, the cause of the trouble, was available, the chart

B. Scheduled U. S. Flag Airlines

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
4/15/48		Shannon, Eire (Continued)														

light was used instead. On the approach to Shannon Airport, using the instrument landing system, one "missed approach" was reported by the flight which was observed by the tower through a break in the clouds. On the second approach the flight reported that it was approaching the marker and then acknowledged a communication from the tower regarding weather. In the approach, however, the flight descended below minimum altitude until it struck the ground 2,380 feet short of the end of the runway. Fire broke out immediately. Investigation failed to disclose any probability of mechanical malfunction other than the possibility of failure of the pilot's fluorescent instrument panel light and it can only be concluded that the probable cause was continuation of the instrument approach to an altitude insufficient to clear the terrain. Failure of the fluorescent instrument light may have been a contributing factor.

4/24/48		St. Louis, Missouri	Chicago and Southern	C-54	51	-	-	-	4	-	-	-	47	Subst.	Yes	

Flight departed Havana, Cuba and proceeded to New Orleans where a crew change was made. On flight to Memphis, No. 3 generator became inoperative and the fire warning light for No. 4 engine came on a time or two, but was disregarded. The generator control box was changed and the flight continued toward St. Louis although the generator was still inoperative. From Memphis to St. Louis, the fire warning signal came on several times, but no action was taken and no examination was made at St. Louis. Seventeen minutes out of St. Louis the oil pressure gauges for Nos. 1 and 2 engines dropped below allowable limits and the flight started a return to St. Louis. The fuel pressure gauge for No. 3 engine rose rapidly and smoke appeared in the cockpit. An emergency landing at Springfield, Illinois was contemplated until the source of the smoke was found to be an overheated transformer in an electrical junction box in the cargo compartment, which burned out and the smoke subsided, leaving fuel oil and manifold pressure gauges inoperative. The flight returned to St. Louis and landed without further incident. It was found on examination that the No. 4 exhaust pipe had parted due to improper installation of the clamp ring. The hot gases had burned through the stainless steel shroud, deflected off the firewall and charred the electric wires in the main electric conduit thus creating a high resistance and overloading the transformer which burned out. Heat from the flame operated the fire detector signal, which was disregarded as crew did not realize that this detector was of a new type, more reliable than an older type previously used. Had the flight continued much further, there is little doubt that a serious fire would have occurred.

4/29/48		San Jose, Costa Rica	PAA	DC-3A	12	-	-	-	3	-	-	-	9	Subst.		

Aircraft was fired upon by riflemen as it was taking off from San Jose. A tire was blown out, several bullets went into or through the cabin and a hole was made in one blade of the No. 2 propeller. No personal injuries were inflicted. It was assumed that the firing was intended for one of the passengers, a Communist leader in Costa Rica but the identity of the assailants could not be determined. Aircraft was not damaged sufficient to affect airworthiness and flight continued to destination.

B. Scheduled U. S. Flag International

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury Crew F	Injury Crew S	Injury Crew M	Injury Crew N	Injury Passengers F	Injury Passengers S	Injury Passengers M	Injury Passengers N	Aircraft Damage	Fire In Air	Fire After Impact
5/17/48		Seattle, Washington	PAA	DC-4	24	-	-	-	7	-	-	-	17	Subst.		

While taxiing in to the ramp, a small customs building was passed. A ramp crew signalman was in attendance and directed the pilot to continue to taxy. Just before coming to rest at the blocks, the left wing tip struck a smokestack on top of the building, crushing the leading edge of the wing. Approaching darkness and inadequate lighting on the building were factors as well as poor coordination between the Captain and ramp signalman.

5/27/48	Yes	Tamuin, Mexico	AA	DC-6	21	-	-	-	4	-	-	-	17	Subst.	Yes	

Flight 90, Los Angeles to Mexico City, Mexico, made a routine flight as far as Monterrey, Mexico after a stop at El Paso, Texas. After departing Monterrey and reaching 10,000 feet, Nos. 1, 2 and 3 engines were shifted to high blower. No. 4 high blower was placarded "inoperative" and was not used. At 18,000 feet, Nos. 1 and 4 engines were changed to the alternate tanks with propellers at fixed position. Shortly thereafter No. 2 engine surged to a very high rpm accompanied by a loud explosion and fire around the nacelle. Fire warning lights came on, indicating fire in zones 1, 2 and 3 of No. 2 engine. No. 2 propeller was immediately feathered, the oil and fuel selector valves shut off and the left bank of CO_2 discharged. The fire went out. The Captain then decided to land at Tamuin and make an instrument approach. The flight broke out at 1,300 feet and a landing was made in which the pilot could not stop the aircraft until within 400 feet of the end of the runway where a 90 degree left turn was made causing three tires to blow out. Tests conducted on overspeeding have established that by following certain procedures in the engine operation, overspeeding may be avoided. Further research and testing is being done with a view to elimination of this troublesome problem.

7/24/48	Yes	Havana, Cuba	PAA	Convair 240	44	-	-	-	4	-	-	-	40	Subst.		

A normal landing was made with all indicators showing gear down and locked. However, during the landing roll the nose gear partially retracted and aircraft skidded on the nose until brought to a stop. Investigation disclosed the failure of a defective brazed joint in the nose wheel retracting cylinder which allowed nose gear to retract.

12/9/48		Havana, Cuba	PAA	Convair 240	44	-	-	1	3	-	-	-	40	Subst.		Yes

On the take-off run, approximately 2,500 feet was used up without the plane becoming airborne. The Captain reduced power and applied brakes without effect. The plane continued off the end of the runway, struck a ditch shearing off left main gear, nose gear and right wing and engine, and came to rest on its belly. The right wing and engine which had separated completely from the plane caught on fire. Investigation revealed that an unidentified vibration had occurred on the take-off. The Captain was tardy in discontinuing the run resulting in brakes being applied while aircraft was nearly airborne. This wore through two of the aircraft's main tires and braking action on the remaining two was insufficient to stop the plane. A contributing factor is believed

B. Scheduled U. S. Flag International

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire In Air	Fire After Impact
2/9/48		Havana, Cuba (Continued)														

to be engine malfunctioning and vibration during take-off due to failure of the water injection regulator vent line check valve to function resulting in upsetting the mixture.

2/13/48		New Orleans, Louisiana	Chicago and Southern	C-54B	9	-	-	-	4	-	-	-	5	Subst.		

