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Injuries in Oil and Gas Drilling and Services

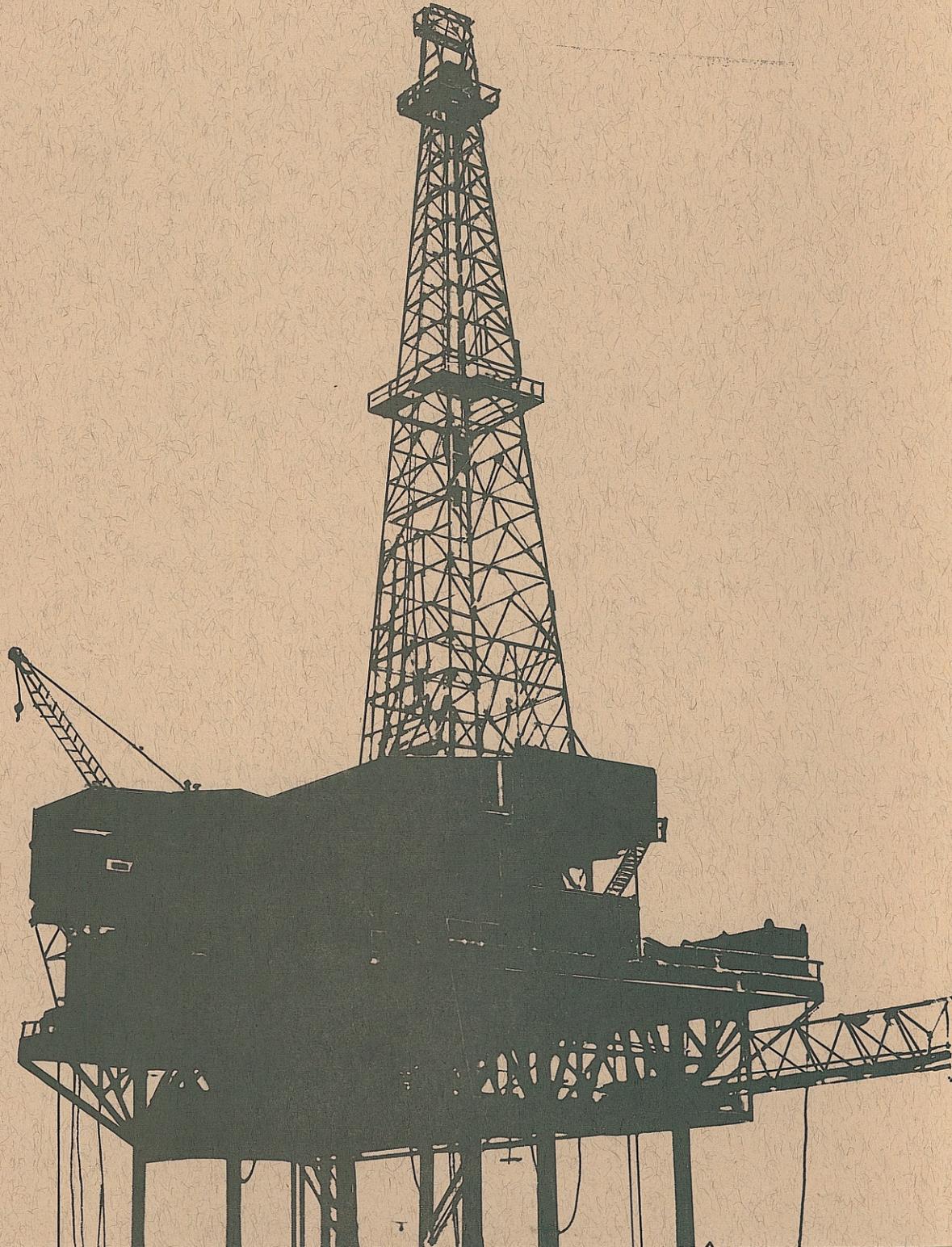


U.S. Department of Labor
Bureau of Labor Statistics
August 1983

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Bulletin 2179

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Injuries in Oil and Gas Drilling and Services



U.S. Department of Labor
Raymond J. Donovan, Secretary
Bureau of Labor Statistics
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Bulletin 2179

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Preface

This bulletin summarizes the results of a survey of workers who were injured performing well-drilling and servicing activities during the period from May through August of 1982. The findings will assist the Occupational Safety and Health Administration (OSHA) in developing safety standards, compliance strategy, and training programs for reducing work-related injuries.

The survey was conducted by the Bureau's Office of Occupational Safety and Health Statistics, William Mead, Associate Commissioner, in cooperation with the Department of Labor's Office of Workers' Compensation Programs, and the following States: Alaska, California, Colorado, Kentucky, Montana, New Mexico, Oklahoma, Ohio, Tennessee, Texas, Utah, and Wyoming. The BLS regional offices coordinated State operations and the Dallas office collected data for offshore drilling and servicing operations in the Gulf of Mexico. The Offices of Compliance, Standards Development, Statistical Studies and Analysis, and Training of OSHA and the Office of Safety Research of the National Institute for Occupational Safety and Health contributed to the planning and development of the survey. Maryrose Cline-Buso developed the questionnaire and editing program and assisted in the survey planning and analysis of the survey findings. Lyn

Pearson developed the computer programs. The survey was directed by Helen McDonald under the supervision of Herbert Schaffer. We wish to acknowledge the contribution of Ron Baker, of the Petroleum Extension Service of the University of Texas at Austin, who provided valuable technical information and assistance.

The data collected in the survey are valid for understanding how and why injuries occurred among the workers studied. However, the user should exercise caution in extrapolating the data to population estimates because of limitations of the survey. States participating in data collection may not represent the country as a whole; reporting requirements for workers' compensation reports, which are the source for selecting injuries for study, vary among States; and the data collection period is not intended to represent the entire year.

For analytical purposes, incidence rates of the injuries studied were not generated nor can they be inferred from the data because information on hours of work during the survey period is not available. See appendix A for scope and methodology of the survey.

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Contents

	<i>Page</i>
Summary	1
Tables:	
Injuries in oil and gas drilling and services, selected States, May-August 1982:	
1. Industry classification	4
2. Occupation and length of service	4
3. Worker activity	5
4. Location of worker	6
5. Source of injury	7
6. Events leading to the accident	8
7. Type of accident	9
8. Selected types of accidents in detail	10
9. Type of accident by events leading to the accident	12
10. Falls from elevations	12
11. Estimated days away from work	13
12. Length of hospitalization required	13
13. Nature of injury	14
14. Part of body affected	14
15. Age and sex of worker	15
16. Training	16
17. Protective equipment	17
18. Conditions or factors contributing to accident	17
Appendixes:	
A. Survey explanatory note	19
B. Participating State agencies	21
C. Survey questionnaire	22

Injuries in Oil and Gas Drilling and Services

Summary

The Bureau of Labor Statistics conducted a survey of injuries to workers directly involved with the drilling and servicing of oil and gas wells during the period from May through August 1982.¹ These operations are subject to a variety of working conditions which are potentially hazardous. Drilling is often continuous, requiring three shifts or tours daily, 7 days a week. The rig floor is frequently slippery from drill fluid, and floor space is limited. Drill pipes, tubing, tongs, and elevators are heavy and cumbersome. Teamwork is essential in many of the activities. Crews are exposed to adverse weather conditions ranging from subzero cold to heat soaring over 100 degrees, as well as snowstorms and hurricanes.

