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NASA 1975 MISHAP AND INJURY DATA

OFFICE OF SAFETY AND ENVIRONMENTAL HEALTH

WASHINGTON D. C. 20546

NASA

National
Aeronautics and
Space
Administration

FOREWORD

This is NASA's annual statistical report on mishaps and injuries which were reported as happening to NASA civil servants. However, some mishaps, including all three fatalities, encompassed NASA contractor employees and the public and are so stated in the charts or text.

As in past years, we have some bright spots that appear in the statistics, i.e. the number of fires reported has been reduced by a factor of over two, and our NASA aviators have considerably lowered their accident rate. Unfortunately, almost all our other statistics have worsened in the past year. While the number of NASA employees has continued its steadily downward trend, the number of lost time injuries again rises rather consistently. The injury frequency rate also continues the steady rise that has been noted since the lunar missions started in 1969. Other rising rates to be noted are: cost of fires per annum, automotive accident frequency rate, total cost of NASA mishaps (our equipment is getting more costly to replace/repair) and costs NASA transfers to the Federal Compensation Fund.

I feel that I must reiterate what I said last year in the report: each line manager/supervisor in NASA is responsible and accountable for safety. Without their wholehearted support in attempting to reverse these adverse trends in accidents and injuries that are reported to OSHA, we will face a continuing decline in our agency's safety posture.

R. P. Prichard

Reuben P. Prichard
Acting Director, Safety
and Environmental Health

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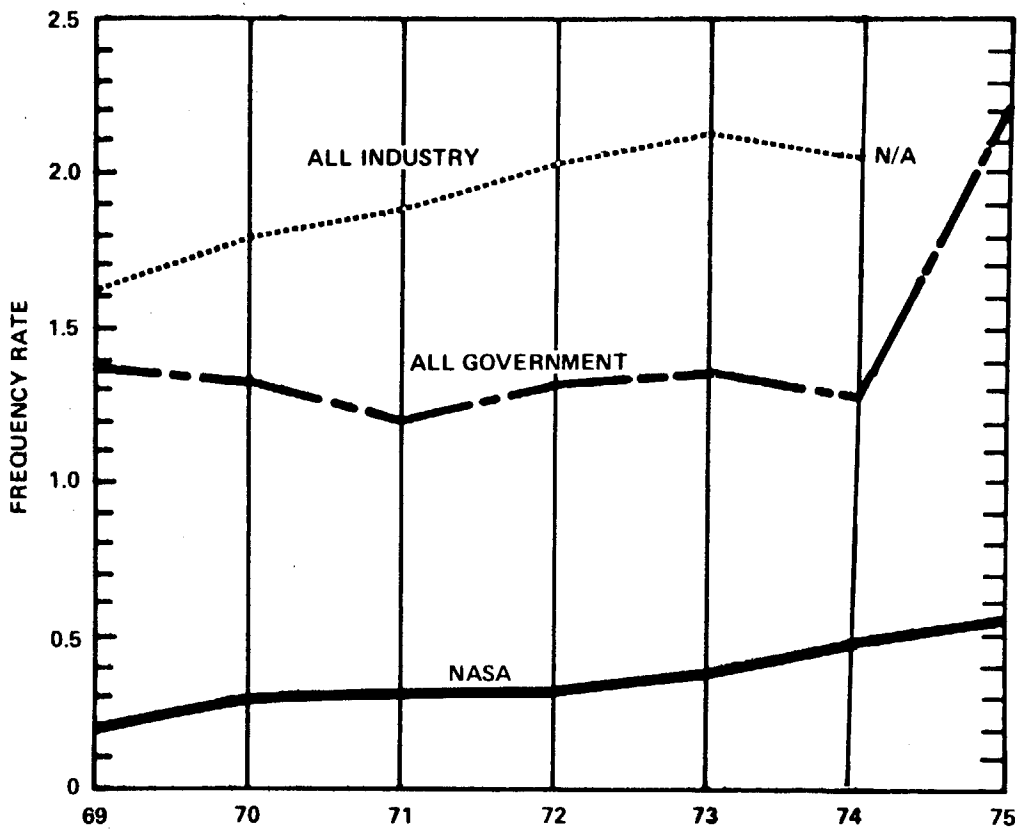
NASA INJURY EXPERIENCE 1969 THROUGH 1975



	69	70	71	72	73	74	75
FREQUENCY RATE – NASA	.20	.29	.30	.30	.37	.49	.54
*FREQUENCY RATE – ALL GOVERNMENT	1.38	1.32	1.20	1.30	1.36	1.28	2.25
†FREQUENCY RATE – ALL INDUSTRY	1.62	1.77	1.87	2.03	2.11	2.04	N/A
AVERAGE NUMBER OF NASA EMPLOYEES	32,600	31,200	29,100	28,300	27,900	26,700	26,023
LOST TIME INJURIES – NASA	63	85	83	79	93	116	127

FREQUENCY RATE IS DEFINED BY OSHA AS THE NUMBER OF LOST TIME INJURIES PER 200,000 MAN-HOURS WORKED.

* SOURCE: OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION, DEPT. OF LABOR

† SOURCE: NATIONAL SAFETY COUNCIL

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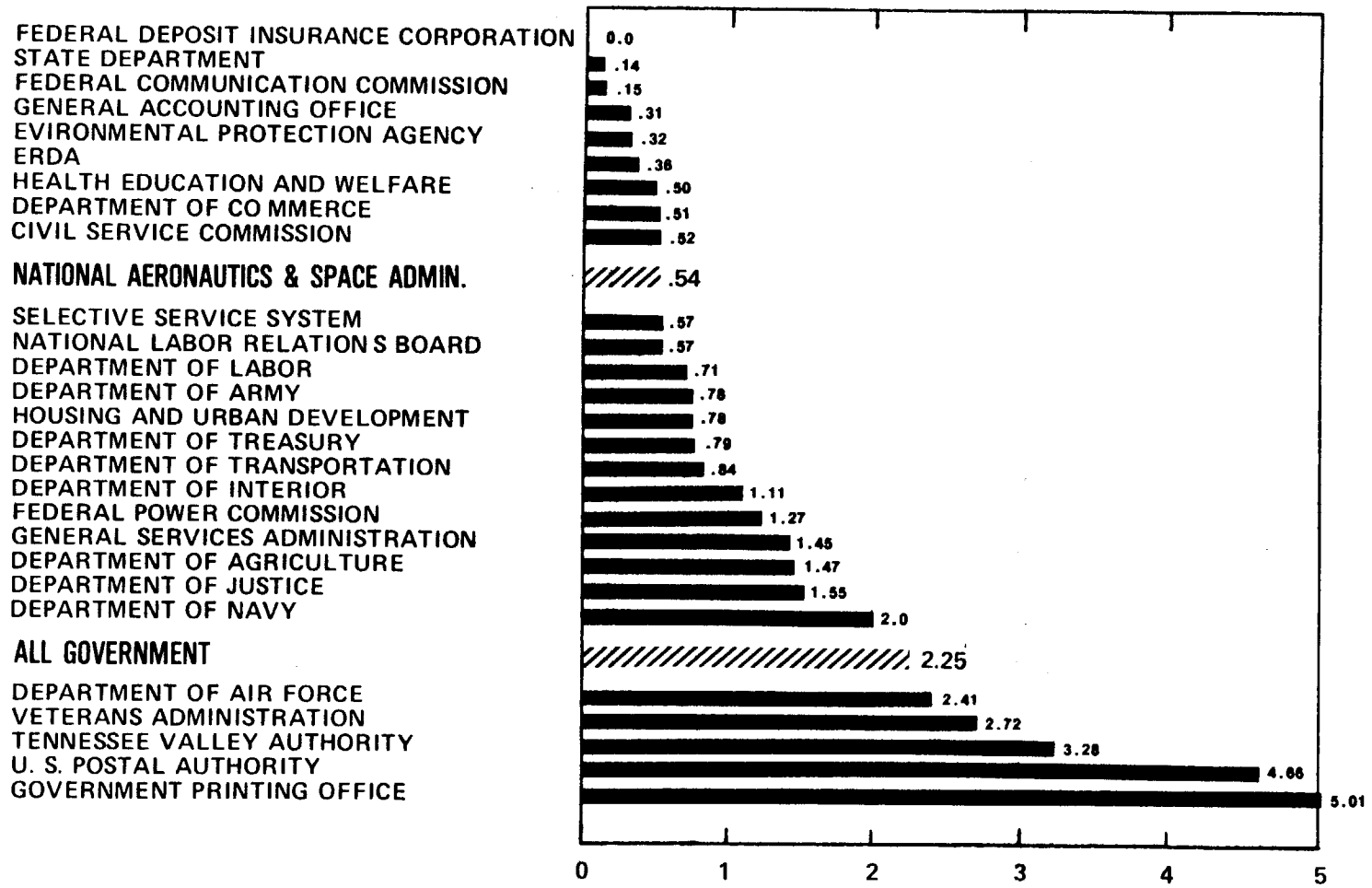
LOST WORK DAY CASES IN FEDERAL AGENCIES OCCUPATIONAL INJURY RATES FOR CIVILIAN PERSONNEL PER 200,000 MAN-HOURS -1975



SOURCE:Occupational safety and health administration, U.S. Department of Labor

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COSTS OF 1975 NASA ACCIDENT/INCIDENTS/INJURIES

MANPOWER LOSS:		0	FATALITIES
		623	NON-LOST TIME INJURIES
		127	LOST TIME INJURIES
		2116	WORK DAYS LOST = 8 MAN-YEARS EFFORT
MONEY LOSS:	WAGES		$ 172,064 = 8 MAN-YEARS @ AVERAGE NASA 1975 WAGE OF $ 21,508/YEAR
	CHARGE BACK BILLING TO FEDERAL EMPLOYEES COMPENSATION FUND (FY 1975)		$2,121,765

MATERIAL LOSS:			NO. OF MISHAPS
	AIRCRAFT	$ 92,272	3
	VEHICLES	19,364	60
	FIRE	4,025,515	42
	OTHER PROPERTY	617,578	17
TOTAL LOSS:		$7,048,558	122

DOES NOT INCLUDE CONTRACTOR DATA.

DOES NOT INCLUDE MISSION FAILURES.

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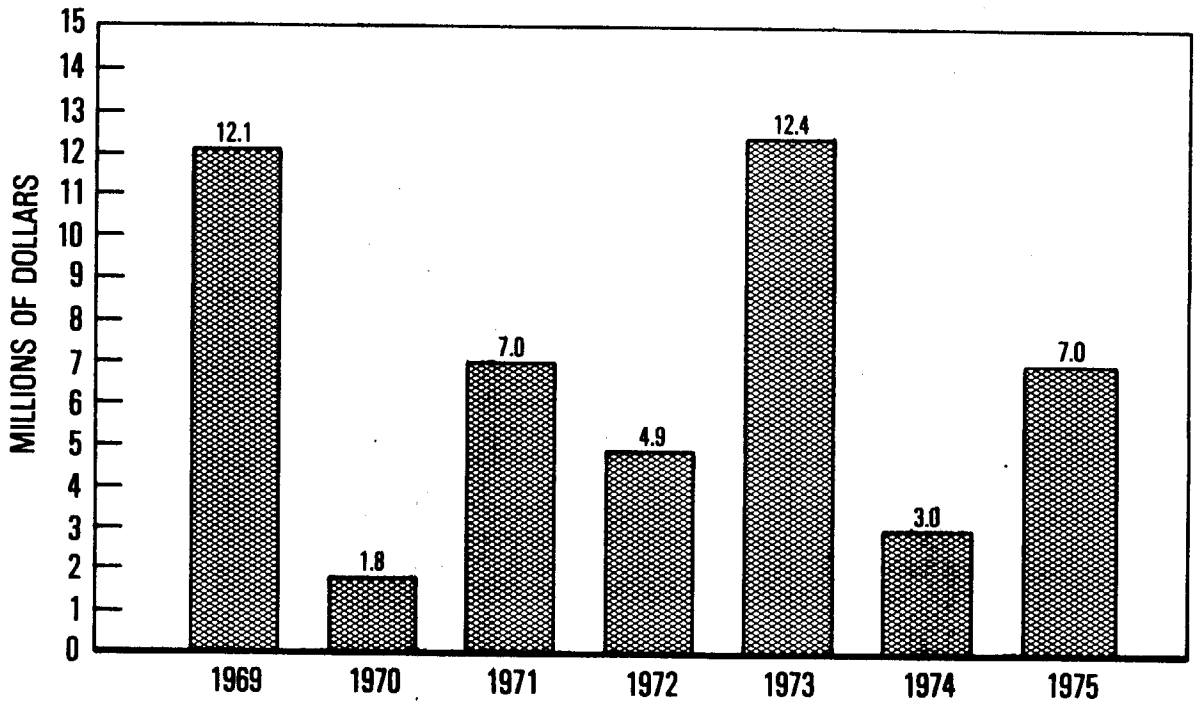
TOTAL COSTS TO NASA DUE TO MISHAPS*



* DOES NOT INCLUDE MISSION FAILURES.
DOES NOT INCLUDE CONTRACTOR LOSSES.