After effecting a normal ILS approach and landing, and following a short roll, the nose of the plane started to drop. The horn started blowing and the red light came on. After losing speed, the nose contacted the runway and the plane skidded along for 1,800 feet coming to rest on the nose and wheels. Investigation disclosed that the retraction of the gear was due to the failure of the First Officer to place the landing gear handle in the full down and locked position, possibly due to confusing the handle with the flap control handle.

				Total	345	10	-	1	52	20	-	1	261			

2. Other Revenue Operations

No accidents.

3. Non-revenue Operations (Test, Ferrying, Training, Check, Publicity, Familiarization, Company Flights, etc.)

1/27/48		Miami, Florida	PAA	C-54B	3	-	-	-	3	-	-	-	-	Subst.		

While taxying out for take-off on a pilot training flight, a normal right turn onto the runway was started at which time several loud sharp reports were heard from the direction of the nose wheel assembly. The rate of turn sharply increased and the nose wheel collapsed to the left. Investigation disclosed that the cause was the failure of the right nose gear yoke end fitting. It is considered likely that the strength of the subject type fittings is marginal.

5/8/48	Yes	New York, New York	PAA	Lockheed 49	4	-	-	1	3	-	-	-	-	Subst.		

During a test flight, fumes and the odor of burning material were noticed. Heater inverters and generators were turned off and the tower was notified that an emergency landing would be made on the airport. A straight in approach and landing on runway 31 was approved. Landing check off was completed and plane touched down between 110 and 120 mph. Propellers were reversed and the aircraft veered to the right. Pilot was unable to stop this turn with left brake and the plane left the runway, catapulted an embankment, went into the Bay and came to rest about 50 feet beyond embankment, partially submerged in the water. Investigation disclosed that failure occurred in the electrical power source resulting in only two propellers reversing. Loss of directional control occurred primarily as a result of the pilot's failure to have all three gears on the ground in the landing roll. During

B. Scheduled U. S. Flag International

3. Non-revenue Operations (Test, Ferrying, Training, Check, Publicity, Familiarization, Company Flights, etc.)

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury Crew F	Injury Crew S	Injury Crew M	Injury Crew N	Injury Passengers F	Injury Passengers S	Injury Passengers M	Injury Passengers N	Aircraft Damage	Fire In Air	Fire After Impact
5/8/48		New York, New York (Continued)														
		the roll the left outboard tire of the left main gear blew out. The smoke and fumes were found to be due to failure of the gyro instrument transformer which supplies power to the gyro instruments. Corrective measures were instituted as a result of this accident.														
10/27/48		Nr. Edmonton, Alberta, Canada	Northwest	DC-4	5	2	2	1	-	-	-	-	-	Destroyed		Yes
		The flight departed Edmonton, Alberta, Canada where a stop had been made on a ferry flight to Tokyo, Japan from Minneapolis. No radio contacts were made after take-off and it was later determined that the plane had crashed and burned 10 minutes after take-off at a point 35 miles NW of Edmonton. Investigation indicated that the plane had been flying very low and had struck a tree 3,000 feet east of the final stopping point. It also indicated the probability that the Captain was giving instruction to the Co-pilot with one and two engines feathered and allowed the plane to descend to such a point that it was too late to avoid the tree														

4. Non-scheduled Operations (Charter, etc.)

3/12/48	Yes	Mt. Sanford, Alaska	Northwest	DC-4	30	6	-	-	-	24	-	-	-	Destroyed		Yes
		As part of a charter flight from Shanghai, China to New York, take-off was made from Anchorage, Alaska. Position reports were made over the Wasilla intersection at Sheep Mountain and Gulkana. From here a direct course was set for Snag, Yukon. On this course, 42 miles from Gulkana, is Mt. Sanford, 16,208 feet elevation. No further communication was heard from the flight and a fire was reported on Mt. Sanford. Search finally located the wreckage on the west slope of the mountain at an elevation of 8,500 feet. Investigation disclosed that ordinarily under good visibility conditions, Mt. Sanford could easily be seen and skirted, but on this occasion the aurora borealis was particularly brilliant and it is thought probable that a thin layer of clouds capping the mountain may have acted as a reflector for the lights and thus obscured the crew's view of the mountain until too late to avoid crashing into it.														
				Total	42	8	2	2	6	24	-	-	-			

C. Irregular Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
1/7/48		Savannah, Georgia	Coastal Air Lines	DC-3	27	1	1	-	-	17	8	-	-	Destroyed		

Enroute, between Charleston and Savannah, on a flight from Newark, New Jersey to Miami, Florida, the Co-pilot left the cockpit for navigation charts and while in the cabin heard one or both engines run roughly. By the time he returned to his seat, they were operating normally but a few minutes later both engines stopped and the fuel pressure gauges were seen to read zero and pressure could not be restored with the wobble pump, placing of crossfeed valves in "on" position, or changing of fuel selector valves. When it became apparent that the engines could not be started, the Captain instructed the Co-pilot to proceed to the passenger cabin to see that their safety belts were fastened, in preparation for a landing in a marsh. While thus engaged, he felt the airplane turn steeply and he started back to the cockpit but was forced to the floor by centrifugal force. The aircraft shuddered as though in a stall and crashed. Investigation failed to disclose definite evidence of malfunction other than the strong probability that the fuel selector valves were positioned so that both engines were supplied fuel from only one of the auxilliary tanks until fuel was exhausted, then if the crossfeed valve was placed in the "on" position, air would enter the system and result in inability to restart the engines, bringing on the forced landing in which the pilot, unassisted, lost control of the plane and allowed it to stall.

1/28/48		Coalinga, California	Airline Transport Carriers	DC-3C	32	3	-	-	-	29	-	-	-	Destroyed	Yes	

The crew scheduled to use NC 79055, certificated for 32 passengers, made a mistake and took NC 36480, certificated for 26 passengers, and which was 7 hours overdue for a 100 hour inspection. The flight to Oakland was routine but here 28 Mexican Nationals were enplaned, leaving three sitting on luggage without safety belts. While cruising south at 5,000 feet, smoke was observed streaming from the left engine, followed about a minute later by flames. A dull explosion was heard after which the left wing and left engine dropped free of the aircraft which then crashed out of control. Investigation disclosed that the gasket in the engine driven left fuel pump was broken and the four studs holding the castings of the pump together were loose. Tests showed that under pressure, gasoline would spray from the pump. This spray probably became ignited from the exhaust and the intense fire thus generated burned through the main spar back of the left engine.

2/2/48		Lanai, T. H.	Andrew Flying Service, Ltd.	Cessna C-78	2	-	-	-	1	-	-	-	1	Subst.		

In landing approach apparently pilot failed to maintain sufficient airspeed and when a downdraft was encountered, ship stalled out and struck ground hard.