The potential high risk of injury is reflected in the injury incidence rate for oil and gas field services, in which 89 percent of the workers are employed in drilling oil and gas wells and providing field services.² The industry injury rate per 100 workers was 19.4 in 1981, more than twice the rate of 8.1 for all industries.³ Similarly, the lost workday rate for injuries was 197.3, more than three times the equivalent rate of 60.4 for all industries.

The Bureau's survey of approximately 1,000 injured workers showed that nearly two-thirds were involved with drilling operations and the remainder in well services (table 1). Floorhands, also called roughnecks or rotary helpers, were injured more frequently than workers in any of the other occupations studied, accounting for about one-half of the injured workers (table 2). While floorhands in both drilling and services experienced more injuries than any of the other occupations shown in text table 1, the occupational mix of the other injured workers varied due to differences in the nature of their work. For example, servicing included such diverse activities as acidizing, bailing, cementing, chemically treating, cleaning, and swabbing wells. Thus, well-servicing equipment operators and roustabouts ranked high as hazardous occupations in services, while derrickmen, motormen, and drillers ranked similarly in drilling.

¹ See appendix A for scope of survey.

² *County Business Patterns, 1978*, CPB-78-1 (Bureau of the Census, 1981), table 1B, pp. 5-6.

³ *Occupational Injuries and Illnesses in the United States by Industry, 1981*, Bulletin 2164 (Bureau of Labor Statistics, 1983), table 4.

Text table 1. Occupation and operation

(Percent of injured workers)

Occupation	Drilling	Services
Total	100	100
Derrickman	20	11
Driller	10	-
Motorman or electrician	12	2
Roughneck, floorhand, or rotary helper ...	50	46
Roustabout or laborer	3	14
Well servicing equipment operator	-	20
Other	5	7

- Indicates no data were reported.

The activity most frequently being performed by injured workers at the time of the accident was pulling the drill stem out of or lowering it into the wellbore (22 percent), referred to in the industry as "tripping out or in" (table 3). Half as many workers, 11 percent, were pulling or removing rods or tubing. From 7 to 9 percent were adding a joint; handling materials; repairing or servicing pumps, engines, generators, and motors; and maintaining and repairing other equipment or part of the rig structure. As shown in text table 2, the activities at the time of the accident, like occupations, differed between drilling and servicing. Workers involved in drilling were primarily tripping out or in, adding a joint, or setting up rig or rigging down; while those in servicing were pulling rods or tubing or handling material at the time of the accident.

Text table 2. Activity at time of accident by type of operation

(Percent of injured workers)

Occupation	Drilling	Services
Total	100	100
Adding a joint	12	4
Casing	3	6
Manual or mechanical materials' handling	7	13
Mixing or working with mud or other drilling fluids	5	-
Pulling rods or tubing	-	29
Repairing or servicing pumps, engines, generators, or other motors	8	5
Repairing, cleaning, or servicing other equipment, work materials, or rig structure	9	4
Setting up, installing, or dismantling equipment or machinery	4	8
Setting up rig or rigging down	11	6
Tripping out or in	32	5
Other	9	20

- Indicates no data were reported.

Inherent to activities were the equipment or work materials being used or handled at the time of the accident. More than one-third of the injured workers were working with pipes, tubing, or related objects (table 3). Nearly one-fifth were working with some part of the hoisting apparatus, and one-fourth of the workers were using either tongs or handtools, such as wrenches or hammers.

At the time of the accident, more than two-fifths of the injured were working on the rig floor or the rotary table (table 4). Nearly one-fourth of the workers were at ground level. Numerous other locations on or near the rig were identified, but by smaller numbers of workers. For example, from 2 to 4 percent of the accidents occurred on catwalks, derricks, monkeyboards, mud pits, pipe racks, stairs or ladders, or walkways.

The accident profile continues taking shape in examining the sources of injury, that is the object, substance, exposure, or bodily motion which directly produced or inflicted the injury (table 5). Structures and working surfaces; pipes, tubing, and related objects; and breakout or makeup equipment were the most common general categories of sources cited, 19, 17, and 14 percent, respectively. Focusing on specific sources, tongs produced more injuries than any other equipment (10 percent), followed by nonpowered handtools, mostly wrenches and hammers (7 percent). Other sources noted, but less frequently, were the ground (6 percent) and drill pipes (5 percent).

Accidents were often described by injured workers as a series of unusual or unexpected events rather than a single, isolated event. For example, the brakes on the drawworks broke, causing the block to fall. The block struck the worker who, subsequently, fell from the rig floor. In classifying such events, unexpected or sudden shifting or slipping of equipment or work materials was described more frequently than any other event (table 6). Ranking next in frequency were workers slipping or tripping, and equipment or work materials falling or breaking.

The significance of the source of injury and events leading to the injury become evident when linked to the event directly producing the injury, also referred to as the type of accident. More than two-fifths of the workers were injured as a direct result of being struck by objects, which was the predominant type of accident reported (table 7). Objects were identified as pipes, tubing, and related items (26 percent); breakout or makeup equipment, usually tongs (20 percent); and nonpowered handtools, mostly wrenches and hammers (14 percent) (table 8). All but 20 percent of the workers struck by objects described at least one preceding event. Equipment or work materials shifted or slipped unexpectedly in 56 percent of the cases and fell or broke in 27 percent of the cases (table 9).

Falls from elevations resulted in one-tenth of the injuries. Nearly three-fourths of the workers fell from

structures, usually the rig floor (25 percent), or stairs, steps, or ladders (21 percent). More than one-half of the workers fell at least 5 feet, and over one-fourth, 10 feet or more (table 10). Almost two-thirds of the workers who fell from elevations indicated one or more preceding events. Workers slipping or tripping led to 27 percent of the falls; equipment or work materials shifting or slipping unexpectedly, 20 percent; workers struck by an object, 12 percent; and equipment or work material breaking, 11 percent.