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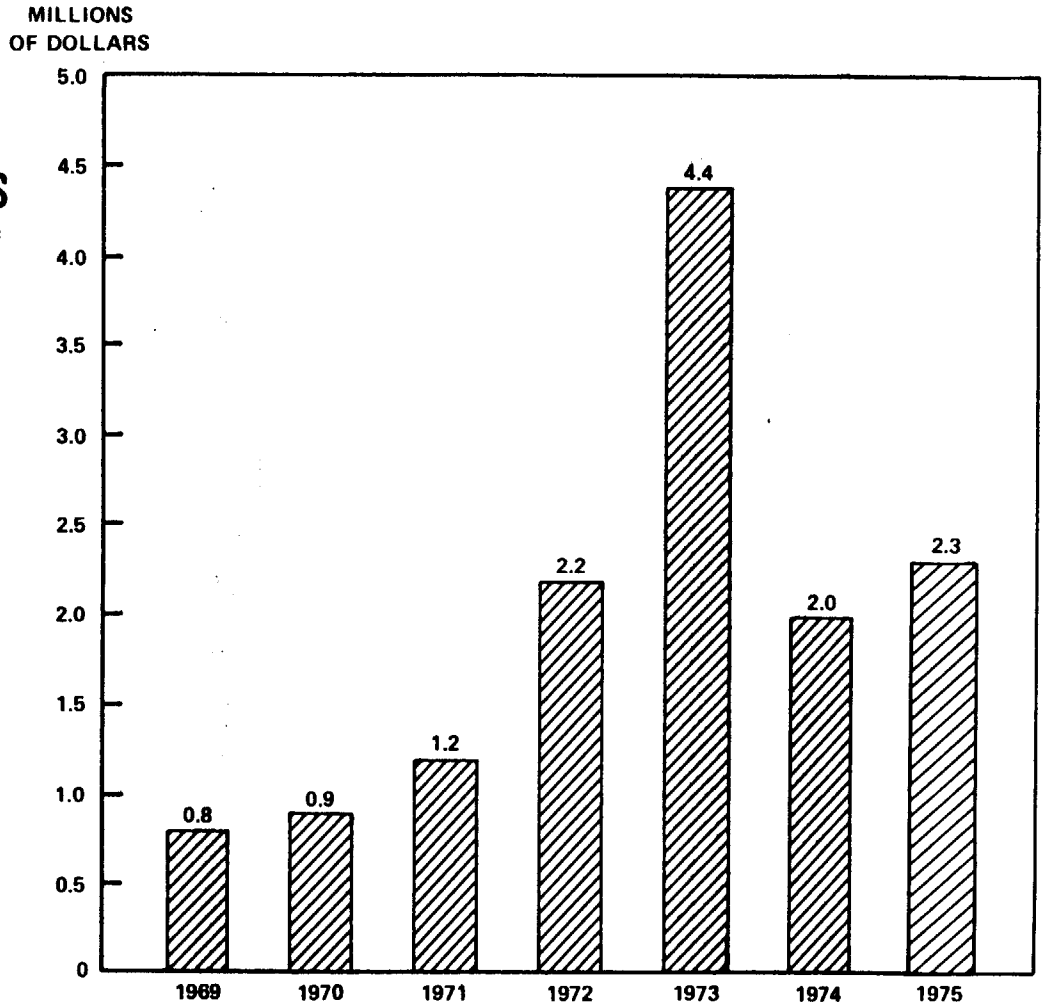
NASA MONEY LOSSES DUE TO MISHAPS *



* INCLUDES LOST WAGES AND CHARGE BACK BILLING TO THE FEDERAL EMPLOYEES COMPENSATION FUND, BUT DOES NOT INCLUDE CONTRACTOR LOSSES.

TWO FATALITIES IN 1972 AND SEVEN IN 1973 DROVE COSTS UP FOR THOSE YEARS.

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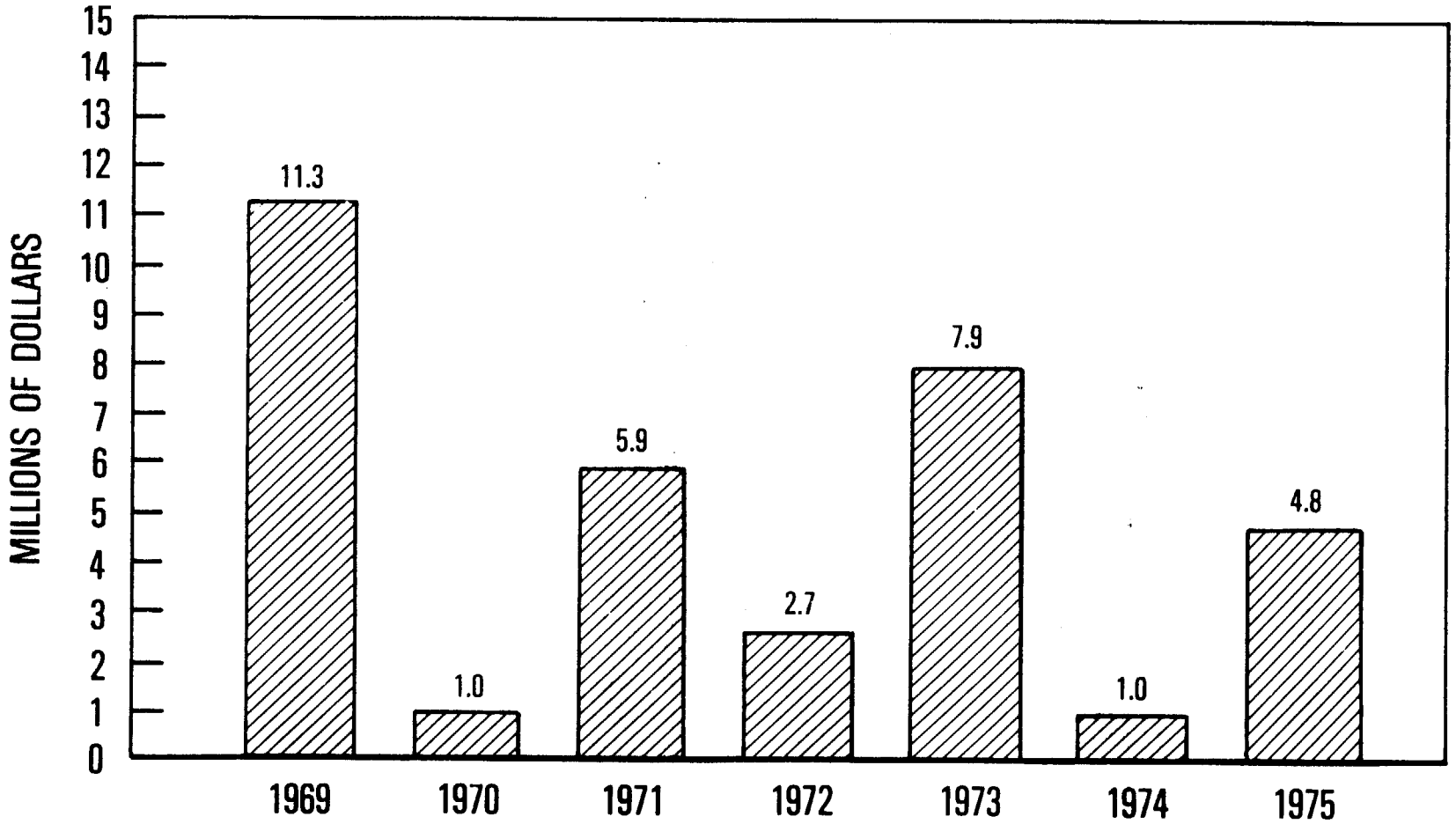
NASA MATERIAL LOSSES DUE TO MISHAPS*



* INCLUDES AIRCRAFT, VEHICLE, AND FIRE MISHAPS AND LOSSES OF OTHER PROPERTY.
DOES NOT INCLUDE MISSION FAILURE COSTS.
DOES NOT INCLUDE CONTRACTOR LOSSES.

CONVAIR 990 LOSS IN 1973 DROVE COSTS UP THAT YEAR.

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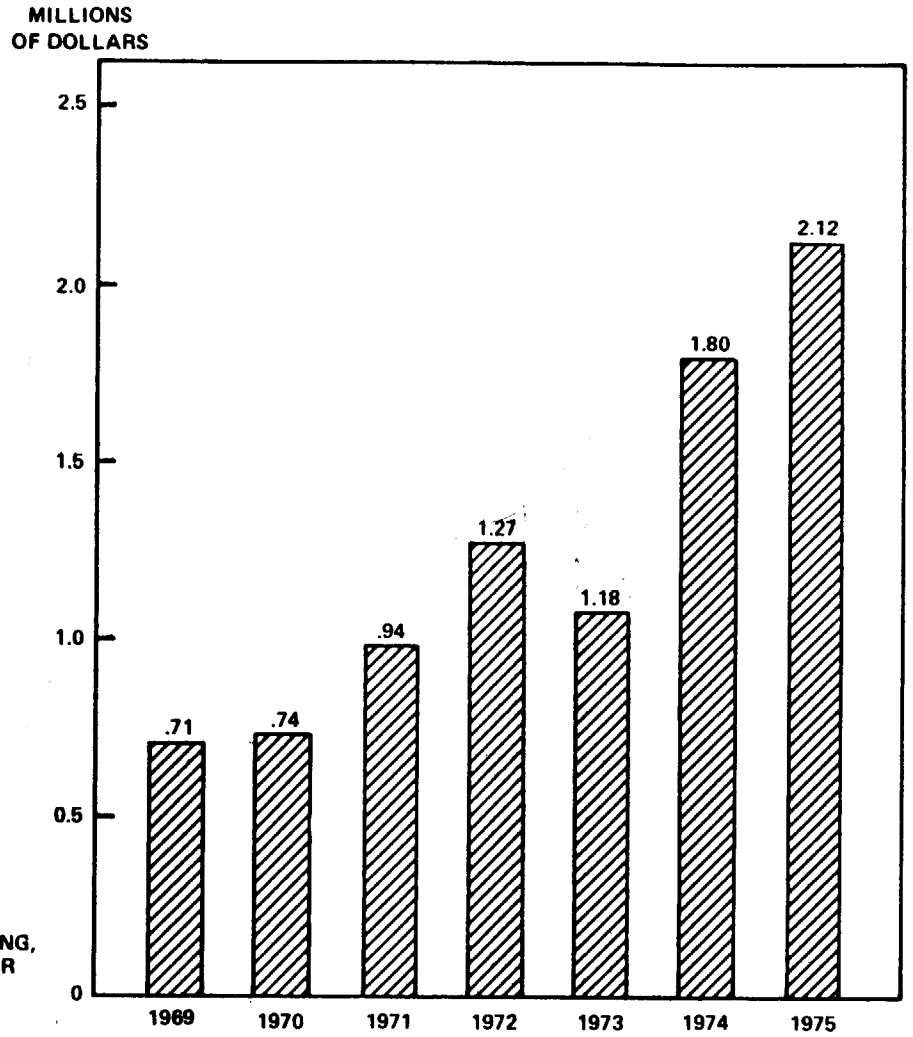
COSTS NASA PAID TO FEDERAL EMPLOYEES COMPENSATION FUND

(BY FISCAL YEARS)



1. THESE COSTS ARE CHARGED AGAINST NASA AS REIMBURSEMENT TO THE FEDERAL EMPLOYEES COMPENSATION FUND FOR PAYMENTS MADE ON ACCOUNT OF IN JURY OR DEATH OF NASA EMPLOYEES OR PERSONS UNDER THE JURISDICTION OF NASA .