C. Irregular Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
2/3/48		San Juan, Puerto Rico	Argonaut Airways	DC-3C	2	-	-	-	2	-	-	-	-	Subst.		

On the level-off for the landing a sudden deluge of rain came down reducing visibility to zero. Turning on the windshield wipers failed to improve matters. The ship stalled and touched the right wing tip and end of the right aileron on the runway. The rain stopped immediately and the pilot was able to straighten the ship up and continue on down the runway without further difficulty.

3/29/48	Yes	Mana Kauai, Hawaii	Cockett Airlines	Beechcraft C-18S	1	-	-	-	1	-	-	-	-	Subst.		

On the landing roll the right wheel locked due to the shearing of a special hex head bolt from the brake drum. Right tire blew out and plane skidded to a stop on the propeller hubs and nose section.

4/24/48	Yes	Annette Island, Alaska	Arctic-Pacific	Curtiss C-46D	7	-	-	-	4	-	-	-	3	Subst.		

The president of Arctic-Pacific, Inc. was acting as co-pilot in the right side while Pilot Bredehoft was acting captain, although apparently not in actual command of the plane. The approach was made too high. The acting Co-pilot applied power but the Captain was apparently so sure that he could make the landing that he cut the power off by pulling back the throttles and pulled back on the control wheel. The tail went down almost 60 degrees without touching and the aircraft stalled violently. Some recovery was effected by use of power but damage occurred as the ship dropped in hard. Glare from field lights may have been a contributing factor.

4/26/48		Potts Camp, Mississippi	Southern Airways	Beechcraft 35	4	-	-	-	1	-	-	-	3	Subst.		

On a charter flight from Memphis, Tennessee to Columbus, Mississippi, failure of the engine occurred while cruising. The plane was landed wheels up in an open field with no injury to occupants resulting. The engine was shipped to the Continental Factory without ascertaining the exact cause of the failure but the evidence indicated strongly that the trouble was in the lubrication system.

6/3/48	Yes	El Morro, New Mexico	Aero-Van Express Corp.	DC-3C	31	-	-	-	3	-	-	-	28	Destroyed		

While in normal cruise, pilot detected a vibration in the aircraft and suspecting icing, applied carburetor heat which only tended to increase the vibration. He then identified the left engine as the offender and immediately feathered the propeller and initiated single engine procedure making a VFR approach to a nearby auxiliary airport. Pilot overshot the runway on his first attempt to land and elected to make a 90 degree right turn crossing the head of the runway then another 270 degree right turn thus lining up on the runway for final approach. While executing this maneuver, pilot undershot and was unable to maintain sufficient altitude

C. Irregular Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
6/3/48		El Morro, New Mexico (Continued)														

on the single engine to reach the runway - aircraft continued to settle in despite full power on the one engine and contacted rough terrain with the wheels retracted and in level flight attitude. Aircraft skidded a considerable distance, turned and skidded sideways before coming to rest. Investigation revealed the following facts: (1) The No. 12 cylinder of left engine had broken off at the No. 4 and No. 5 fin, but did not swallow the valve. The rear spark plug was dirty with carbon and apparently not delivering full fire power. Examination of the cylinder head showed signs of scorching and overheating. Since an explosion occurred immediately after carburetor heat was applied, indications are, a detonation condition existed in the No. 12 cylinder and the application of heat intensified the detonation which blew off the cylinder head; (2) Aircraft was overloaded on take-off and also during landing; (3) Generally poor maintenance was indicated in that aircraft and engines were dirty; and (4) Pilot did not use the let-down procedure for the airport being used - the field was lighted and radio station was operating.

6/20/48		Big Delta, Alaska	Arctic Frontier Airways	DC-3A	23	-	-	-	2	-	-	2	19	Subst.		

The flight had departed from Juneau, an intermediate stop on an instrument flight plan, for Fairbanks. In the vicinity of Big Delta while on instruments, the pilot saw a mountain directly ahead. A steep pull-up was made and a crash was heard. The aircraft was climbed to 9,000 feet, flown to Fairbanks and safely landed. It was found that one blade tip of a propeller was bent and the tail wheel strut was also bent causing considerable damage to the fuselage bulkheads. Some damage in the cabin also occurred due to a sudden forward leveling off with some passenger's seat belts not being fastened. Investigation disclosed no malfunction of plane or radio range facilities which could have contributed to the accident and it is concluded that navigational pilot error was the primary cause.

9/21/48		Everett, Washington	Golden North Airways	Curtiss C-46A	10	-	-	-	3	-	-	-	7	Subst.		

The right propeller governor was out and rpm was being controlled by use of the manual control. However, the manual control also malfunctioned and being in the vicinity of Everett (where pilot knew C-46 maintenance was available) pilot elected to land rather than continue through bad weather on to Seattle. Pilot made a straight in approach on a crosswind runway touching down at approximately the halfway point. Aircraft ran off the runway and pilot groundlooped to avoid running off a 15 foot drop. The tail dropped over the edge of this bank and struck a tree. Runway was wet from a recent rain.

9/29/48	Yes	Cordova, Alaska	Trans-Alaskan Airlines	DC-3C	10	-	1	1	-	-	3	5	-	Subst.		

A landing was made in heavy rain with excess speed. It became apparent to the pilot that he would be unable to stop within the remaining runway and he attempted to groundloop but was only partially successful. The aircraft went into a deep ditch at a speed of approximately 30 mph. Investigation disclosed that the aircraft had been landed partly downwind in an 18 mph wind, the

C. Irregular Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
9/29/48		Cordova, Alaska (Continued)														

resultant "assist" being in the neighborhood of 11 mph. Weather sequence reports received in flight indicated an easterly surface wind and although it was actually ENE at the time of approach, the landing was made to the west. There is a possibility that the landing was made downwind purposely as the approach from the east is much clearer and the pilot was not very familiar with the surrounding terrain.

10/4/48	Yes	Haines Cay, Bahama Is., Berry Is. Group	New England Air Express	DC-3	23	-	-	-	4	-	-	-	19	Destroyed		

The flight departed Teterboro, New Jersey on a direct flight to Miami, an intermediate stop before San Juan, Puerto Rico. The U. S. coast was left at about Atlantic City and was not sighted again thereafter. Cross checks were made on the Washington, D. C.; Cherry Point, North Carolina; and Charleston, South Carolina ranges. After crossing the Melbourne, Florida range, it was expected that the mainland would be sighted, but failing to do so the flight was headed west. Lights were sighted which proved to be a large island. Tuned in Nassau range, picked up a leg and was following it in when fuel in right main tank became exhausted. Switched to left main and found that only 30 gallons remained, insufficient to reach Nassau. Islands were sighted which were identified as the Berry Group and a landing, wheels-up was made on the beach with only minor damage resulting. The surf later damaged the plane beyond repair. Though there is no factual evidence to support it, a probability exists that the crew were asleep during part of the flight and the auto pilot precessed and turned the plane leftward.