About one-tenth of the injuries resulted from a body part, usually the hands, being pinched, squeezed, or caught in or between objects. The most common sources of these injuries were breakout or makeup equipment, mostly tongs (32 percent); multiple objects, such as winch cable and pulley, elevator and slips, elevator and bail (27 percent); and hoisting apparatus (13 percent). More than one-half of these types of accidents were accompanied by preceding events. Unexpected shifting or slipping of equipment or work materials accounted for 34 percent of the events; being struck by an object, 10 percent; and equipment malfunctioning or jamming, 9 percent.

Overexertion while lifting, handling, or using objects accounted for slightly more than one-tenth of the injuries. The major objects identified were pipes, tubing, or related objects (41 percent); miscellaneous objects such as barrels, kegs, ropes, chains, etc. (15 percent); and breakout or makeup equipment, mostly slips or tongs (13 percent). Unlike the other types of accidents described above, overexertion injuries were, for the most part, not precipitated by a preceding event.

Injuries tended to be severe, often resulting in lost time and, to a lesser extent, hospitalization. Seven out of ten workers responding to the survey reported 1 or more days away from work because of their injuries (table 11). Of the workers who reported the number of days lost, almost 3 out of 4 lost more than 5 days, and about 3 out of 10 lost more than 30 days. The average lost-time case resulted in an estimated 26 days away from work, which exceeded the 1981 national average for all industries by 10 days.⁴ The lost-time average of 29 days for workers in drilling operations was 5 days higher than that in servicing operations.

Slightly more than one-fifth of the workers indicated that they were hospitalized at least 1 night as a result of their injuries (table 12). Of the workers who reported the number of nights hospitalized, nearly 9 out of 10 stayed more than 1 night and almost 1 out of 4 stayed at least 9 nights. The average hospital stay was 7 nights.

Muscle sprains or strains were experienced by one-third of the workers studied, which approximated the proportion found in all industries.⁵ Fractures, cuts, and

⁴ Ibid.

⁵ Supplementary Data System, 1980. Unpublished data (Bureau of Labor Statistics, 1980). Eighteen States supplied cases involving disability.

bruises were about equally reported by nearly three-fourths of the workers (table 13). The proportion of fractures in this survey was three times that in all industries. Amputations accounted for 4 percent of the injuries, more than five times the percent in all industries.

Upper extremity and head injuries were proportionately higher for workers responding to the survey than for those in all industries. Back injuries were proportionately lower and lower extremity injuries were about the same for both groups.⁶ Upper extremity injuries, mostly to fingers, were suffered by one-third of the workers (table 14). Trunk injuries, usually in the back, were experienced by almost one-fourth of the workers; lower extremity injuries, by about one-fifth; and head injuries, by more than one-tenth.

Apart from the risk factors associated with the nature of the work and events linked to the injury, other factors may have contributed to the accident. According to a *Monthly Labor Review* article, "...occupational injuries occur at a lower rate to older workers than to younger ones."⁷ The survey of oil and gas well drilling and servicing injuries showed that most of the workers injured were in the younger age groups: About 3 out of 8 were under 25 and a similar ratio were concentrated in the 25- to 34-year age group (table 15). Together, they exceeded the under 35 group of injured workers in all industries by about one-fourth.⁸

Length of service is often related to age. Injuries are likely to occur in the first year of employment.⁹ Seventenths of the workers studied were employed less than 1 year in the job when injured (table 2). Of these, 2 out of 3 were employed less than 6 months, and 1 out of 4, less than 1 month. Furthermore, fewer than one-half of the workers indicated that they normally performed the activity at which they were injured on a daily basis (table 3). Almost two-fifths reported performing the activity several times or about once a month, and most of the remaining workers, less than once a month.

Another BLS study showed that workers in unskilled-labor-type jobs "... had injuries at a level almost four times the average while operatives and craftworkers incurred injuries at about one and a half times the

⁶ Ibid.

⁷ Norman Root, "Injuries at Work Are Fewer Among Older Workers," *Monthly Labor Review*, March 1981, pp. 30-34.

⁸ Supplementary Data System, 1980.

⁹ Norman Root, "Injuries at Work Are Fewer Among Older Workers."

normal."¹⁰ Virtually all of the workers covered by the survey were in the more hazardous unskilled labor groups (table 2).

Safety training is another factor to consider. Most workers reported that safety procedures were covered by their job training (table 16). However, more workers indicated that they had received their training from a previous supervisor or employer rather than from their current ones. Co-workers were another source of training frequently cited. Although on-the-job training was the most prevalent form of safety training indicated, substantial numbers of workers reported that training meetings and classroom instruction were widely used, along with distribution of printed materials. The subjects more commonly covered were the use of personal protective equipment; proper lifting, carrying, or handling methods; the use of a safety belt, lanyard, and lifeline; firefighting and blowout prevention procedures; and first aid.

Personal protective equipment was widely used among the injured workers studied. About nine-tenths of the workers wore steel-toed safety shoes or boots and hard hats, and almost the same proportion wore gloves (table 17). Substantially fewer workers reported wearing safety glasses, goggles, or other eye protection (11 percent).

Finally, workers' perceptions of cause-related factors provided additional insights on why the accident occurred. One-fourth of the workers found fault with the condition of equipment or work materials, usually the weight and bulkiness of the object and, to a lesser extent, improperly secured equipment (table 18). Nearly two-fifths complained about the conditions of the worksite, most frequently slippery surfaces, limited work areas, and poor weather conditions. Other contributing factors reported were more general, reflecting work procedures and human factors. Most frequently reported were: The fast pace of work, the action of a co-worker, not being aware of hazardous conditions, misjudging time or distance needed to avoid injury, and lack of concentration on the job. Although not as frequently cited as the factors noted above, workers complained about working too and, occasionally, three "tours" without relief.

¹⁰ Norman Root and Deborah Sebastian, "BLS Develops Measure of Job Risk by Occupation," *Monthly Labor Review*, October 1981, pp. 26-30.

Table 1. Industry classification: Injuries in oil and gas drilling and services, selected States, May-August 1982

Standard Industrial Classification (SIC)	Number	Percent
Total	1,041	100
Drilling oil and gas wells (SIC 1381)	667	64
Oil and gas field services, n.e.c. (SIC 1389)	374	36

n.e.c. = not elsewhere classified. SOURCE: State workers' compensation reports.
 NOTE: See appendix A for the scope of the survey.

Table 2. Occupation and length of service: Injuries in oil and gas drilling and services, selected States, May-August 1982

Occupation and length of service	Number	Percent
Occupation		
Total	1,041	100
Derrickman	171	16
Driller	67	6
Mechanic, mechanic's helper	9	1
Motorman or electrician	88	8
Roughneck, floorhand, or rotary helper	506	49
Roustabout or laborer.....	73	7
Tool pusher.....	19	2
Welder, welder's helper	13	1
Well-servicing equipment operator.....	73	7
Other	22	2
Length of time employed in job when injured		
Total	1,035	100
Less than 1 month	183	18
1 month to 6 months	296	29
6 months to 1 year	241	23
1 year to 5 years	266	26
5 years or more	49	5

NOTE: Due to rounding, percentages may not add to 100. See appendix A for scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.
 SOURCE: Survey questionnaire.