2. THE SLIGHT DECREASE FOR FY 73 MAY HAVE BEEN DUE TO A CHANGE OF STATUS OF BENEFICIARIES, I.E. WIDOWS REMARRYING, DEPENDENT CHILDREN COMING OF AGE, OR DEATH OF THE PRINCIPAL .

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NASA ACCIDENT/INCIDENT EXPERIENCE IN 1975

DEFINITIONS:

1. Type A Accident - A mishap causing death, disabling injury to five or more persons, damage to equipment or property exceeding $100,000, or destruction of an aircraft.

2. Type B Accident - A mishap causing disabling injury to four or fewer persons or damage to equipment or property exceeding $10,000, but under that of a Type A accident.

3. Incident - A mishap of less than accident severity to persons or property, causing less than $10,000 in damages, but exceeding $100, or a non-serious injury.

4. Mission Failure - Any event which jeopardized a mission, prevents accomplishment of major mission objectives, or causes premature mission termination.

5. Costs - Direct costs of repair, replacement or recovery, including man-hours, material and contract costs, but excluding indirect costs of clean-up, investigation, injury, and normal operational delay.

TOTAL NASA SIGNIFICANT MISHAPS

The significant mishaps shown on the following charts are only those reported by the NASA Field Installations and contractors as having significance beyond the minor dollar loss or injury incident categories.

	1969	1970	1971	1972	1973	1974	1975
FATAL ACCIDENTS	4	2	2	3	2	2	3
TYPE A ACCIDENTS	11	6	13	11	4	6	10
TYPE B ACCIDENTS	7	12	11	7	6	11	12
INCIDENTS	12	20	24	9	22	13	8
MISSION FAILURES	1	1	3	0	3	2	2
ALL MISHAPS	30	38	44	29	32	30	35

TYPE A/B ACCIDENTS BY FIELD INSTALLATIONS

	1967	1968	1969	1970	1971	1972	1973	1974	1975
AMES	0/1	0/0	0/0	0/0	0/0	0/0	1/0	0/2	1/0
FLIGHT	2/1	0/0	0/1	1/0	1/0	0/0	0/0	0/0	0/0
GODDARD	0/0	0/0	4/0	0/3	2/3	0/1	0/0	0/1	0/2
JOHNSON	4/4	2/2	1/1	3/1	3/3	6/2	1/0	0/5	0/1
KENNEDY	2/1	4/0	2/1	2/1	1/0	1/0	0/1	2/1	4/1
LANGLEY	0/0	0/0	0/1	0/1	1/0	0/1	0/1	0/1	0/2
LEWIS	0/2	0/0	1/0	0/0	3/0	2/0	0/1	0/0	0/1
MARSHALL	4/5	0/2	3/2	1/4	3/3	6/2	1/0	1/0	1/1
NSTL	-	-	-	-	-	-	-	0/0	0/1
WALLOPS	1/0	1/0	1/0	0/1	0/2	0/0	0/0	1/1	0/0
TRACKING STATIONS	-	-	-	-	-	-	1/3	2/0	2/2
HDQTRS.	-	-	-	-	-	-	-	-	2/1
NASA TOTAL	13/14	7/4	12/6	7/11	14/11	15/6	4/6	6/11	10/12

Notes: Prior to 1974, MSFC included NSTL.
JPL has been excluded from the table.

ANALYSIS: The numbers of Type A and B accidents continued to rise from a low back in 1973. More supervisory overview of potentially hazardous operations would undoubtedly enhance the present adverse statistics now emanating from the field installations. The several re-design recommendations made in the accident tables clearly show that the original designs were nothing but poor. It therefore behooves NASA to ascertain that some review is made of original engineering design work. The best tool for this is obviously a Systems Safety Analysis or Hazard Analysis followed by an Operational Readiness Inspection (ORI) and proper initiation of step-by-step operating procedures and certification of personnel for all potentially hazardous operations.

RECOMMENDATIONS: These are quite evident from the "ANALYSIS" above, i.e. conduct a System Safety Review and make a Safety Analysis Report (SAR) after the ORI.

FATAL ACCIDENTS AND FATALITIES

	1969	1970	1971	1972	1973	1974	1975
Number of Fatal Accidents	4	2	2	3	2	2	3
Total No. of Fatalities	4	2	5	4	17	3	3
NASA Employees	0	0	0	2	7	0	0
Contractor Employees	4	2	3	2	4	1	1
Public	0	0	2	0	1	2	2
Military	0	0	0	0	5	0	0

Three fatal accidents occurred in 1975 involving NASA and/or NASA contractor personnel:

1. A NASA contractor-operated van skidded on an icy road into a two-car collision wherein a 12-year old girl later died. There was no culpability assigned to the NASA van or its driver.

2. A NASA contractor employee crashed his pickup truck into the rear of a slower moving NASA vehicle, fatally injuring himself. An autopsy disclosed the contractor employee was intoxicated.

3. A privately owned vehicle (POV) swerved into an oncoming NASA vehicle head-on. The POV driver was killed. An autopsy showed him to be under the influence of prescription drugs and alcohol, a lethal combination.

NASA TYPE "A" ACCIDENTS AND MISSION FAILURES - 1975

LOCATION	DATE	DESCRIPTION	CAUSE	COST	RECOMMENDED CORRECTIVE ACTION
KSC	2-20	Atlas/Centaur failed after booster cut-off	Umbilical failed to disconnect properly	None to NASA	Re-design umbilical disconnects
PA	3-2	NASA van skidded into two collided vehicles, 12-year old girl killed	Icy roads, following too closely	-	Keep greater distance between vehicles on icy road
KSC	3-8	Pick-up truck hit NASA vehicle. Truck driver killed.	Truck driver intoxicated	-	Do not permit employees to drink on the job
Fort Irwin	3-26	Warehouse with NASA equipment burned	Welding in high winds	$900K	Don't weld in high winds
Rocket-Dyne	6-9	Shuttle turbo pump exploded and burned	Faulty pump	$1,000K	Re-design pump
ARC	8-5	3-1/2 Ft. wind tunnel explosion	Faulty bold installation	$500K	Re-design nozzle flange and use correct bolts
KSC	9-9	Fire at launch complex 41	Poor design	$3,200K	Re-design boom enclosure
Kitt Peak	9-13	Telescope mirror cracked	Unknown	$217K	None
GUAM	10-30	Head-on collision with NASA vehicle; fatal to other driver	Intoxicated driver swerved into NASA vehicle	-	None
WLOD	12-8	Scout vehicle 3rd stage failure	Nozzle failure	$7,200K	Re-design nozzle throat revert to old configuration

RESULTS OF A WIND TUNNEL EXPLOSION

NASA HQ YS76-3449 (2)
6-2-76

NASA TYPE "B" ACCIDENTS - 1975

LOCATION	DATE	DESCRIPTION	CAUSE	COST	RECOMMENDED CORRECTIVE ACTION
KSC	1-7	Contractor crane failed.	High winds	--	Don't operate cranes in adverse weather.
MSFC	3-25	Shuttle model destroyed by two "Tomahwk" SRM's.	Burn through	$30K	Re-design instrumentation fitting.
Univ. of Chicago	4-15	Experimental detectors destroyed.	Contaminated N_2	$70K	Inspect N_2 before using.
Rosman, N. C.	4-18	Generator electrical fire	Voltage fluctuations	$7K	Increase maintenance program.
LaRC	5-2	Shuttle model destroyed in wind tunnel	Fatigue crack in balance.	$30K	Control the special metals, x-ray, non-destructive tests, etc.
GSFC	5-26	Contractor computer fire	Dual failure of thermal switch and thermostat.	$40K	Increase inspection and maintenance programs.
Quito	8-28	Contractor suffered eye damage from heliarc.	No eye protection	--	Issue protective eyeglasses, increase supervision.
WSTF	9-17	Contractor hit by falling tank.	Tank not secure	--	Increase supervision of potentially hazardous operations.
LeRC	10-23	Hand pinched in belt of NASA-ERDA windmill.	Inattention	--	Increase supervision
NSTL	11-13	Stainless steel cable kinked.	Operator error	$40K	Increase supervision
LaRC	11-14	Model lost in wind tunnel	Overtorquing of head cap screws	$14K	Use correct torque, checkoff sheets, increase supervision.
GSFC	12-12	Payload vibrated at 25G's vice 0.75 G's.	Operator error.	$20K	Increase supervision, use of checkoff sheets, etc.

RESULTS OF A WIND TUNNEL EXPLOSION

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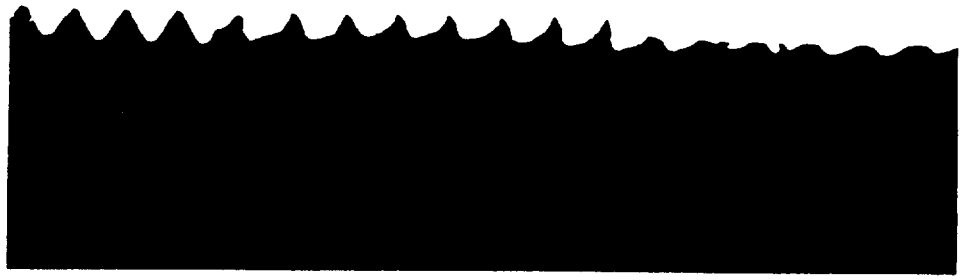
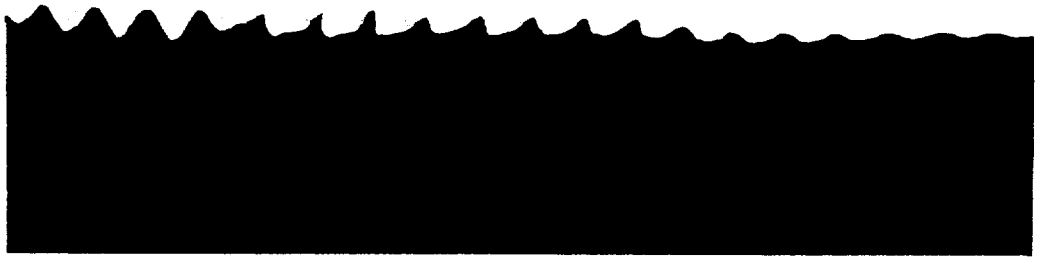




Profilometer Views of Bolt Threads Worn
Almost Smooth Due to Heavy Cyclic
Use - One of the Causes of a
Wind Tunnel Explosion

NASA CONTRACTOR HIGH PRESSURE VESSEL EXPLOSION RESULTS

NASA HQ YS76-3451 (3)
6-2-76

SIGNIFICANT NASA INCIDENTS - 1975

LOCATION	DATE	DESCRIPTION	CAUSE	COST	RECOMMENDED CORRECTIVE ACTION
FRC	1-16	F-15 scale model crashed.	Failure of in-flt. recovery system.	$7K	Re-calibrate and reset recovery apparatus.
Santiago	3-21	Untended vehicle rolled.	Inattention	--	Park in gear, use brakes, use chocks if necessary.
Santiago	3-30	Chilean National backed NASA truck into junction box.	Inattention	--	Wake up; be alert.
ARC	6-3	Sprinkler piping burst	Vibration from 40x80 wind tunnel fans	$2.5K	Re-design support structure
ARC	6-4	Output contactor failed	Spring and/or micarta fatigue.	$20K	Re-design output contactor
KSC	8-22	Navy balloon burst in VAB during inflation.	Split in fabric	--	None
MSFC	12-8	"Tomahawk" blew up.	Fault in manufacture	$5K	Straighten mandril
LaRC	12-29	Electrical fire in building insulation.	Short circuit in air conditioner.		Inspect facilities more frequently.