10/19/48		Anchorage, Alaska	Columbia Air Cargo, Inc.	DC-3	5	-	-	-	3	-	-	-	2	Subst.		

On a flight from Portland, Oregon, an intermediate stop was made at Annette Airport where fuel was taken on and some cargo unloaded. The flight continued using the original weight and balance sheet. At Anchorage, 505 pounds of cargo was unloaded and the aircraft refueled to 600 gallons. After about three hours on the ground here, a take-off was attempted after brushing off accumulated snow on the wings with brooms. On this take-off it was seen that the plane used up the entire 3,960 foot runway, becoming airborne to about 10 feet after leaving the hard surfaced area. The plane banked to the left about 30 degrees and dragged through a copse of small trees and brush. Unable to gain altitude, a landing was made in the brush. Investigation disclosed that the cargo on board plus fuel and two passengers with baggage aggregated gross load of 27,403 pounds. Although the c. g. was still within limits, the cargo exceeded by 2,076 pounds, the amount listed on the balance form. The cargo was inadequately secured and had shifted somewhat. Further, it was found that the snow had not been completely cleared from the wings before take-off. This was the pilot's first trip as Captain.

C. Irregular Domestic Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
10/23/48	Yes	Teterboro, New Jersey	Modern Air Transport	Two DC-3's	23	-	-	-	2	-	-	-	21	Subst.		

When gear was placed in down position, it was noticed that there was no hydraulic pressure. Gear was secured and locked in down position and landing made. Safety pins were placed in the gear to taxy in and brake pressure was maintained by manual operation of hydraulic emergency pumps. As the ramp was approached, both brakes failed to operate despite use of the hydraulic emergency pump. Unable to stop, a collision ensued with a parked American Air Transport DC-3. The plane was finally stopped by heading into the wind on the ramp apron away from other airplanes and buildings. It was found that the failure of the brakes were due to to complete loss of all hydraulic fluid through a break in one of the left engine hydraulic lines.

11/4/48		Nr. Cape Spencer, Alaska	Pacific Alaska Air Express	DC-3C	17	2	-	-	-	15	-	-	-	Destroyed		

The flight departed Yakutat, Alaska for Annette, Alaska as one leg of an Anchorage-Seattle trip. A position report was received by the Gustavus Radio that the flight had passed Cape Spencer and was estimating being over Sitka at 1544. Nothing further was heard from the flight and an extensive search failed to locate it.

12/28/48	Yes	Between San Juan, P.R. and Miami, Florida	Airborne Transport, Inc.	DC-3	32	3	-	-	-	29	-	-	-	Destroyed		

Although some trouble was present in the electrical system and the batteries were nearly discharged, the plane was cleared for the return trip of a round trip flight from Miami to San Juan providing contact with the tower could be made after take-off for purpose of filing an IFR plan. This was not done. However, the flight proceeded toward Miami without a clearance and overloaded by 118 pounds. Further contact with the plane could not be made by San Juan. Contact, however, was made with Miami, the flight reporting it was cruising at 8,500 feet. New Orleans intercepted a message from the plane later stating it was 50 miles south of Miami. Nothing further was heard from the flight and a search failed to locate it. Investigation showed that the most probable cause of the plane's disappearance was a navigational error by which the pilot believed the flight to be east of the Florida Peninsula whereas it had actually crossed the Keys and was west of the peninsula. He was unable to make radio contacts due to electrical trouble and discharged batteries and so flew west over the Gulf of Mexico until land could not be reached before the fuel was exhausted. A northeast wind was a factor in this.

10-12-48		Annette Island, Alaska	Arnold Air Service	DC-3	8	-	-	-	2	-	1[a]	-	6	Minor		

Plane was being taxied on the side of the runway with the wing overhanging a nearby gravel road which ran parallel to the runway. A road grader operated by a CAA employee was being driven on the gravel road in the same direction the airplane was moving. The right wing of the aircraft collided with the grader cab knocking it off the grader and injuring its driver. The pilot states that the tail wheel was in locked position because of gusty conditions and he was unable to unlock it in time to avoid the grader

				Total	257	9	2	1	28	90	11	7	109			

a/ Bystander seriously injured not counted in totals.

C. Irregular Domestic Operations

2. Other Revenue Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury Crew F	Injury Crew S	Injury Crew M	Injury Crew N	Injury Passengers F	Injury Passengers S	Injury Passengers M	Injury Passengers N	Aircraft Damage	Fire In Air	Fire After Impact
2/25/48	Yes	Columbus, Ohio	Bruning Aviation, Inc.	DC-3	2	1	1	-	-	-	-	-	-	Destroyed		Yes

Flight was enroute from Pittsburgh to Columbus on instrument clearance. The Co-pilot flew until the instrument approach was started at which time the Captain took over. The flight was cleared to the Hilliard fan marker located 9.8 miles west of the Columbus Radio Range Station. The last communication from the flight was received when it was 23 miles east of the airport at 2,600 feet. When the Captain took over the controls, he descended to 1,600 feet, the minimum for that part of the instrument approach to Columbus. He continued to let down below this altitude although the Co-pilot remonstrated with him. The descent was continued until trees were observed, into which the aircraft flew and after striking several, crashed and burned 1,150 feet from the first point of impact. Death resulted to the pilot but the co-pilot escaped with serious injuries. The point at which the impact occurred was 1,140 feet elevation.

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury Crew F	Injury Crew S	Injury Crew M	Injury Crew N	Injury Passengers F	Injury Passengers S	Injury Passengers M	Injury Passengers N	Aircraft Damage	Fire In Air	Fire After Impact
3/2/48		Newark, New Jersey	Meteor Air Transport	DC-3	2	-	-	-	2	-	-	-	-	Subst.		

Enroute Detroit to Newark, the aircraft was exposed to icing conditions for approximately forty minutes. Newark was contacted for an emergency landing, which was approved. After one approach was missed, a "missed approach" procedure was applied and a second approach made. This time, visual contact was made and the aircraft approached runway 6. As it passed over the approach lights, the plane stalled, shearing off the light supports and the right wing of the aircraft. The plane continued on in flight attitude, bounced onto the end of the runway, continued down the runway under control and was taxied in to a parking area.