Table 3. Worker activity: Injuries in oil and gas drilling and services, selected States, May-August 1982

Activity at time of accident	Number	Percent
Type of operation at site		
Total	1,028	100
Drilling	689	67
Well service or workover	339	33
Activity of injured worker		
Total	1,027	100
Adding a joint	94	9
Casing	45	4
Cementing	20	2
Manual or mechanical materials' handling	93	9
Mixing or working with mud or other drilling fluids	36	4
Perforating	2	(¹)
Pulling rods or tubing	108	11
Repairing or servicing pumps, engines, generators, or other motors	69	7
Repairing, cleaning, or servicing other equipment, work materials, or rig structure	76	7
Setting up, installing, or dismantling equipment or machinery	55	5
Setting up rig or rigging down	91	9
Swabbing	11	1
Testing or inspecting equipment or tools	8	1
Tripping out or in	225	22
Well stimulation (using explosives, acid, etc.)	6	1
Well testing, surveying, or logging	24	2
Other activities	64	6
How often worker normally performed this activity		
Total	1,010	100
First time worker did this type of work	40	4
Daily or almost every day	445	44
Several times a month	294	29
About once a month	88	9
Seldom—less than once a month	143	14
Equipment or work material worker was using or handling at time of accident		
Total ²	1,027	(²)
Chemical, drill mud, or other drilling fluid	25	2
Welding or grinding equipment	20	2
Handtool (portable saw, hammer, etc.)	124	12
Packer, fish, or other downhole equipment or tool	39	4
Kelly, kelly bushing, or kelly bushing guard	12	1
Other rotary equipment	11	1
Pipes, collars, tubing, casing, rods, and related objects	356	35

See footnotes at end of table.

Table 3. Worker activity: Injuries in oil and gas drilling and services, selected States, May-August 1982—Continued

Activity at time of accident	Number	Percent
Equipment or work material worker was using or handling at time of accident—Continued		
Elevator, block, swivel, hook, or slips	95	9
Drawworks, cathead, other hoisting apparatus, or their parts	83	8
Tongs	130	13
Rod wrenches	7	1
Breakout or makeup equipment, n.e.c. or uns.	13	1
Pumps, engines, generators, other motors, or their parts	54	5
Blowout preventer	30	3
Machines, equipment, or their parts, n.e.c. or uns.	37	4
Structures or structural pieces	21	2
Barrels, kegs, drums, boxes, crates, cartons, sacks, buckets, etc. ...	30	3
Ropes, chains, cables, hoses, etc., n.e.c. or uns.	21	2
Other	12	1
None	109	11

¹ Less than 0.5 percent.

² Because more than one response is possible, the sum of the responses and percentages may not equal the total. Percentages are calculated by dividing each response by the total number of persons who answered the question.

n.e.c. = not elsewhere classified.

uns. = unspecified.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaire.

Table 4. Location of worker: Injuries in oil and gas drilling and services, selected States, May-August 1982

Location at time of accident	Number	Percent
Total	1,022	100
Catwalk	40	4
Derrick or mast (excluding rig floor or monkeyboard)	20	2
Ground	234	23
Monkeyboard	42	4
Mud pit	16	2
Pipe rack	31	3
Platform on an offshore rig	18	2
Rig cellar	8	1
Rig floor	354	35
Rotary table	71	7
Stairs or ladder	33	3
Standing on equipment	58	6
Substructure	15	1
Walkway	17	2
Other	65	6

NOTE: Due to rounding, percentages may not add to 100. See appendix A for the scope of the survey. Because incomplete questionnaires were used, the total

number of responses may vary by question.

SOURCE: Survey questionnaire.

Table 5. Source of injury: Injuries in oil and gas drilling and services, selected States, May-August 1982

Source of injury	Number	Percent
Total	1,041	100
Fluids, chemicals, or chemical compounds	49	5
Drill mud	19	2
Oil	1	(¹)
Water	9	1
Hydrogen sulfide (H ₂ S)	3	(¹)
Fluids, chemicals, or chemical compounds, n.e.c. or uns.	17	2
Handtools	72	7
Powered handtools	3	(¹)
Nonpowered handtools	69	7
Downhole tools or equipment	24	2
Fish or fishing tools	1	(¹)
Packers	2	(¹)
Perforating guns	3	(¹)
Centralizers or stabilizers	1	(¹)
Testing tools or equipment	5	(¹)
Downhole tools or equipment, n.e.c. or uns.	12	1
Rotary system equipment	22	2
Rotary table	7	1
Rotary/master bushing	1	(¹)
Kelly bushing	2	(¹)
Kelly	2	(¹)
Swivel	3	(¹)
Kelly hose	7	1
Pipes, tubing, or related objects	182	17
Drill collar	19	2
Drill pipe	54	5
Bit	6	1
Subs	6	1
Casing	18	2
Rods	13	1
Tubing	27	3
Other pipes or related objects, n.e.c. or uns.	39	4
Hoisting apparatus	88	8
Crown or traveling blocks	5	(¹)
Elevator	36	3
Bail	3	(¹)
Drawworks, cathead, or their parts	7	1
Air hoist	5	(¹)
Cranes	2	(¹)
Hoisting lines or cables	27	3
Hoisting apparatus, n.e.c. or uns.	3	(¹)
Breakout or makeup equipment	150	14
Tongs	108	10
Rod wrenches	9	1
Spinning chains	9	1
Slips	18	2
Snub lines	3	(¹)
Breakout or makeup equipment, n.e.c. or uns.	3	(¹)
Other equipment, machines, or their parts	60	6
Mud pump	8	1
Engines, motors, or other pumps	10	1
Well pumping unit	8	1
Blowout preventer	11	1
Wellhead (including casing head, tubing head, or Christmas tree)	7	1
Miscellaneous or unclassifiable parts	12	1
Other equipment or machines, n.e.c.	4	(¹)
Structures, structural pieces, or working surfaces	194	19
Derrick (excluding rig floor or monkeyboard)	8	1
Rig floor	27	3
Monkeyboard	1	(¹)
Substructure	4	(¹)

See footnotes at end of table.