SAFETY AND ENVIRONMENTAL HEALTH SURVEYS
1975

The NASA Headquarters Safety and Environmental Health Survey Program in conjunction with Reliability and Quality Assurance visited eight installations during the 1975 calendar year:

Lewis Research Center	February 3-7, 1975
Ames Research Center	March 3-7, 1975
Dryden Flight Research Center	March 10-14, 1975
Kennedy Space Center	March 31-April4, 1975
Langley Research Center	April 7-11, 1975
Johnson Space Center	August 11-15, 1975
Wallops Flight Center	October 20-24, 1975
Marshall Space Flight Center	December 8-12, 1975

The surveys especially empahsized the four following areas:

1. Institutional Safey and Fire Protection
   a. OSHA Compliance
   b. Mishap Investigation and Analysis
   c. Maintenance of Fire Alarm, Detection & Suppression Systems
   d. Emergency Preparedness Plans
   e. Highway Safety

2. Ground Operation Safety
   a. Laser/Radiation Related Operations
   b. Explosive and Propellant Operations
   c. Toxic and Flammable Chemical Hazards
   d. High Energy & RF System Tests and Operations

3. Environmental Health
   a. Industrial Hygiene
   b. Radiological Health
   c. Water and Air Pollution
   d. Food Service Sanitation

4. Aviation Safety
   a. Flight Operations
   b. Aircraft Ground Operations
   c. Aircraft Maintenance and Inspection
   d. Crash and Fire Rescue

The Survey accomplishments and rewards for the year were significant. Each of the installations visited were receptive and responsive to the survey team's findings and recommendations. Generally, corrective action was carried out most expeditiously with the exception of those items which may require special budgetary assignments.

OCCUPATIONAL ILLNESSES

A total of 67 occupational illnesses were reported during 1975. All but one of these were non-lost time illnesses. The one lost time illness resulted in 35 lost work days.

NASA has a fairly comprehensive occupational health program which is geared to the control of health hazards in the work place and thus to the prevention of occupational disease. The low number of reported occupational illnesses is due in part to the various preventive activities associated with this program. However, these figures may not be indicative of the true incidence of such illness since it is quite well known that many illnesses have an occupational origin but are never recognized or reported. A study sponsored by the National Institute for Occupational Safety and Health found that about 80 percent of the occupational illnesses occurring in a select group of industrial facilities were either never recognized nor reported. Approximately 25 percent of the work force, however, had some form of job related illness.

If good statistics relative to the incidence of occupational illness are to ever be available, a concerted effort must be made to gather pertinent data. Most illnesses with an occupational origin do not show up immediately following exposure to a health stress or hazard and in some cases 20 to 30 years or more elapse before symptoms of the disease are manifested. Therefore, accurate records relative to employee work and exposure histroies must be obtained and kept up to date for extended periods of time. In NASA, we plan to establish guidelines in this area of concern.

NASA PERSONNEL INJURIES FOR 1975

ANALYSIS: For the sixth year NASA has been faced with a declining civil service population and an increase in the lost work day injuries and injury frequency rate. Lost time injuries increased again—to 127—vice last years high of 116.

As in the past, several field installations and establishments bettered the NASA "Safety '76" goal of 0.20 injuries per 200,000 man-hours worked. These were:

Dryden Flight Research Center
Johnson Space Center
Wallops Flight Center
National Space Technology Laboratories
NASA Pasadena Office
Michoud Assembly Facility

All of the other NASA installations had injury frequency rates considerably above the "Safety '76" goal.

The overall U.S. Government injury frequency rate made a quantum jump this year to 2.25. OSHA personnel have informally attributed this huge rise to (1) increased reporting on OSHA forms and (2) more employees taking advantage of the 45 days free administrative leave permitted to those personnel who receive on-the-job injuries.

In NASA since 1969 when we landed on the moon, our number of government employees has decreased by about 25% while the number of lost time injuries has more than doubled and our injury rate has increased by a factor of about 2 1/2. Several reasons follow which may account for this trend:

1. The federal employee has taken over many of the more hazardous "hands-on" type work previously performed by contractors.

2. Historically and statistically, major program efforts have the highest accident and injury rates at the beginning and end; with lowest rates ocurring near the peak program effort. NASA has experienced the end of Apollo and beginning of Space Shuttle.

3. Morale plays a key role in injuries. Esprit, glamour, and pride are down since 1969 when we attained the lunar goal.

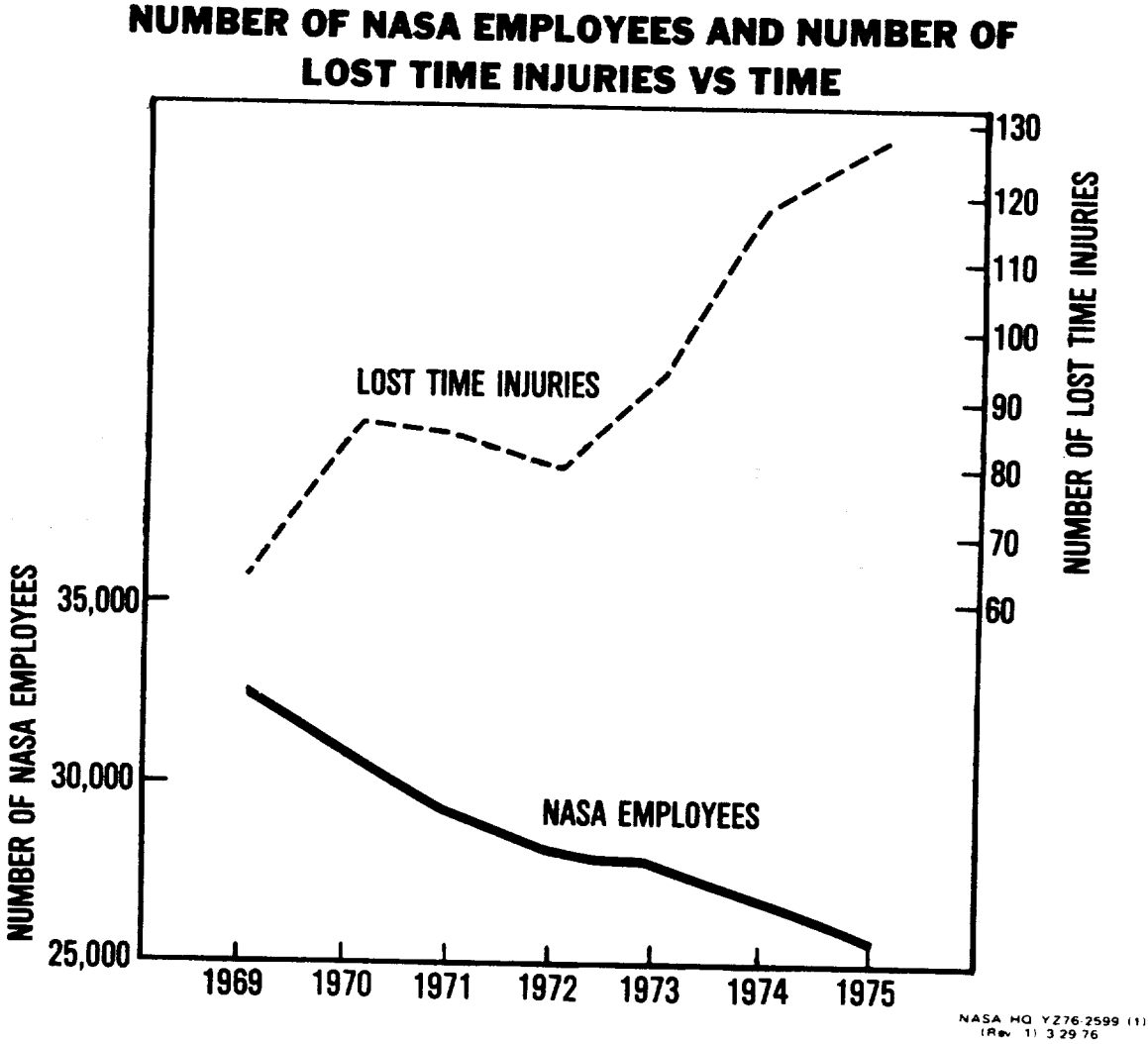
4. Aging of workforce

5. Reduction in full time functional safety people.

6. Increased reporting and liberalization of policy regarding disability retirements and workmens' compensation.

The installations with decreasing injuries and rates are those where injuries receive management attention and investigation by functional safety and health professionals as well as supervisors. Often the root causes of increased reported injuries are not solely due to workplace hazards. Whatever the causes, management attention can result in optimum corrective action.

RECOMMENDATIONS: Increased top level management and supervisor attention to ALL root causes of lost time injuries and workmens' compensation claims. Institute appropriate corrective actions where particular needs are indicated.



NASA INJURIES AND ILLNESSES BY INSTALLATIONS 1975

	NO OF EMPLOYEES	MAN HOURS WORKED IN K	TOTAL INJURY/ ILLNESS	NO. LOST WORKDAY CASES	NO. OF LOST WORKDAYS	INJURY FREQUENCY RATE THIS YEAR	LAST YEAR	INJURY SEVERITY RATE	AIRCRAFT MISHAP FREQ RATE	AUTO MISHAP FREQ RATE GOV.	P.O.V.	NO. OF FIRES	FIRE LOSS ($ K)	NO. OF OTHER MISHAPS	OTHER MISHAPS LOSS ($ K)	TOTAL COST MISHAPS OF ($ K)	MISHAP COST RATE
ARC	1857	3471	256	10	130	.57	.46	37.5	0	0	0	3	15	6	515	530	152.7
DFRC	547	948	16	1	3	.21	0	3.2	0	0	0	0	0	0	0	0	0
GSFC	3889	7237	39	16	121	.44	.55	16.7	0	5.9	0	22	808	7	30	838	115.8
JSC	3997	6787	16	2	8	.06	.36	1.2	1.0	0	0	9	1	0	0	88.7	13.1
KSC	2366	4606	28	17	498	.74	.39	108.1	0	2.5	4.1	2	3000	0	0	3000	651.3
LARC	3520	6175	181	16	121	.52	.35	3.7	6.9	18.3	0	0	0	0	0	4.6	.8
LERC	3150	5715	148	36	611	1.26	.87	106.9	0	19.4	0	4	0	2	.05	3.4	.6
MAF	33	57	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
MSFC	4444	7736	41	24	606	.62	.66	78.3	3.3	3.6	0	0	0	2	72	74	9.6
NSTL	68	143	0	0	0	0	—	0	0	0	0	0	0	0	0	0	0
NAPO	35	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WFC	437	786	0	0	0	0	0	0	0	1.7	0	0	0	0	0	0	0
HQ	1680	3400	25	5	18.25	.29	.19	5.4	0	0	0	0	0	0	0	0	0
TOTAL	26023	47137	750	127	2116.25	.54	.49	44.9	11.3	5.7	1.1	42	3824	17	617.05	4538.7	943.9
LAST YR	26733	47459	882	116	2951	.49	—	62.2	13	5.5	.80	—	—	—	—	—	—

$$\text{SEVERITY RATE} = \frac{\text{NUMBER OF MAN-DAYS LOST}}{\text{TOTAL MAN-HOURS WORKED}} \times 1{,}000{,}000$$

SEVERITY RATE IS THE NUMBER OF MAN-DAYS LOST BY ACCIDENTS PER MILLION MAN-HOURS WORKED.