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury Crew F	Injury Crew S	Injury Crew M	Injury Crew N	Injury Passengers F	Injury Passengers S	Injury Passengers M	Injury Passengers N	Aircraft Damage	Fire In Air	Fire After Impact
3/23/48		Santa Maria, California	Flying Tiger Line, Inc.	C-54	2	-	-	-	2	-	-	-	-	Subst.		

After taxying into position for an engine run-up before take-off, the runway surface suddenly gave way under the left wheel allowing the propeller tips to strike the ground. The master switch and idle cut off were immediately used, preventing further damage. A ditch running across one end of the runway was apparently improperly filled and improperly covered. Recent rains had undermined the runway.

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury Crew F	Injury Crew S	Injury Crew M	Injury Crew N	Injury Passengers F	Injury Passengers S	Injury Passengers M	Injury Passengers N	Aircraft Damage	Fire In Air	Fire After Impact
4/7/48	Yes	Miami, Florida	Continental Charters	DC-3	2	-	-	-	2	-	-	-	-	Subst.		

While running up engines, the left magneto was out on the right engine although right magneto was okay. A recheck on the left magneto gave a bad backfire and fire broke out in the engine. The CO_2 bottles and plane extinguisher were of no avail and the fire was finally extinguished by an Army Jeep equipped with a large bottle, and the fire department. Investigation disclosed the probability that during the actuation of the inverter switch the carburetor de-icing switch had been inadvertently contacted and discharged a certain amount of de-icer fluid into the air scoop. This, combined with the severe backfire, may have caused the fire. The Co-pilot recalls having turned on the inverter switch.

C. Irregular Domestic Operations

2. Other Revenue Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
4/28/48	Yes	Burbank, California	Flying Tiger Line, Inc.	DC-3C	2	-	-	-	2	-	-	-	-	Subst.		

A normal take-off was made on runway 15. After becoming airborne and at about 50 feet altitude, the plane started a gentle turn to the left which the Captain corrected by control action and by retarding the right throttle, this resulting in the ship reversing and entering a steep right bank and turn. All power was reduced as the Captain attempted to roll out of the steep turn. The right wing tip and right landing wheel struck the ground. Control was finally regained, however, and the airplane rolled to a stop without further damage. Immediately after this, the wing de-icer boots were found to be operating. The left engine was run up and it was found that there was definite loss of power. The removal of the electrical harness revealed an excessive amount of water due to flying through rain previously. Correction of this condition resulted in normal operation. The Captain had been flying heavier equipment and stated that he possibly had not attained the necessary safe airspeed as he had not flown this type for over a month.

5/4/48		Chicago, Illinois	Flying Tiger Line, Inc.	C-54	2	-	-	-	2	-	-	-	-	Subst.		

Upon arrival at Chicago from St. Louis, the flight was cleared to make an ILS approach. It missed the approach and with tower approval, made two circling approaches, the last one to runway 18R on which it landed. The plane, however, failed to decelerate normally and continued on off the end of the runway where it swerved to avoid a concrete abutment, narrowly missing a parked DC-4 with its right wing. The right flap struck the top of a parked truck and the nose gear failed on striking a slightly raised gravel area. Investigation failed to disclose any mechanical malfunction and it is evident that under the conditions of reduced visibility and a wet runway that the Captain made his touchdown so far into the runway (1/4 of the way) and with such speed that stopping within the limits of the runway was not possible.

5/16/48	Yes	Columbus, Ohio	Slick Airways	Curtiss C-46E	2	2	-	-	-	-	-	-	-	Destroyed		Yes

Enroute from Newark to Chicago the flight requested cancellation of its instrument clearance and proceeded to Columbus, Ohio to land. There they reported that they were experiencing trouble with controls and after missing two approaches, stalled on a go-around, crashed and burned. Investigation indicates that as a probable result of being flown through an area of very severe turbulence, one half hour before the accident, the rivets and fuselage skin immediately beneath the vertical fin failed, allowing the fin to rock across its longitudinal axis until the fuselage carry-in structure beneath the fin failed completely, causing complete loss of control. All models of this aircraft, following recommendation of the manufacturer, are to be reinforced around the skin and fuselage semi-bulkhead frames beneath the vertical fin.

C. Irregular Domestic Operations

2. Other Revenue Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
6/12/48	Yes	Eloy, Arizona	Eagle Air Freight	DC-3C	2	-	-	-	2	-	-	-	-	Destroyed	Yes	

While in flight enroute from Burbank, California to El Paso, Texas, fire broke out in the left engine. The fuel flow was cut, CO_2 discharged and the propeller feathered. It was first decided to attempt a landing at Tucson after smoke which had filled the cockpit had cleared and recovery had been made from an uncontrolled spiral which had occurred when power on the right engine was reduced. However, since the left engine had fallen from the plane, right wing heaviness became more pronounced as an attempt was made to maneuver the plane into position for a landing. It was then decided to land at Eloy, Arizona which has a private airport. However, the actual landing was made in a stubble field and the crew escaped through the cockpit hatch. The missing engine has never been found although an intensive search was made and the definite cause of the fire cannot be established. The maintenance of the air carrier was found to be below reasonable safety standards for this type of operation. Contributing factors were; the fact that the Captain was asleep at the time of the fire discovery and failed to follow correct emergency procedures.

6/16/48		Dallas, Texas	Slick Airways, Inc.	Curtiss C-46E	4	-	-	-	2	-	-	-	2	Subst.		

Shortly after refueling the aircraft, an attempt was made to start the engines. The right engine backfired (the exhaust consisting of a large ball of flame) and was immediately followed by an explosion within the right wing. The expansion which resulted from ballooning effect of explosion raised leading edge skin from the ribs and was sufficient to cause the collapse of nose ribs throughout the wing with exception of wing tip - fuel tank was not damaged. Investigation revealed fuel leakage at filler neck base, which was loose where fastened to the right tank, which would permit gasoline to drip into leading edge of outer wing panel and into lower portion of fairing where attached to center section. Evidence indicates explosion resulted when exhaust fire came near fuel dripping out of the fairing.

7/15/48		Seattle, Washington	Eagle Air Freight	DC-3	2	-	-	-	2	-	-	-	-	Subst.		

Shortly after take-off, pilot noted failure of right gear to retract and several unsuccessful attempts were made to get it up. He returned to the airport and landed, after having placed gear handle in down position and holding all pressure possible on the gear. Aircraft was nearing end of landing roll when the right gear collapsed and aircraft made a 180 degree mild groundloop. It appears that gear malfunction was due to failure of hydraulic landing gear retracting strut.

12/31/48		Cleveland, Ohio	Air Cargo Express	DC-3C	2	-	-	-	2	-	-	-	-	Subst.		