Table 5. Source of injury: Injuries in oil and gas drilling and services, selected States, May-August 1982—Continued

Source of injury	Number	Percent
Structures, structural pieces, or working surfaces—Continued		
Handrails or guardrails	3	(¹)
Stairs, steps, or ladders	9	1
Catwalk	5	(¹)
Pipe rack	4	(¹)
Ground or ground level surface	64	6
Beams, plates, or structural metal	23	2
Mud pits	5	(¹)
Structures, structural pieces, or working surfaces, n.e.c. or uns. ..	41	4
Miscellaneous	124	12
Barrels, kegs, boxes, sacks, etc.	23	2
Flame, fire, or smoke	7	1
Atmospheric heat or cold	10	1
Particles	39	4
Ropes, cables, chains, hoses, n.e.c.	22	2
Bodily motion	23	2
Multiple objects or substances	40	4
Objects or substances, n.e.c. or uns.	36	3
Safety lines on tongs ²		
Total	101	100
Tongs not equipped with safety lines	11	11
Tongs equipped with safety lines	90	89
Safety lines did not break	78	77
Safety lines broke	8	8
Not specified	4	4
Use of rotary table to break connection		
Total	91	100
Did not use rotary table to break connection	83	91
Used rotary table to break connection	5	5
Don't know	3	3

¹ Less than 0.5 percent.

² Includes 4 cases involving rod wrenches.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for

the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaire.

Table 6. Events leading to the accident:¹ Injuries in oil and gas drilling and services, selected States, May-August 1982

Events leading to the accident ¹	Number	Percent
Initial event		
Total	629	100
Equipment or work materials:		
Fell	33	5
Broke	60	10
Shifted position or slipped unexpectedly	271	43
Malfunctioned, jammed, or did not work properly	41	7
Accidentally activated	28	4
Tangled or caught in lines, wires, etc.	30	5
Exploded or was expelled from pressurized equipment	32	5
Other	20	3
Worker:		
Was struck by object	13	2
Fell from elevation	2	(²)
Was pinched, squeezed, or caught in object(s)	2	(²)
Struck against or was pushed against object	1	(²)
Slipped or tripped on object, substance, or surface	96	15

See footnotes at end of table.

Table 6. Events leading to the accident:¹ Injuries in oil and gas drilling and services, selected States, May-August 1982—Continued

Events leading to the accident ¹	Number	Percent
Second event		
Total	161	100
Equipment or work materials:		
Fell	42	26
Broke	7	4
Shifted position or slipped unexpectedly	69	43
Accidentally activated	6	4
Tangled or caught in lines, wires, etc.	1	1
Exploded or was expelled from pressurized equipment	1	1
Other	2	1
Worker:		
Was struck by object	21	13
Fell from elevation	4	2
Jumped from elevation	1	1
Was pinched, squeezed, or caught in object(s)	1	1
Struck against or was pushed against object	1	1
Slipped or tripped on object, substance, or surface	5	3
Third event		
Total	39	100
Equipment or work materials:		
Fell	10	26
Broke	1	3
Shifted position or slipped unexpectedly	8	21
Other	2	5
Worker:		
Was struck by object	16	41
Fell from elevation	1	3
Struck against or was pushed against object	1	3

¹ Based on workers' reports of unusual or unexpected events occurring prior to the accident.

² Less than 0.5 percent.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for

the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaire.

Table 7. Type of accident:¹ Injuries in oil and gas drilling and services, selected States, May-August 1982

Type of accident ¹	Number	Percent
Total	1,041	100
Bodily reaction	23	2
Contact with drill fluids or chemical(s) other than hydrogen sulfide ..	34	3
Contact with hydrogen sulfide	3	(²)
Fall from elevation	102	10
Fall on same level	49	5
Jump from elevation	11	1
Object in eye(s)	32	3
Overexertion while lifting, handling, or using objects	127	12
Pinched, squeezed, or caught in object(s)	114	11
Struck against or pushed against object	67	6
Struck by object	436	42
Multiple accident types	5	(²)
Other	38	4

¹ The type of accident identifies the event which produced the injury.

² Less than 0.5 percent.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for

the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaire.

Table 8. Selected types of accidents in detail:¹ Injuries in oil and gas drilling and services, selected States, May-August 1982

Selected types of accidents ¹	Number	Percent
Fall from elevation		
Total	102	100
Fall from:		
Rotary system equipment	1	1
Pipes, tubing, or related objects	2	2
Hoisting apparatus	4	4
Breakout or makeup equipment	2	2
Other equipment, machines, or their parts	12	12
Structures, structural pieces, or working surfaces	74	73
Derrick (excluding rig floor or monkeyboard)	1	1
Rig floor	25	25
Monkeyboard	3	3
Substructure	3	3
Stairs, steps, or ladders	21	21
Catwalk	7	7
Pipe rack	2	2
Mud pits	4	4
Structures, structural pieces, or working surfaces, n.e.c. or uns.	8	8
Miscellaneous objects	2	2
Objects or substances, n.e.c. or uns.	5	5
Fall on same level		
Total	49	100
Fall on:		
Rotary system equipment	3	6
Pipes, tubing, or related objects	2	4
Structures, structural pieces, or working surfaces	43	88
Rig floor	15	31
Stairs, steps, or ladders	4	8
Catwalk	3	6
Ground or ground level surface	8	16
Other	13	27
Objects or substances, n.e.c. or uns.	1	2
Overexertion while lifting, handling, or using objects		
Total	127	100
While lifting, handling, or using:		
Handtools	9	7
Downhole tools or equipment	7	6
Rotary system equipment	3	2
Pipes, tubing, or related objects	52	41
Drill collar	6	5
Drill pipe	14	11
Tubing	8	6
Other	24	19
Hoisting apparatus	6	5
Breakout or makeup equipment	16	13
Tongs	5	4
Slips	10	8
Breakout or makeup equipment, n.e.c. or uns.	1	1
Other equipment, machines, or their parts	7	6
Structures, structural pieces	6	5
Miscellaneous objects	19	15
Barrels, kegs, boxes, sacks, etc.	17	13
Ropes, cables, chains, hoses, n.e.c.	2	2
Objects or substances, n.e.c. or uns.	2	2

See footnotes at end of table.