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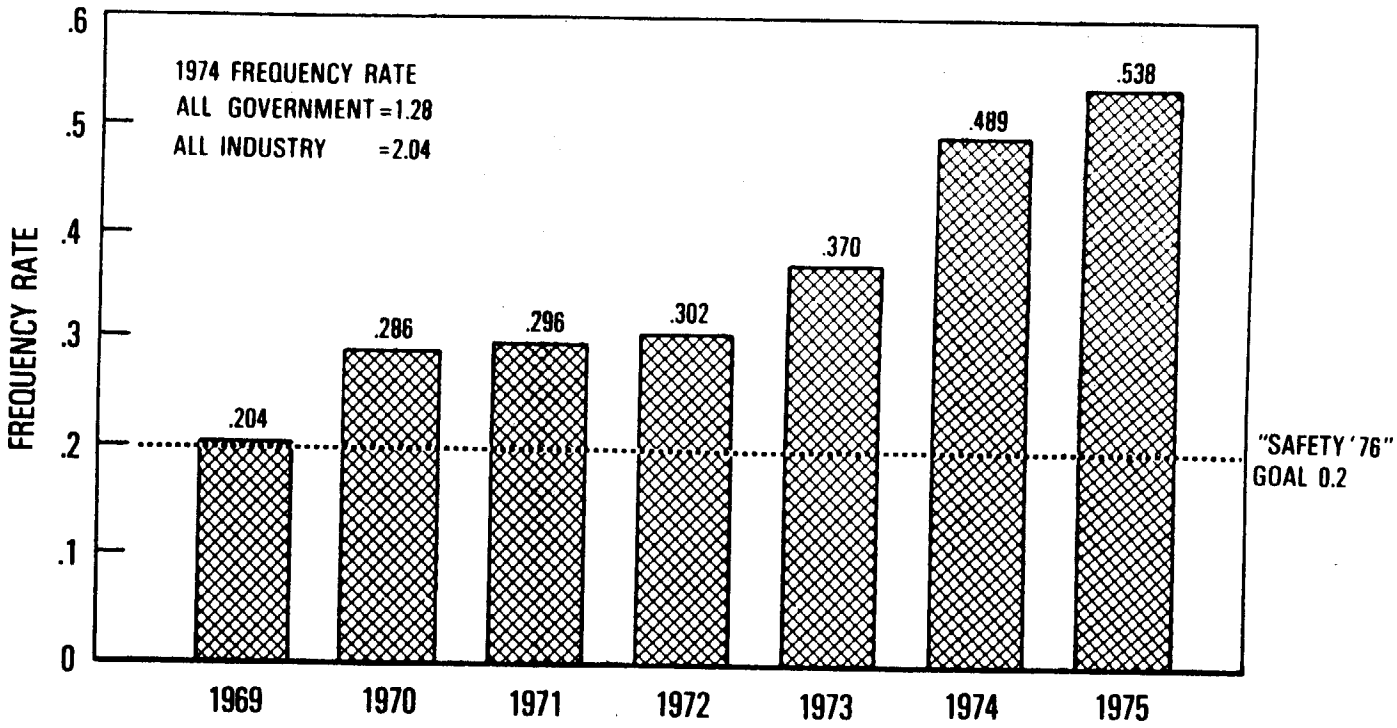
NASA INJURY FREQUENCY RATE 1969-1975



FREQUENCY RATE IS THE NUMBER OF LOST TIME INJURIES PER 200,000 MAN-HOURS WORKED.

NASA HQ Y-Z76-2593(1)
3-11-76

1975 NASA INJURY FREQUENCY RATE
NUMBER OF DISABLING (LOST TIME) INJURIES
PER 200,000 MAN-HOURS WORKED

	1975	AVERAGE OF 1969-1974
AMES RESEARCH CENTER	.57	.47
DRYDEN FLIGHT RESEARCH CENTER	.21	.34
GODDARD SPACE FLIGHT CENTER	.44	.34
JOHNSON SPACE CENTER	.06	.39
KENNEDY SPACE CENTER	.74	.23
LANGLEY RESEARCH CENTER	.52	.52
LEWIS RESEARCH CENTER	1.26	.31
MARSHALL SPACE FLIGHT CENTER	.62	.25
MICHOUD ASSEMBLY FACILITY	0	Not Available
NATIONAL SPACE TECH. LAB.	0	Not Available
NASA PASADENA OFFICE	0	Not Available
WALLOPS FLIGHT CENTER	0	.28
HEADQUARTERS	.29	.08
NASA (TOTAL)	.54	.32

NASA HQ YZ76-3078 (1)
4-30-76

PROBABILITIES OF BEING INJURED IN NASA ON-THE-JOB IN 1975 VS 1974

	TOTAL OF LOST AND NON-LOST TIME INJURIES	AVERAGE NUMBER OF EMPLOYEES	CHANCES OF BEING INJURED IN 1975	CHANCES OF BEING INJURED IN 1974
MAF	0	33	0	0
NSTL	0	68	0	0
WFC	0	437	0	1 IN 55.2
NAPO	0	35	0	1 IN 37.0
JSC	16	3997	1 IN 249.8	1 IN 192.1
MSFC	41	4444	1 IN 108.4	1 IN 91.4
GSFC	39	3889	1 IN 99.7	1 IN 16.4
KSC	28	2366	1 IN 84.5	1 IN 77.0
HQ	25	1680	1 IN 67.2	1 IN 583.3
DFRC	16	547	1 IN 34.2	1 IN 29.9
LARC	181	3520	1 IN 23.8	1 IN 27.8
LERC	148	3150	1 IN 21.3	1 IN 26.9
ARC	256	1857	1 IN 7.3	1 IN 7.4
NASA (TOTAL)	750	26023	1 IN 34.7	1 IN 30.9

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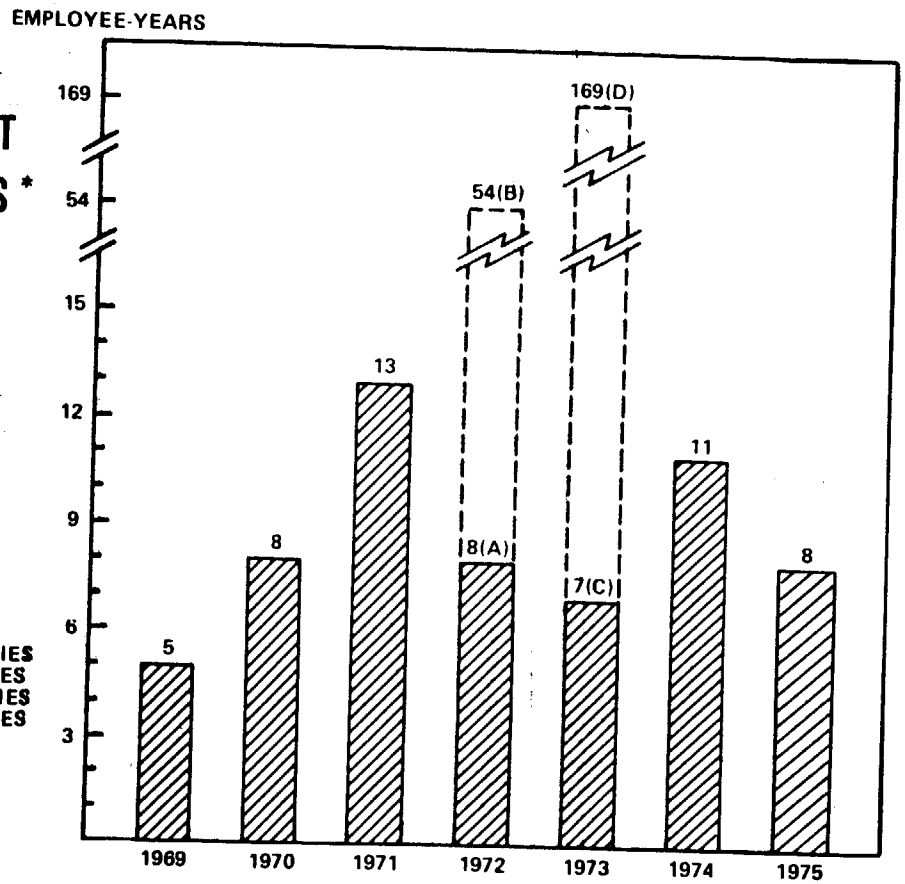
REV.6 14-76

NASA EMPLOYEE-YEARS LOST DUE TO ON-THE-JOB INJURIES *



NOTES:

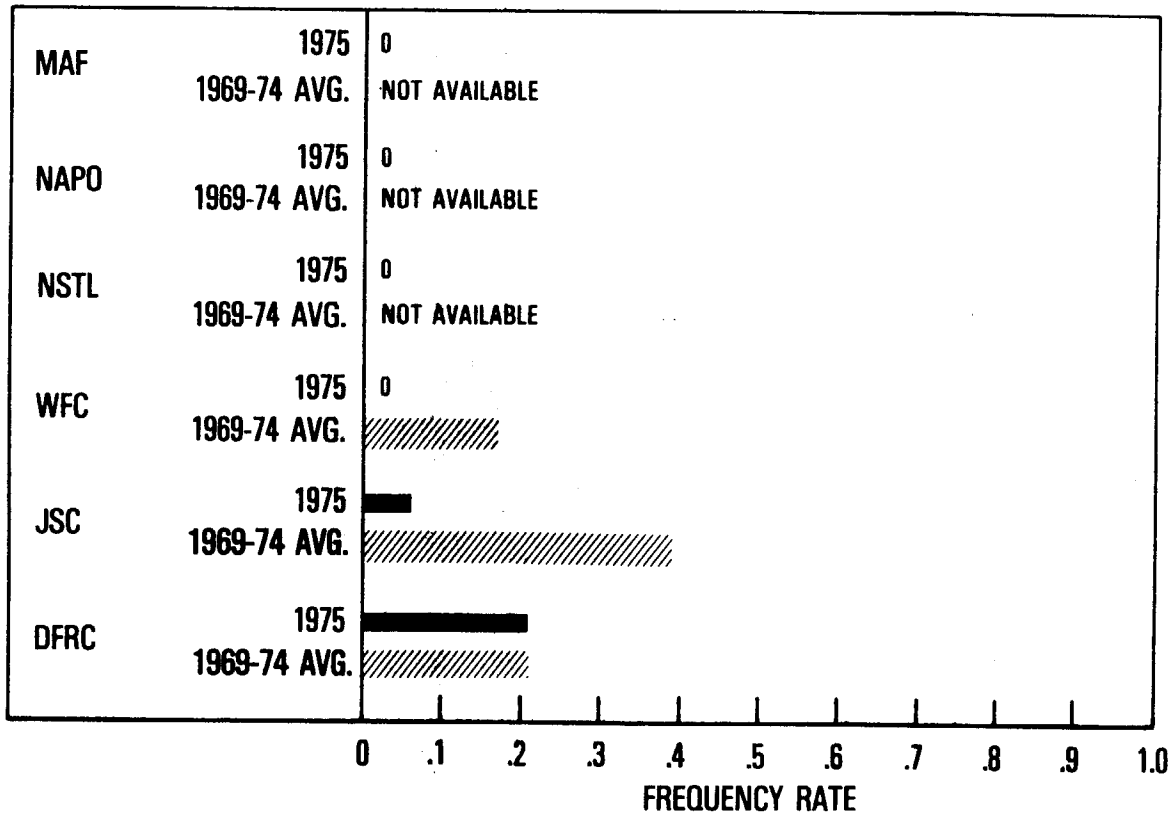
(A) 1972 DATA EXCLUDING THE 2 FATALITIES
(B) 1972 DATA INCLUDING THE 2 FATALITIES
(C) 1973 DATA EXCLUDING THE 7 FATALITIES
(D) 1973 DATA INCLUDING THE 7 FATALITIES