On the take-off climb and at an altitude of 30-40 feet, the left engine began malfunctioning. Fuel pressure fell off to 4 pounds and would not come up despite operation of the wobble pump. Left propeller was feathered and a shallow left turn started in an attempt to line up with a runway. In this turn, which was made toward the dead engine, the plane rapidly lost altitude until it struck the ground on the left wing. The plane then slid over the ground finally coming to rest inside the boundary of the airport. Investigation disclosed that the main fuel strainer of the left engine was full of solid ice, as well as the fuel line from the wobble pump to the inlet of the strainer. Also some accumulation of ice was found on the leading edges of the wings and a considerable accumulation on the leading edges of the horizontal stabilizers. The cross-feed was not used on the take-off.

			Total		24	3	1	-	18	-	-	-	2			

C. Irregular Domestic Operations

3. Non-revenue Operations (Test, Ferrying, Training, Check, Publicity, Familiarization, Company Flights, etc.)

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
1/19/48	Yes	Madison, Wisconsin	Wisconsin Central Airlines	Lockheed 10A	2	-	-	-	2	-	-	-	-	Subst.		

While making a landing during transition training, contact was made normally 200 feet from end of runway but the ship gradually veered to the left. Control was regained with left throttle and right brake, but a slight jar was felt and after getting stopped, an examination showed that left lower fin had been damaged probably from contact with a snowbank. Wind was 10 mph and 20 degrees off runway from the left.

3/8/48		Mt. Hamilton, California	Eagle Air Freight	DC-3C	2	2	-	-	-	-	-	-	-	Destroyed		Yes

After being cleared for a straight in approach the flight reported leaving the Moffet Radio Range Station and 4,000 feet. No further contact was made. The wreckage was discovered in a canyon on the west side of Mt. Hamilton. Investigation disclosed no indication of fire or malfunction in the air. It did indicate, however, that the crew had deviated from their clearance and approved instrument procedure. It is possible that they were attempting to descend through a break in the overcast, but the flight path from Moffet to the scene of the accident cannot be determined.

8/9/48	Yes	Pohakuloa, Hilo, Hawaii	Cockett Air-lines	Beechcraft C-18S	1	-	1	-	-	-	-	-	-	Destroyed		Yes

Pilot took off from Hilo on return flight to Honolulu - his VFR flight plan estimating elapsed time enroute of one hour, thirty minutes with available fuel supply as three hours. Upon reaching the north shore of Island of Hawaii, he positioned himself near Upolu Point by lights on the ground and shifted his radio receiver to Maui Radio Range and picked up the range signals. Shortly thereafter the radio became erratic and his efforts to contact Maui Radio were unsuccessful. Pilot flew around for forty minutes in an attempt to find either the Island of Maui or Kahoolawe - steering various headings - and being unable to find either island reversed his heading, planning a reciprocal course back to Hilo. Back over the Island of Hawaii, pilot recognized two mountains and positioned himself on the saddle between them thus establishing the shortest distance to Hilo, as one tank was empty and the fuel low in the other. The engines suddenly lost power and being unable to revive them, a wheels-up landing was made on a rough lava bed. Aircraft was demolished, as it skidded over the rough lava, and the entire forward section, back as far as passenger's cabin door, was consumed by fire. From available evidence it is believed pilot had been lost and while returning to point of take-off the engines cut out due to fuel exhaustion.

9/20/48	Yes	Miami, Florida	American Air Export & Import Co.	DC-3C	3	-	-	-	1	-	-	-	2	Subst.		

The left gear collapsed during take-off run quickly followed by the right gear and investigation failed to reveal any cause for malfunction or failure of the landing gear. It appears pilot had attempted to raise the gear prematurely.

C. Irregular Domestic Operations

3. Non-revenue Operations (Test, Ferrying, Training, Check, Publicity, Familiarization, Company Flights, etc.)

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
9/27/48		Miami, Florida	Nationwide Air Transport Service	DC-3A	2	-	-	-	2	-	-	-	-	Subst.	Yes	

Pilot returned to airport after the right engine began to run rough and backfire. Coming in on final approach, fire was observed in the left engine; pilot completed the landing and upon turning off runway discharged the CO_2 in that engine, which together with aid of airport crash crew, extinguished the fire in two minutes. Later, inspection disclosed a loose, improperly connected fuel pump hose connection. Fuel had escaped into the lower section of engine nacelle and had apparently been ignited by engine exhaust torching as power was reduced during landing.

10/14/48		Miami, Florida	Inter-American Airways	Lockheed 18-50	3	-	-	-	2	-	-	-	1	Subst.		

The plane was being flown on a test flight following rewiring of the ignition harness on both engines. Shortly after take-off, at an altitude of 1,000 feet, the right engine suddenly failed, followed by the left engine. An emergency landing was at once made on the Miami Navy Master Airport. During the landing roll the right landing gear collapsed and the right wing settled to the runway. Investigation disclosed that the right gear down latch had failed to engage although the left gear and wing flaps were in the full down position. Further investigation disclosed that the cause of engine failure was water in the fuel system of the plane, possibly placed there by a disgruntled former employee, although definite proof of this could not be established. The failure of the right gear to engage is believed to be due to the inadequate capacity of the hydraulic system accumulator with which this type is equipped, when both gear and flaps are extended simultaneously.

12/13/48		New Milford, New Jersey	Arrow Airways	DC-3	2	-	-	-	2	-	-	-	-	Subst.		

During the course of a six month proficiency check for the Captain, and while in a steep bank to the left, the airplane suddenly assumed an extreme nose down attitude, accompanied with violent vibration. Control was difficult to maintain. A wheels-up emergency landing was made in a weeded field. Examination disclosed that the rear cargo door had come open in flight and had torn away from its hinges and had lodged securely against the leading edge of the port horizontal stabilizer. Preceding this, the passenger's step-down door had come open as the rear cargo door cannot open until the step-down door is opened. It is believed that the step-down door had not been securely latched.

				Total	15	2	1	-	9	-	-	-	3			
				GRAND TOTAL	296	14	4	1	55	90	11	7	114			

D. Irregular International Operations

1. Passenger Carrying Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
9/30/48		Basra, Iraq	Skyways International Trading & Transport Co.	Curtiss C-46F	41	-	-	-	4	-	-	-	37	Subst.		

On the take-off at Basra with the plane loaded to near allowable load and with hot, still air conditions prevailing, the plane was loggy and failed to get off. The pilot cut the throttles and applied brakes, but was forced to groundloop to avoid going into the Tigris River. On the groundloop a ditch was struck. The evidence shows no specific cause, other than general doubtful technique of the pilot and poor maintenance and operations due to the financial disintegration of the company.