Table 8. Selected types of accidents in detail:¹ Injuries in oil and gas drilling and services, selected States, May-August 1982—Continued

Selected types of accidents ¹	Number	Percent
Pinched, squeezed, or caught in object(s)		
Total	114	100
Pinched, squeezed, or caught in:		
Downhole tools or equipment	3	3
Rotary system equipment	3	3
Pipes, tubing, or related objects	6	5
Hoisting apparatus	15	13
Elevator	6	5
Air hoist	3	3
Hoisting lines or cables	3	3
Other	3	3
Breakout or makeup equipment	37	32
Tongs	32	28
Other	5	4
Other equipment, machines, or their parts	12	11
Structures, structural pieces, or working surfaces	5	4
Miscellaneous objects	2	2
Multiple objects or substances	31	27
Struck by object		
Total	436	100
Struck by:		
Fluids, chemicals, or chemical compounds	1	(²)
Handtools	60	14
Powered handtools	1	(²)
Nonpowered handtools	59	14
Downhole tools or equipment	13	3
Rotary system equipment	11	3
Pipes, tubing, or related objects	112	26
Drill collar	11	3
Drill pipe	32	7
Casing	16	4
Rods	9	2
Tubing	17	4
Other	27	6
Hoisting apparatus	62	14
Elevator	25	6
Hoisting lines or cables	23	5
Other	14	3
Breakout or makeup equipment	87	20
Tongs	63	14
Rod wrenches	8	2
Spinning chains	7	2
Other	9	2
Other equipment, machines, or their parts	23	5
Structures, structural pieces, or working surfaces	26	6
Miscellaneous objects or substances	29	7
Multiple objects	4	1
Objects or substances, n.e.c. or uns.	8	2
Struck against or pushed against object		
Total	67	100
Struck or pushed against:		
Handtools	2	3
Rotary system equipment	2	3
Pipes, tubing, or related objects	9	13
Hoisting apparatus	5	7
Breakout or makeup equipment	10	15
Tongs	8	12
Slips	2	3
Other equipment, machines, or their parts	10	15
Structures, structural pieces, or working surfaces	20	30
Miscellaneous objects	2	3
Objects or substances, n.e.c. or uns.	7	10

¹ The type of accident identifies the event which produced the injury.

² Less than 0.5 percent.

n.e.c. = not elsewhere classified.

uns. = unspecified.

NOTE: Due to rounding, percentages

may not add to 100. See appendix A for the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaire.

Table 9. Type of accident¹ by events² leading to the accident: Injuries in oil and gas drilling and services, selected States, May-August 1982

Type of accident ¹	Events leading to the accident ²											
	Total ³	Equipment or work materials:							Worker:		Other ⁴	None reported
		Fell	Broke	Shifted or slipped unexpectedly	Malfunctioned or jammed	Accidentally activated	Tangled or caught in lines, wires, etc.	Exploded or expelled from pressurized equipment	Struck by object	Slipped or tripped		
Total ³	1,041	85	68	348	41	34	31	33	50	101	38	412
Bodily reaction	23	1	-	3	-	-	-	-	-	10	-	10
Contact with drill fluids or chemical(s) other than hydrogen sulfide	34	-	2	1	-	-	-	4	-	-	2	25
Contact with hydrogen sulfide	3	-	-	-	-	-	-	-	-	-	-	3
Fall from elevation	102	4	11	20	3	2	-	-	12	28	5	37
Fall on same level	49	1	1	5	1	-	-	1	-	31	-	14
Jump from elevation	11	3	1	2	1	-	-	2	-	-	-	7
Object in eye(s)	32	-	2	-	-	-	-	3	1	-	1	27
Overexertion while lifting, handling, or using objects	127	-	-	16	1	-	1	-	-	4	-	107
Pinched, squeezed, or caught in object(s)	114	1	1	39	10	8	5	-	11	-	8	50
Struck against or pushed against object	67	3	5	18	2	-	2	4	25	15	6	17
Struck by object	436	71	45	243	22	24	23	11	1	13	9	89
Multiple accident types	5	1	-	-	-	-	-	1	-	-	-	3
Other	38	-	-	1	1	-	-	7	-	-	7	23

¹ The type of accident identifies the event which produced the injury.
² Based on workers' reports of unusual or unexpected events occurring prior to the accident.
³ Because more than one event is possible, the data may not be additive across the rows.
⁴ Includes 24 events involving equipment and 14 events involving the

worker.
 NOTE: See appendix A for the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question. Dashes indicate that no data were reported.
 SOURCE: Survey questionnaire.

Table 10. Falls from elevations: Injuries in oil and gas drilling and services, selected States, May-August 1982

Distance worker fell	Number	Percent
Total	102	100
Less than 3 feet	11	11
3 to 5 feet	38	37
5 to 10 feet	25	25
10 to 15 feet	15	15
15 to 20 feet	9	9
20 feet or more	4	4

NOTE: Due to rounding, percentages may not add to 100. See appendix A for the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.
 SOURCE: Survey questionnaire.

Table 11. Estimated days away from work: Injuries in oil and gas drilling and services, selected States, May-August 1982

Days away from work	Number	Percent
Total ¹	1,011	100
No days away from work	306	30
1 to 5 days	157	16
6 to 10 days	97	10
11 to 15 days	52	5
16 to 20 days	34	3
21 to 25 days	33	3
26 to 30 days	40	4
31 to 40 days	39	4
41 to 60 days	73	7
More than 60 days	54	5
Lost time cases for which days away from work were not estimated	126	12
Mean days away from work per lost workday case	26	
Median days away from work per lost workday case	14	

¹ Excludes 12 workers for whom data were not available because they retired, were laid off, or put on permanent disability.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for

the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaire.

Table 12. Length of hospitalization required: Injuries in oil and gas drilling and services, selected States, May-August 1982

Length of hospitalization	Number	Percent
Total	1,022	100
No hospitalization required	795	78
1 night	26	3
2 nights	23	2
3 nights	30	3
4 nights	28	3
5 nights	21	2
6 nights	12	1
7 nights	16	2
8 nights	5	(¹)
9 nights	12	1
10 nights	9	1
11 to 20 nights	13	1
21 to 30 nights	10	1
More than 30 nights	4	(¹)
Hospitalized cases for which length of hospitalization was not estimated	18	2
Mean length of hospitalization per hospitalized case	7	
Median length of hospitalization per hospitalized case	4	

¹ Less than 0.5 percent.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for the scope of the survey. Because incom-

plete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaire.

Table 13. Nature of injury: injuries in oil and gas drilling and services, selected States, May-August 1982

Nature of injury	Number	Percent
Total ¹	1,041	(¹)
Fracture	282	27
Cut, laceration, or puncture	299	29
Bruise or contusion	287	28
Muscle sprain, strain, or torn ligaments	343	33
Chemical burn	36	3
Concussion	21	2
Heat burn	21	2
Amputation	40	4
Foreign body in eye(s)	32	3
Other	85	8

¹ Because more than one response is possible, the sum of the responses and percentages may not equal the total. Percentages are calculated by dividing each response by the total number of persons who answered the question.

NOTE: Due to rounding, percentages

may not add to 100. See appendix A for the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaire.