* 260 WORK DAYS = 1 EMPLOYEE-YEAR
EACH FATALITY CAUSES LOSS
OF 6,000 WORK DAYS

NASA HQ YZ76 3093 (1)
5 3 76

NASA INJURY FREQUENCY RATES

INSTALLATIONS WHICH ACCOMPLISHED THE "SAFETY '76" GOAL OF 0.2

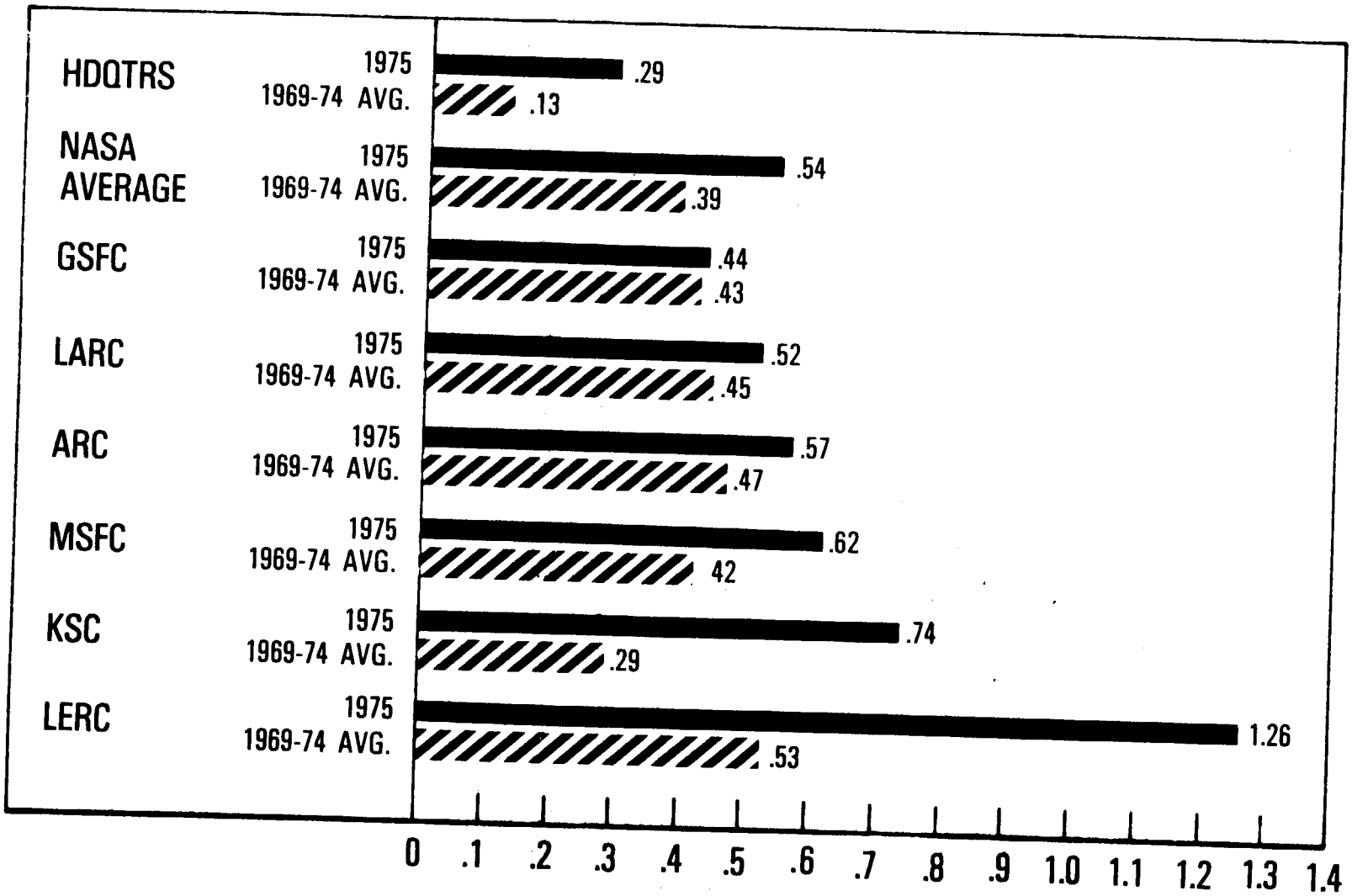


FREQUENCY RATE IS THE NUMBER OF LOST TIME INJURIES PER 200,000 MAN-HOURS WORKED.

NASA HQ YZ76 2584 (1)
(Rev 11-5-3-76)

NASA INJURY FREQUENCY RATES

INSTALLATIONS WHICH DID NOT ACCOMPLISH THE "SAFETY '76" GOAL OF 0.2



NASA HQ YZ76-2592(1)
3-11-76

3-11-76

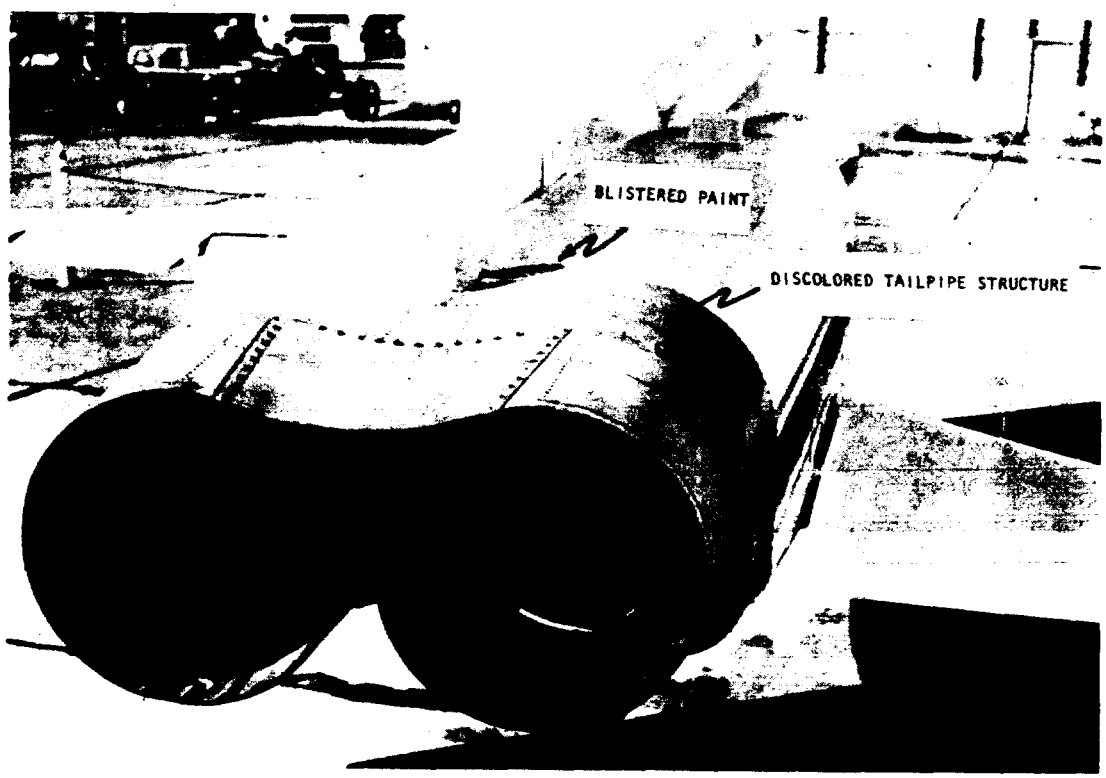
NASA AVIATION ACCIDENT/INCIDENT EXPERIENCE IN 1975

SUMMARY: NASA's aviators and ground support personnel have given us an excellent year. In 1975, we have had no fatalities, no Type "A" accidents, no aircraft destroyed, only one Type "B" accident, and two incidents.

Unfortunately there were several ground incidents, for example, a trucker clipping the empennage of an aircraft. While not classed as flight mishaps, ground incidents are often quite costly.

NASA aircraft flew 23,006 hours in 1975 and the cost of mishaps was $92,273. The one significant accident was an in-flight fire observed shortly after take off and the emergency actions taken by tower personnel in alerting the pilot, crash crews and civil fire fighters were most commendable.

RECOMMENDATIONS: Keep up the good work and continue to improve our safety record. It should be reiterated, because of a mishap that occurred this year, that emergency procedures and training have to be constantly reviewed and rehearsed on the ground to keep pilots up to date on correct actions to take in flight.



T-38 Aircraft - Minor Topside Burns from Inflight Fire

AVIATION FLIGHT MISHAPS

	1969	1970	1971	1972	1973	1974	1975
TYPE A	5	0	2	2	2	1	0
TYPE B	0	0	0	1	2	1	1
INCIDENTS	2	5	6	2	10	3	2
AIRCRAFT DESTROYED	4	0	2	2	2	1	0
PILOT/CREW FATALITIES	0	0	0	2	11	0	0

AVIATION FLIGHT ACCIDENTS RATES - NO. OF ACCIDENTS PER 100,000 HOURS

FLIGHT ACCIDENT RATE	20	0	4	11	14	9	4
FATAL ACCIDENT RATE	0	0	0	7	4	0	0
AIRCRAFT DESTROYED RATE	15	0	4	7	7	4	0

FLIGHT ACCIDENTS SUMMARY

CATEGORY OF AIRCRAFT

PROGRAM SUPPORT	1	0	0	0	0	1	0
ADMINISTRATIVE	1	0	0	0	0	0	0
SPACE FLIGHT READINESS & PROFICIENCY	2	0	2	2	1	1	1
R&D	1	0	0	1	3	0	0

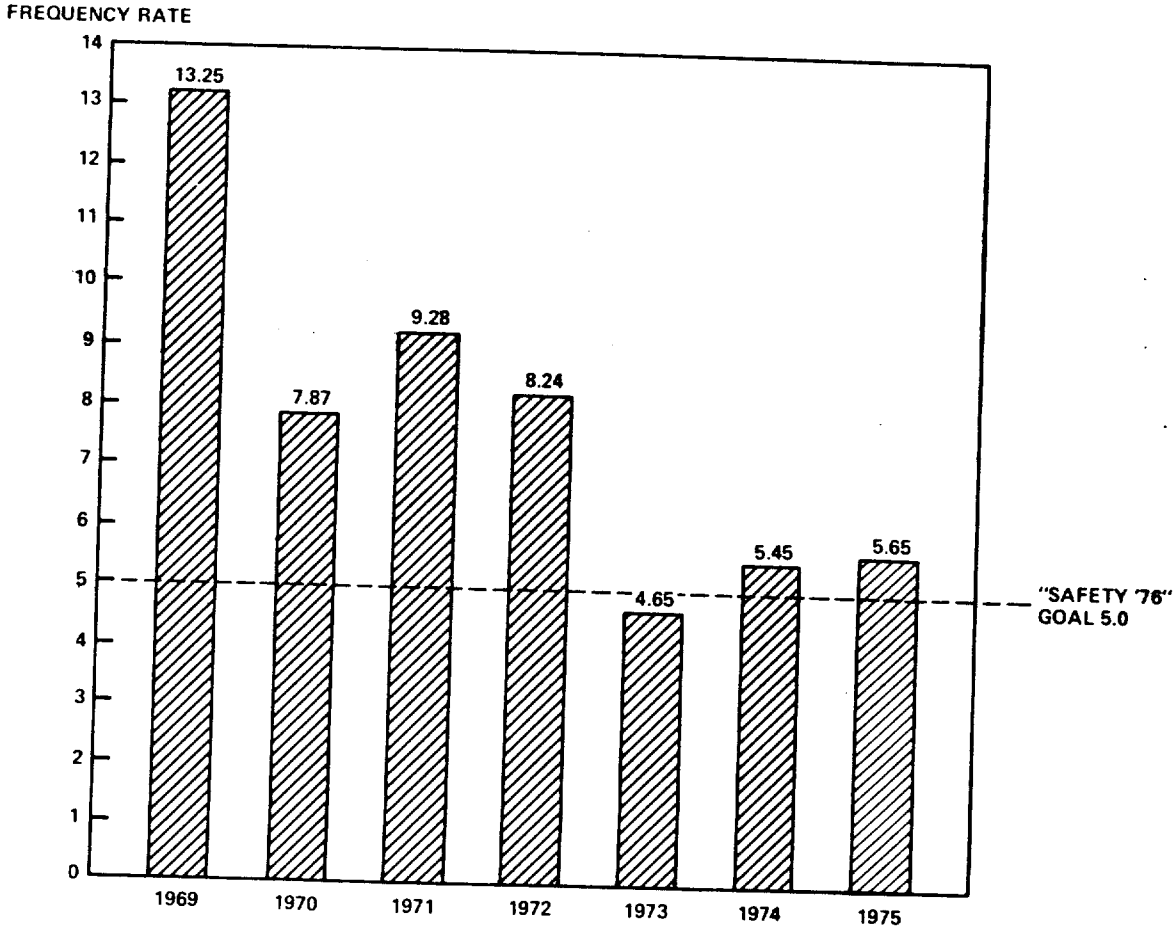
Underside of T-38 Boat Tail Showing Results of Fire Noted After Take Off

ANALYSIS: It is significant that all three fatalities which involved NASA personnel or equipment this year took place in motor vehicle accidents. Fortunately, no NASA employees were at fault. Unfortunately, our frequency rate went up slightly and so did the costs of repairs. Government vehicular mileage decreased slightly from last year but privately owned vehicle mileage shows a considerable increase - probably due to installations which heretofore had not been reporting cost reimbursable mileage.