2. Other Revenue Operations

1/27/48	Yes	Honolulu, T. H.	Transocean Air Lines	C-54	6	-	-	-	6	-	-	-	-	Subst.		

Aircraft was enroute from Honolulu to Wake Island at 8,500 feet when a sharp jar was felt and the Third Pilot brought word to the cockpit that the cabin door had broken away and had hit and stuck to the leading edge of the left horizontal stabilizer. A return to Honolulu was immediately started. Gasoline was dumped and crash preparations made upon arrival as the plane was heavily loaded. A fast but successful landing was made and pilot was able to brake the plane to a stop before reaching the end of the runway. The cause of the door coming loose has not been reported but it seems likely that the emergency release handle had been inadvertently moved, though this cannot be substantiated.

12/7/48		Maracaibo, Zulia, Venezuela	Miami Airlines	DC-3	2	-	-	-	2	-	-	-	-	Subst.		

Pilot failed to correct adequately for drift on the landing and a groundloop ensued.

				Total	8	-	-	-	8	-	-	-	-			

3. Non-revenue Operations (Test, Ferrying, Training, Check, Publicity, Familiarization, Company Flights, etc.)

No accidents.

				GRAND TOTAL	49	-	-	-	12	-	-	-	37			

E. Alaskan Air Carriers

1. Passenger Carrying

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
5/26/48		Koyuk, Alaska	Northern Consolidated Airlines	Stinson SR-5E	2	-	1	-	-	-	1	-	-	Destroyed		

While in cruising flight, the left tank was turned off and the right one on. About a minute later the engine quit. A forced landing was made in tall trees. Occupants were rescued by local Indians. Cause of engine failure undetermined.

9/3/48		Nr. Ketchikan, Alaska	Alaska Coastal Airlines	Grumman G-21A	8	-	-	-	1	-	-	-	7	Subst.		

While in normal flight over Ernest Sound, Alaska at 500 feet altitude, the right engine cowling became detached and struck the right stabilizer shearing off a large portion as well as a smaller portion of the right elevator. As the pilot was able to regain control following a short dive and the plane handled well, he decided to continue on to Ketchikan where a normal and uneventful landing was made. As the failure occurred over deep water, recovery of the missing parts was impossible, but inspection of the remaining engine cowling disclosed a broken turnbuckle trunnion and it is believed that a similiar failure occurred on the right cowling. The felt padding between the cowling and metal ring to which it was attached was found to be old and hard, necessitating considerable tightening of the turnbuckles, thus increasing the strain on them.

9/7/48		Woodchopper, Alaska	Wien Alaska Airlines	Stinson SR-9C	3	-	-	2	-	-	-	-	1	Destroyed		

All engine instruments checked normally on the ground run-up, but on the take-off the rpm dropped off and aircraft started clipping the tops of trees. A landing was made and the plane was wrecked by striking stumps. The operators feel that the difficulty was due to the propeller counterweights being out of adjustment. Investigator corroborates this, but cites additional facts; that plane was loaded to gross limits and was being flown from a comparatively short runway with probable downdrafts existing.

12/11/48		Nation, Alaska	Alaska Airlines	Pilgrim 100-B	3	-	-	-	1	-	-	-	2	Subst.		

In taxying out, struck a pile of dirt, crumpling gear and nosing plane up.

12/18/48	Yes	Anchorage, Alaska	Reeve Aleutian Airways	DC-3	23	-	-	-	2	-	-	-	21	Subst.		

Prior to take-off, a check was made for ice on the wing and control surfaces. The upper surfaces were all free of ice except the wing de-icing boots which had a thin layer, about 1/4 inch in thickness. This was not removed, however. On the take-off, 43 inches Hg was used and as the plane became airborne the gear was retracted. The plane began to settle and finally contacted the ground 324 feet from west end of runway after striking three parked aircraft with the wing tips. The plane came to rest 411 feet beyond end of runway. The Captain's failure to have all ice removed and to utilize higher manifold pressures on the take-off are the outstanding causative factors present.

E. Alaskan Air Carriers

1. Passenger Carrying

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
12/19/48	Yes	Minneapolis, Minnesota	Alaska Airlines	DC-4	39	-	-	-	3	-	-	-	36	Subst.		

On an instrument approach with reduced visibility and ice on the windshield, the plane was landed with 3,500 feet of runway remaining. Glare ice and snow on the runway made braking action ineffective. Went off the end of the runway at a speed of 15-20 mph and turned to avoid an approach light but caught it with the underside of the left wing. The plane was then taxied to the ramp.

12/21/48		Fairbanks, Alaska	Lavery Airways	DC-3	11	-	-	-	2	-	-	-	9	Subst.		

On the take-off, plane lifted from ground at an indicated speed of 75 mph. Immediately after becoming airborne, however, the left wing dipped and the plane veered 45 degrees to the left. The landing gear collided with a six foot embankment and the plane settled into the snow 300 feet from the embankment. Passengers were quickly evacuated. The evidence indicates that pilot pulled aircraft off too soon and failed to utilize the runway ahead to gain sufficient speed.

				Total	89	-	1	2	9	-	1	-	76			

2. Other Revenue Operations

2/6/48		Candle, Alaska	Alaska Airlines	Stinson SR-9	1	-	-	-	1	-	-	-	-	Subst.		

Pilot was making a take-off from a frozen river. A barrel was buried in the ice and covered with snow, being almost impossible to see. Just as plane was airborne the left ski hit the barrel snapping the landing gear leg off. Pilot proceeded to an airport where he states that a landing was made without further damage.

4/6/48		Cordova, Alaska	Alaska Airlines	C-54	4	-	-	-	3	-	-	-	1	Subst.		

As flight taxied up to ramp and the nose wheel was straightened up preparatory to stopping, it was noted that unusually heavy pressure was needed on the wheel. Almost immediately the warning horn blew, red light came on, the green nose wheel light went off and the nose wheel started to collapse. The switches were cut and the forward motion was stopped before the propellers dug into the cement. Investigation showed failure to be due primarily to deterioration of the composition chevrons in the piston of the nose wheel retracting cylinder. A change in the location of the restrictive orifice in the nose wheel retraction return line had not been complied with in accordance with a service bulletin which had been issued. The evidence indicates, however, that the trouble did not originate at this point.