Table 14. Part of body affected: injuries in oil and gas drilling and services, selected States, May-August 1982

Part of body	Number	Percent
Total	1,041	100
Head	138	13
Brain	3	(¹)
Ear(s)	6	1
Ear(s), external	2	(¹)
Ear(s), internal	4	(¹)
Eye(s)	56	5
Face	51	5
Jaw	8	1
Mouth	19	2
Nose	5	(¹)
Face, multiple parts	7	1
Face, n.e.c. or uns.	12	1
Scalp	9	1
Head, multiple	12	1
Head, n.e.c. or uns.	1	(¹)
Neck	9	1
Upper extremities	341	33
Arm(s)	54	5
Upper arm	3	(¹)
Elbow	9	1
Forearm	15	1
Arm, multiple	6	1
Arm, n.e.c. or uns.	21	2
Wrist	11	1
Hand	56	5
Finger(s)	211	20
Upper extremities, multiple	9	1
Trunk	239	23
Abdomen	28	3
Back	135	13
Chest	31	3
Hips	18	2
Shoulder(s)	13	1
Trunk, multiple	12	1
Trunk, uns.	2	(¹)

See footnotes at end of table.

Table 14. Part of body affected: Injuries in oil and gas drilling and services, selected States, May-August 1982—Continued

Part of body	Number	Percent
Lower extremities	215	21
Leg(s)	84	8
Thigh	5	(¹)
Knee	43	4
Lower leg	20	2
Leg, multiple	7	1
Leg, n.e.c. or uns.	9	1
Ankle	50	5
Foot	52	5
Toe(s)	19	2
Lower extremities, multiple	9	1
Lower extremities, n.e.c. or uns.	1	(¹)
Multiple parts	87	8
Body system	12	1

¹ Less than 0.5 percent.
n.e.c. = not elsewhere classified.
uns. = unspecified.
NOTE: Due to rounding, percentages

may not add to 100. See appendix A for the scope of the survey.
SOURCE: State workers' compensation reports.

Table 15. Age and sex of worker: Injuries in oil and gas drilling and services, selected States, May-August 1982

Age and sex	Number	Percent
Age		
Total	1,041	100
16—19	68	7
20—24	313	30
25—34	393	38
35—44	109	10
45—54	53	5
55 or more	19	2
Not available	86	8
Sex		
Total	1,041	100
Men	1,040	100
Women	1	(¹)

¹ Less than 0.5 percent.
NOTE: Due to rounding, percentages may not add to 100. See appendix A for

the scope of the survey.
SOURCE: State workers' compensation reports.

Table 16. Training: Injuries in oil and gas drilling and services, selected States, May-August 1982

Worker training	Number	Percent
Source of training for present job		
Total ¹	970	(¹)
Current supervisor or employer	330	34
Previous supervisor or employer	494	51
Safety representative	14	1
Co-worker (other than supervisor)	274	28
Other	11	1
Training in safety procedures for job worker was doing when injured		
Total	954	100
No, training did not cover safety procedures	200	21
Yes, training did cover safety procedures	676	71
Don't remember	78	8
Other safety training received		
Total ¹	920	(¹)
When and how to use respirator	255	28
When and how to use safety belt, lanyard, and lifeline	485	53
Firefighting and blowout prevention procedures	439	48
First aid	412	45
Proper lifting, carrying, or handling methods	506	55
When and where to use personal protective equipment	687	75
Other	45	5
Did not receive other safety training	123	13
How safety training was given		
Total ¹	915	(¹)
Printed materials (safety manual, textbook, etc.)	285	31
In school or other type of classroom instruction	216	24
On the job	733	80
Safety meetings	454	50
Other	6	1
Never received safety training	73	8

¹ Because more than one response is possible, the sum of the responses and percentages may not equal the total. Percentages are calculated by dividing each response by the total number of persons who answered the question.

NOTE: Due to rounding, percentages

may not add to 100. See appendix A for the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaire.

Table 17. Protective equipment: Injuries in oil and gas drilling and services, selected States, May-August 1982

Protective equipment worn or used at time of accident	Number	Percent
Total ¹	1,014	(¹)
Ear plugs or other hearing protection	14	1
Gloves	864	85
Hard hat	905	89
Respirator	-	-
Safety glasses, goggles, or other eye protection	108	11
Steel-toed safety shoes or boots	908	90
Welder's hood	6	1
Tied off with safety belt, lanyard, and lifeline	48	5
Wearing safety belt but not tied off to lanyard and lifeline, etc.	4	(²)
Guardrails or safety railing at exposed heights	72	7
Other	10	1
Not wearing or using protective equipment	17	2

¹ Because more than one response is possible, the sum of the responses and percentages may not equal the total. Percentages are calculated by dividing each response by the total number of persons who answered the question.

² Less than 0.5 percent.

NOTE: Due to rounding, percentages

may not add to 100. See appendix A for the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question. Dashes indicate that no data were reported.

SOURCE: Survey questionnaire.

Table 18. Conditions or factors contributing to accident: Injuries in oil and gas drilling and services, selected States, May-August 1982

Conditions or factors worker felt contributed to accident	Number	Percent
Condition of equipment or work materials		
Total ¹	865	(¹)
Too heavy or bulky	97	11
Not properly secured or tied down	63	7
Not equipped with a safeguard	28	3
In bad condition	26	3
Other	15	2
Condition of equipment or work materials did not contribute to accident	646	75
Conditions at the worksite		
Total ¹	897	(¹)
Weather at time of accident (rain, wind, etc.)	64	7
Slippery surface	156	17
No guardrails or safety railings	16	2
Working in a limited area or space	109	12
Poor lighting	25	3
Cluttered work area	32	4
Unstable rig	3	(²)
No warning of sour gas (H ₂ S)	1	(²)
Other	27	3
No conditions at the worksite led to injury	559	62

See footnotes at end of table.

Table 18. Conditions or factors contributing to accident: Injuries in oil and gas drilling and services, selected States, May-August 1982—Continued

Conditions or factors workers felt contributed to accident	Number	Percent
Other contributing factors		
Total ¹	931	(¹)
Not paying full attention to work	91	10
Not following instructions	4	(²)
Not given right instructions on how to do job	19	2
Recent change in work routine or procedures	60	6
Tired or fatigued	76	8
In a hurry	262	28
Upset or under stress	22	2
Misjudged time or distance needed to avoid injury	99	11
Not aware of hazardous conditions	142	15
Co-worker activity	200	21
Other	48	5
No other factors contributed to accident	255	27

¹ Because more than one response is possible, the sum of the responses and percentages may not equal the total. Percentages are calculated by dividing each response by the total number of persons who answered the question.

² Less than 0.5 percent.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaire.

Appendix A.