RECOMMENDATIONS: Re-emphasize defensive driver training, encourage adherence to speed limits and promote increased usage of seat belts and shoulder harnesses.

P.S. Drive Carefully!!

NASA GOVERNMENT MOTOR VEHICLE ACCIDENTS



FREQUENCY RATE IS THE NUMBER OF MOTOR VEHICLE ACCIDENTS PER MILLION MILES DRIVEN.

NASA HQ YZ'76 3091
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NASA 1975 MOTOR VEHICLE ACCIDENTS

Field Installations	No. of Accidents Govt.	Private	Total Miles Driven (in thousands) Govt.	Private	Total Cost Govt.	Private	Frequency Rate* of Accidents Govt.	Private
AMES	0	0	675	599	0	0	0	0
DRYDEN	0	0	263	174	0	0	0	0
GODDARD	22	0	3738	1422	$9823	0	5.9	0
JOHNSON	0	0	325	966	0	0	0	0
KENNEDY	2	3	786	726	2744	248	2.5	4.13
LANGLEY	8	0	438	1611	1614	0	18.3	0
LEWIS	14	4	721	0	3336	0	19.4	0
MARSHALL	6	0	1689	854	999	0	3.5	0
MICHOUD	NOT AVAILABLE							
NSTL	NOT AVAILABLE							
NAPO	0	0		16	0	0	0	0
WALLOPS	1	0	603	0	600	0	1.7	0
HEADQUARTERS	0	0	101	214	0	0	0	0
NASA (TOTAL)	53	7	9339	6582	$19116	248	5.7	1.1

* FREQUENCY RATE IS THE NUMBER OF ACCIDENTS PER MILLION MILES DRIVEN

NASA FIRE EXPERIENCE IN 1975

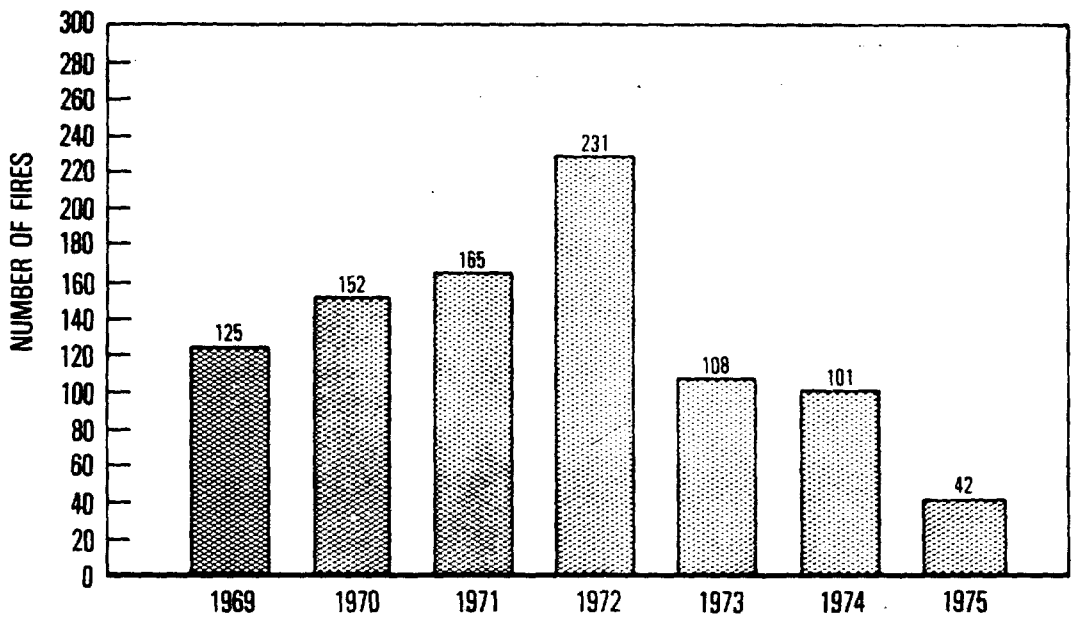
Despite a significant (greater than 50%) reduction in the number of reported fires in 1975, the monetary losses were the third highest in the agency's history.

This reduction in the number of fires is a direct reflection of the extensive fire prevention programs being conducted. Inspections, training, design criteria, and construction reviews, and the many year-round prevention activities engaged in are proving their effectiveness.

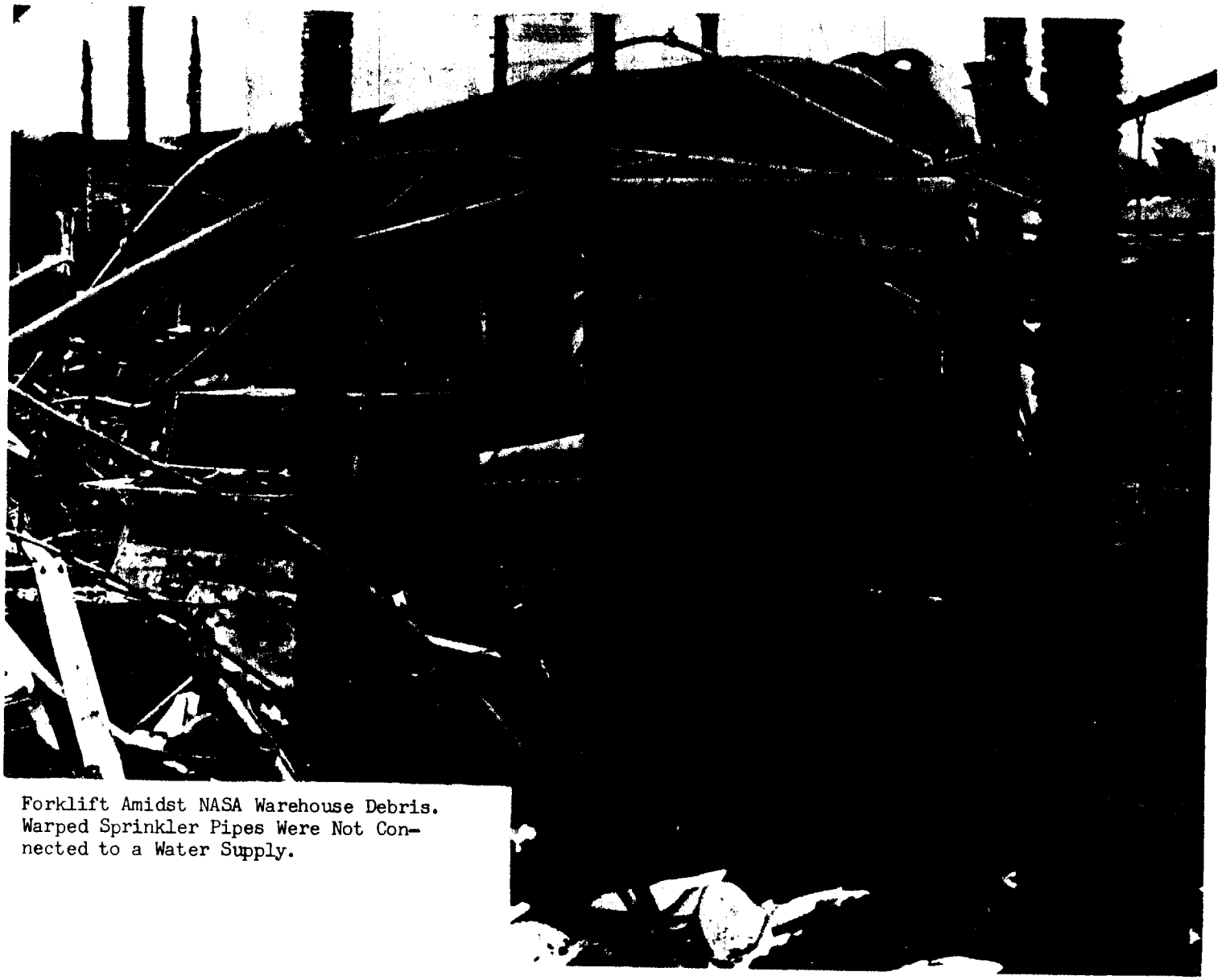
While extensive improvements are being made by providing adequate fire detection and suppression in facilities, many areas still lack these systems. The major losses (nearly 100%) occurred in facilities that were either not so protected or the systems were inoperative. Only the combined efforts of continued prevention programs and installation of automatic protection and detection systems will reduce these losses to an acceptable minimum.

Balanced risk surveys which identify the loss potential of areas and facilities will provide insight into the equipment needs and enable development of justification necessary to seek appropriate funding.