E. Alaskan Air Carriers

2. Other Revenue Operations

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In Air	Fire: After Impact
6/8/48		Beaver, Alaska	Wien Alaska Airlines	Noorduyn UC-64A	1	-	-	-	1	-	-	-	-	Destroyed		

While attempting to start the engine, pilot, through over priming and improper use of throttle, caused an excessive amount of fuel to be present in the intake manifold and carburetor air-scoop. He again energized and engaged the starter (after two failures to start engine) when the engine backfired setting fire to the unvaporized fuel in the manifold and air-scoop. Pilot was unable to control the fire with extinguishing equipment available, resulting in aircraft and a considrable amount of U. S. mail being destroyed.

8/10/48		Taylor, Alaska	Wien Alaska Airlines	Pilgrim 100-A	1	-	-	-	1	-	-	-	-	Destroyed		Yes

Aircraft was nearing end of landing roll when it started to groundloop. Pilot states brakes are not effective when this aircraft is landed and before he could recover and straighten out with power, the aircraft ran over an abrupt 10 foot bank. Aircraft hit on its nose and immediately caught fire.

12/11/48		Koyuk, Alaska	Alaska Airlines	Stinson SR-9	2	-	-	-	2	-	-	-	-	Subst.		

On taking off, plane hit a snow drift about 10 inches high and the axle sheared off.

12/12/48		Boundary, Alaska	Alaska Airlines	Stinson SR-9C	1	-	-	-	1	-	-	-	-	Subst.		

On taking off, the left ski hit a small mound of frozen dirt which was covered with snow. Left gear collapsed and plane nosed up.

				Total	10	-	-	-	9	-	-	-	1			

3. Non-revenue Operations (Test, Ferrying, Training, Check, Publicity, Familiarization, Company Flights, etc.)

5/14/48		Fairbanks, Alaska	Lavery Airlines	Noorduyn UC-64A	1	-	-	-	1	-	-	-	-	Subst.		

On take-off climb at 300 feet, engine quit and fuel pressure was noted to be at zero. Switching tanks and using wobble pump failed to correct this and a landing was made in a willow patch. Investigation disclosed fuel stoppage to be cause of the engine failure due to a defective selector valve which having no click or centering feel when turned to different positions and having considerable back lash, was in partially closed position causing engine to starve.

E. Alaskan Air Carriers

3. Non-revenue Operations (Test, Ferrying, Training, Check, Publicity, Familiarization, Company Flights, etc.)

Date	At Night	Location	Operator	Equipment	Total Aboard	Injury: Crew F	Crew S	Crew M	Crew N	Passengers F	Passengers S	Passengers M	Passengers N	Aircraft Damage	Fire: In air	Fire: After Impact
8/17/48	Yes	McKinley Park, Alaska	Northern Consolidated Airlines	Stinson V-77	1	-	-	-	1	-	-	-	-	Subst.		
It appears one tire picked up a nail during take-off causing a slow leak. The tire was flat on landing and aircraft groundloops before pilot could recover.																
9/18/48		Ft. Yukon, Alaska	Wien Alaska Airlines	Republic Seabee RC-3	1	-	-	-	1	-	-	-	-	Subst.		
During a normal landing, the gear folded due to failure of the attaching lugs on the landing gear actuating cylinder. As the plane settled, both wing floats were torn off.																
				Total	3	-	-	-	3	-	-	-	-			
				GRAND TOTAL	102	-	1	2	17	-	1	-	76			

RECAPITULATION OF U. S. AIR CARRIER ACCIDENTS
(Calendar Year 1948)

Type of Operation	Total Accidents	Fatal Accidents	Aircraft Damage			Division of Crew Injury				Division of Passenger Injury				Total Aboard	Fire			See Pages
			Destroyed	Substantial	Minor-None	Fatal	Serious	Minor	None	Fatal	Serious	Minor	None		In Air	After Impact	On Ground	
Scheduled Domestic																		
Passenger Carrying....	53	5	7	44	2	15	2	4	165	83	4	16	980	1269	5	5	1	1-13
Other Revenue...	1	-	-	2	1	-	-	-	10	-	-	-	5	15	-	-	-	14
Non-revenue.....	5	-	-	5	-	-	-	-	12	-	-	-	-	12	-	1	1	14-15
Non-scheduled.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
Sub-Total.....	61	5	7	51	3	15	2	4	187	83	4	16	985	1296	5	6	2	
Scheduled International																		
Passenger Carrying....	11	1	1	10	-	10	-	1	52	20	-	1	261	345	3	3	-	16-19
Other Revenue.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19
Non-revenue.....	3	1	1	2	-	2	2	2	6	-	-	-	-	12	-	1	-	19-20
Non-scheduled.....	1	1	1	-	-	6	-	-	-	24	-	-	-	30	-	1	-	20
Sub-Total.....	15	3	3	12	-	18	2	3	58	44	-	1	261	387	3	5	-	
Irregular Domestic																		
Passenger Carrying....	17	4	6	10	1	9	2	1	28	90	11	7	109	257	1	-	-	21-25
Other Revenue.....	11	2	3	8	-	3	1	-	18	-	-	-	2	24	1	2	1	26-28
Non-revenue.....	7	1	2	5	-	2	1	-	9	-	-	-	3	15	1	2	-	29-30
Sub-Total.....	35	7	11	23	1	14	4	1	55	90	11	7	114	296	3	4	1	
Irregular International																		
Passenger Carrying....	1	-	-	1	-	-	-	-	4	-	-	-	37	41	-	-	-	31
Other Revenue.....	2	-	-	2	-	-	-	-	3	-	-	-	-	8	-	-	-	31
Non-revenue.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31
Sub-Total.....	3	-	-	3	-	-	-	-	12	-	-	-	37	49	-	-	-	
Alaskan Air Carriers																		
Passenger Carrying....	7	-	2	5	-	-	1	2	9	-	1	-	76	89	-	-	-	32-33
Other Revenue.....	6	-	2	4	-	-	-	-	9	-	-	-	1	10	-	1	1	33-34
Non-revenue.....	3	-	-	3	-	-	-	-	3	-	-	-	-	3	-	-	-	34-35
Sub-Total.....	16	-	4	12	-	-	1	2	21	-	1	-	77	102	-	1	1	
Total																		
Passenger Carrying....	89	10	16	70	3	34	5	8	258	193	16	24	1463	2001	9	8	1	
Other Revenue.....	22	2	5	16	1	3	1	-	45	-	-	-	8	57	1	3	2	
Non-revenue.....	18	2	3	15	-	4	3	2	30	-	-	-	3	42	1	4	1	
Non-scheduled.....	1	1	1	-	-	6	-	-	-	24	-	-	-	30	-	1	-	
Grand Total.....	130	15	25	101	4	47	9	10	[illegible]	[illegible]	16	24	1474	2130	11	16	4	