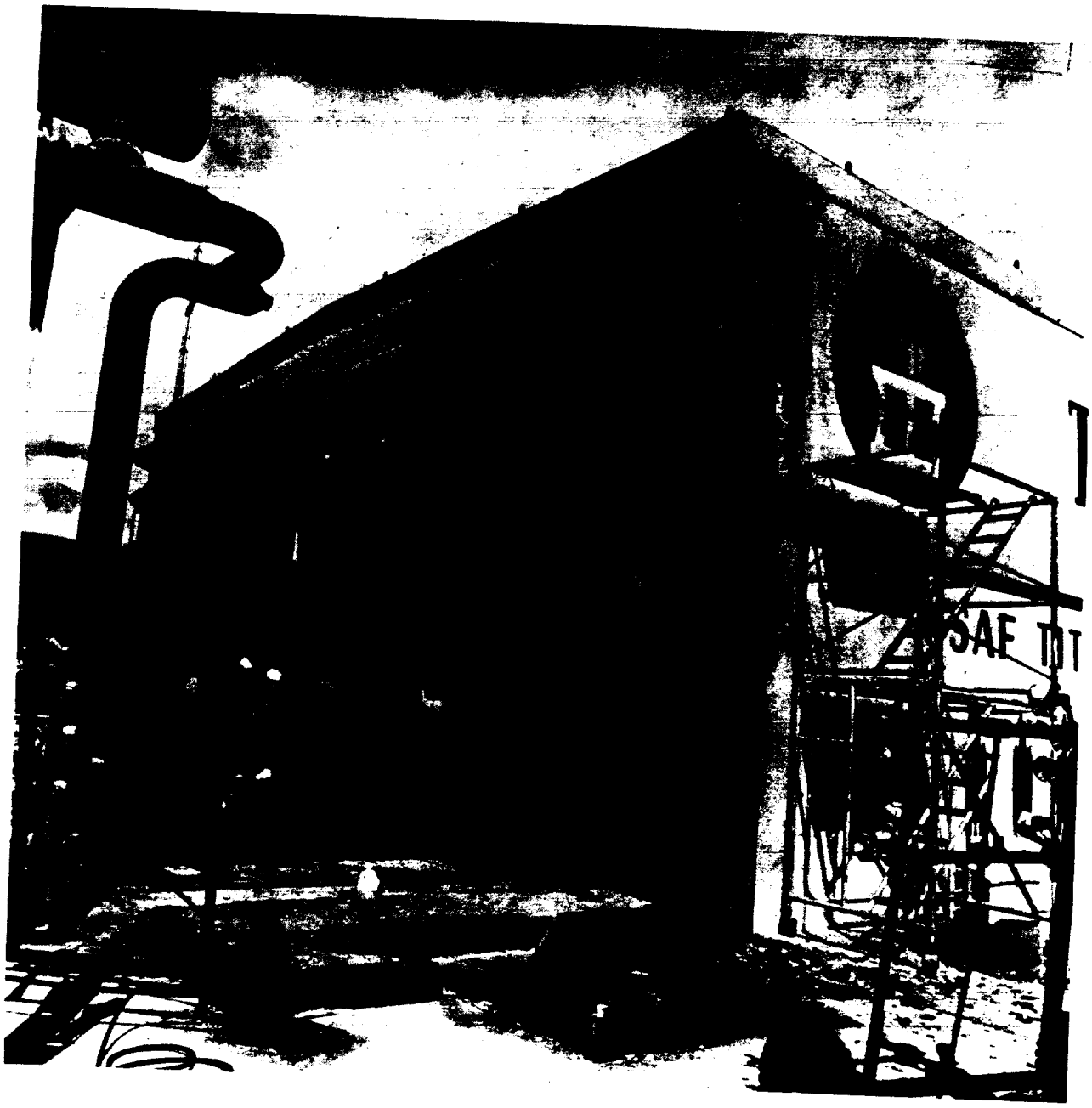
NUMBER OF NASA FIRE MISHAPS



NASA HQ YZ76-2594(1)
3-11-76

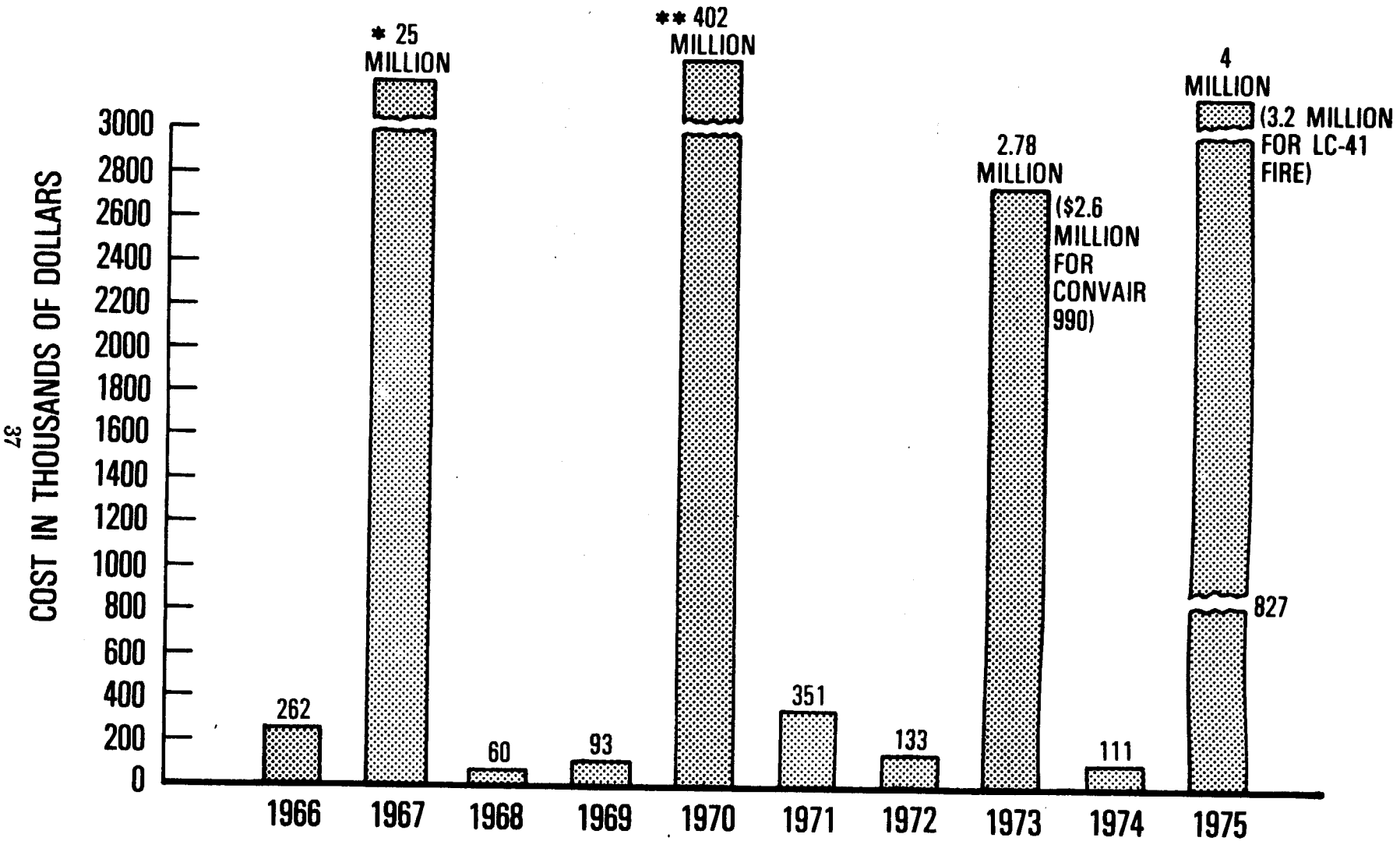


Forklift Amidst NASA Warehouse Debris. Warped Sprinkler Pipes Were Not Connected to a Water Supply.



Fire Damage Sustained After Launch Exhaust Ignited Ground Cabling

COST TO NASA FOR FIRE MISHAPS



* HIGH COSTS DUE TO APOLLO 204 FIRE WHICH KILLED THREE ASTRONAUTS.

** EXCEEDINGLY HIGH COSTS WERE DUE TO APOLLO 13 LOX EXPLOSION ON THE WAY TO THE MOON.

NASA HQ YZ76-2583(1)
3-11-76

NASA Warehouse Burned Down Across the Street From an Army Fire Station

TYPES OF INJURIES
1975

Not all lost time injuries were summarized and submitted to Headquarters. Only 55 injury briefs with the number of days lost were received, but 127 lost time injuries were reported to OSHA.

	Number	Days Lost
Falls	13	104
Slips	11	76
Muscle Strains	10	90
Lacerations, contusions	9	75
Hernias	4	122
Exposure to irritants	3	26
Other	5	56
TOTAL	55	549

LOST TIME INJURY BRIEFS

1975

INJURY	DAYS LOST
While sawing aluminum disc with metal band saw, cut right thumb.	1 day
Slipped on ice while getting out of automobile, resulting in injury to face and lacerations and abrasions to the right temple area.	1 day
Pulmonary allergic response (asthmatic bronchitis) brought on by or significantly aggravated by exposure to aerosols. Following a thorough history and evaluation of the work place, it was determined that in all likelihood, the employee has a hypersensitivity to various aerosol sprays which are used on the job. Exposure to those sprays produced symptoms of a hypersensitive or allergic nature which was disabling.	7 days
Employee was sitting on a standard laboratory type stool with adjustable back rest. The back rest came loose, causing the employee to fall to the floor resulting in a discomfort (contusion) of the lower spine.	1 day
Employee inhaled sodium hydroxide (Na OH) vapors while performing routine custodial services in a building hallway. The vapors originated from an adjacent laboratory. The source of the vapor was a cleaning solution located in a laminated flow hood. The exhaust fan switch had been turned off to accomplish some work on the exhaust duct system. When the work was completed, the switch was not returned to the "on" position. This resulted in irritation of the eyes and respiratory tract.	At least 16 days
Employee was standing at the six foot level on a ten foot wooden step ladder repositioning a light fixture. A piece of ceiling hardware came loose, causing the fixture to fall. This resulted in the employee also falling and striking an extension ladder which was lying on the floor. Fracture of five ribs, injury to right hip socket, and right shoulder.	At least 7 days
Eye irritation.	3 days
Fractured ankle.	10 days
Employee closed a table drawer on thumb, chipping bone, shortening tendon and causing scar tissue to form.	3 days

Employee was standing on the six foot level of a ten foot ladder. He had one foot on ladder and one foot on door - attempting to free the door. He did, fell, and broke two ribs and bruised his chest.	30 days
Employee working on scaffold 8 to 10 feet above ground fell as he was climbing down and a plank dislodged. Injured right knee.	12 days
Contusions of torso.	21 days
Employee walking down stairs slipped and twisted back.	14 days
Employee's vehicle hit by drunken contractor.	23 days
As employee bent over to install a bracket on an instrument, felt a shrp pain in his back, fell to floor and could not get up.	18 days
Old knee injury had to be operated on again.	9 days
Employee standing on chair to hang picture, lost balance, fell and landed on sacrum, fracturing coccyx.	3 days
Hernia repair.	24 days
Employee playing volleyball strained right ankle.	1 day
Small chip ricocheted from piece of plexiglass into employee's eye. Possible corneal abrasion.	11 days
Lacerated left forefinger caused when hand was pinned between drill press and repositioning table.	14 days
Employee jumped from loading dock to driveway four feet below and sprained left foot.	10 days
Employee fainted, fell, and struck head on cabinet.	1 day
Employee climbing down from tank fell against pipe causing contusion to right kidney area.	11 days
While transferring a file weighing approximately 2-3 lbs. from cabinet to desk, employee felt a pain. Possible sprain of left wrist.	19 days
Employee fractured left forearm while stripping and waxing floors.	1 day
Contusion of right heel resulted when employee stepped off a two foot railing onto concrete floor.	3 days

While moving boxes, one fell. Employee attempted to catch it and suffered a sprain in left scapula area.	2 days
On-base car accident aggravated low back syndrome.	13 days
While lifting the end of a conduit, it struck employee on the nose.	15 days
Back strain was caused by installing a sting on some testing apparatus.	9 days
Turned ankle while stepping to a slightly lower level causing fracture.	9 days
Slipped and fell to floor, straining lower back.	9 days
Bumped elbow on metal box causing contusion.	9 days
Employee walking from elevator heard his phone ring. He rushed to the office, tripped over a loose floor utility access cover plate, fell, fractured jaw and lacerated chin and lips.	6 days
Employee slipped on floor during re-modeling.	7 days
Contusion of the groin suffered when employee lost footing and slipped while opening a test section pod door.	8 days
Slipped, strained lower back	13 days
Employee pulling on pump lever to engage it. Suffered muscle strain in back.	9 days
Hernia, unrepaired until surgery.	50 days
Tripped on rug at building entrance; contusion left ankle	7 days
Vehicle accident caused neck and back strain.	4 days
Struck in left eye during fisticuffs; lacerated.	7 days
Employee suffered a back injury while replacing a 50 h.p. motor in a confined space.	3 days
When employee bent to pick up a brass drift and hammer, he suffered a back injury.	2 days
A clerk stepping off a shuttle bus twisted right ankle.	4 days
Foot slipped and employee fell down stairs.	1 day

A secretary underwent prolonged periods of sitting and typing. Suffered muscle spasms in upper, middle, and lower back.	23 days
Hernia repair.	26 days
While moving a file cabinet, it fell off dolly causing contusions and abrasions to right foot.	1 day
While pulling pod door open, employee's feet slipped in oil causing steel door to strike him in groin.	10 days
Employee slipped and fell on wet floor, fracturing left arm.	10 days
Employee slipped on wet floor, hit head.	2 days
Employee suffered a hernia while placing metal in storage rack	22 days
While moving an empty file cabinet on a dolly, it slipped and landed on right foot.	4 days