Survey Explanatory Note

The survey was designed to develop information on injuries in oil and gas drilling and selected well services. Service operations were limited to well completion, servicing, and workover which involve the preparation of wells for production and maintenance or remedial work on producing wells to improve or maintain production, such as casing, cementing, perforating, stimulating, or swabbing of the well, and pulling rods or tubing. Motor vehicle accidents or assaults were excluded. Drilling and well service operations are classified in the Standard Industrial Classification Manual as SIC 1381—Drilling Oil and Gas Wells, and SIC 1389—Oil and Gas Field Services, Not Elsewhere Classified. Because of the focus of the survey, the following field services were excluded: Building of oil and gas well foundations on site; compressing of gas at the field; erecting, cleaning, and repairing of oilfield lease tanks; excavating slush pits and cellars; grading oil and gas well foundations; impounding and storing water in connection with petroleum production; oil sampling service for oil companies; pumping of oil and gas wells; and removal of condensed gasoline from field (gathering) lines.

Occupations selected for study paralleled the activities within the scope of the survey: Derrickmen; divers; drillers; engineers; mechanics; crane or mobile equipment operators; motormen or electricians; roughnecks, floorhands, or rotary helpers; roustabouts and general or specialized laborers; supervisors; technicians; tool pushers; welders; and well-servicing equipment operators. Excluded were workers such as painters or cooks who were not directly involved in drilling or servicing activities. Finally, cases were excluded from the survey if the injury resulted in a fatality or if more than 120 days had elapsed between the time of the injury and the beginning of the survey.

The survey covered injured workers in 12 States, which are listed in appendix B, and on offshore rigs in the Gulf of Mexico. To identify cases within the scope of the survey, staff of participating State agencies reviewed employers' reports of injuries required by State workers' compensation laws and mailed questionnaires to injured workers selected for the study. They requested cooperation on a voluntary basis. Through an agreement with the U.S. Department of Labor, Office of Workers' Compensation Programs (OWCP), workers injured on offshore rigs were identified through workers' compensation claims filed in the OWCP's New

Orleans area office and were surveyed directly by the BLS Dallas Regional Office. During the survey period, May-August 1982, 1,041 survey questionnaires were returned and found to be within the scope of the survey, resulting in a 45-percent response rate. Because worksite locations may require workers to live away from home, where the mail questionnaires were sent, coupled with a high degree of job mobility, contacting workers by mail was difficult, particularly where a response was requested in a limited time period.

Although data were aggregated for 12 States and offshore sites, it should be noted that the workers' compensation cases selected for study reflect differences in reporting requirements. For example, some participating States require reporting of workers' compensation cases involving medical treatment regardless of lost time, while others limit reporting to cases involving lost time ranging from 1 to 8 days.

No attempt was made to weight the data collected so that they would be representative of oil and gas drilling and well service injuries. Although the 12 participating States accounted for more than two-thirds of the rotary rigs drilling at the time of the survey, they were not selected statistically to represent the country as a whole.¹ Moreover, data collection was terminated when responses exceeded 750 cases.

Questionnaires returned by the injured workers were reviewed for completeness and response errors. Responses provided to questions E, F, J, and parts of K (see appendix C for questionnaire) were coded by BLS to reflect the type of accident (the event which produced the injury) and any unusual or unexpected events leading to the injury.² The codes for type of accident were modeled after the American National Standards Institute method of recording accident facts (ANSI Z16.2) and were modified to account for unique industry characteristics. The codes describing events leading to the injury were developed by BLS specifically for this survey. Codes were also developed to classify the equip-

¹ Based on rotary rigs drilling for oil and gas wells surveyed by the Hughes Tool Company for the week beginning September 27, 1982.

² The following texts were referenced in classifying injuring events, occupations, equipment, and in defining industry terms: Ron Baker, *A Primer of Oilwell Drilling, A Primer of Oilwell Service and Workover*, and *A Dictionary of Petroleum Terms* (Austin, Texas, Petroleum Extension Service, the University of Texas at Austin, 1979); and *Safety Information Profile, Oil and Gas Field Operations* (JRB Associates, Inc., for the National Institute for Occupational Safety and Health, 1981).

ment, objects, surfaces, and substances which produced the injury (source of injury) or which were associated with the type of accident or the events leading to the accident. With the exception of jumps or falls from elevations, the equipment, object, or substance listed as the source of injury (table 5) are identical to the equipment, object, or substance reflected in the detailed type of accident (table 8). In falls from elevations and jumps, the source of injury is the surface fallen to, while the detailed type of accident indicates the surface fallen from.

Where feasible, responses on the questionnaires falling into the "other" category of the multiple choice questions were classified by BLS to provide as much descriptive information as possible. Therefore, the responses tabulated for questions B (worker activity), D (location), I (equipment being used by the worker), N (occupation), and U (nature of injury) differ slightly

from those shown on the questionnaire.

Estimates of the mean and median lost workdays and nights of hospitalization do not include cases in which workers indicated lost time or hospitalization but failed to provide numerical estimates of the amount of time.

All usable responses of incomplete questionnaires were used in the tabulations. Consequently, response rates among questions vary. No attempt was made to adjust the data for nonresponse.

Information on the employer's industry classification and the worker's age, sex, and part of body injured were classified and tabulated for all respondents based on information furnished by the employer in the workers' compensation report.

Numerical values shown in the tables were actual counts while percentages were rounded to the nearest whole number.

Appendix B. Participating State Agencies

**Alaska Department of Labor
California Department of Industrial Relations
Colorado Department of Labor and Employment
Kentucky Department of Labor
Montana Department of Labor and Industry
New Mexico Health and Environment Department
Oklahoma Workers' Compensation Court**

**Ohio Industrial Commission
Tennessee Department of Labor
Texas Industrial Accident Board and Department of
Health
Utah Industrial Commission
Wyoming Department of Labor and Statistics**

Appendix C. Survey Questionnaire

Bureau of Labor Statistics
Work Injury Report
Injuries in Oil and Gas Extraction

U.S. Department of Labor



The information collected on this form by the Bureau of Labor Statistics and the State Agencies cooperating in its statistical program will be held in confidence and will be used for statistical purposes only.

This report is authorized by law 29 U.S.C. 2. Your voluntary cooperation is needed to make the results of this survey comprehensive, accurate, and timely.

Form Approved
O.M.B. No. 1220-0047
Approval Expires 9/30/82

State Case Number Date of Accident - -

A. What type of well operation was being carried out at the time of your accident? (Check one.)

1. Drilling (making hole, well completion, etc.)
2. Well service or workover (pulling rods or tubing, wireline, etc.)

B. What kind of work were you doing when injured? (Check one.)

1. Adding a joint
2. Casing
3. Cementing
4. Loading or unloading material
5. Mixing or working with mud or other drilling fluids
6. Pulling rods or tubing
7. Repairing or servicing pumps, engines, generators or other motors
8. Setting up rig
9. Well stimulation (using explosives, acid, etc.)
10. Swabbing
11. Tripping out or in
12. Other: (Describe) _____

C. How often do you normally do this type of work? (Check one.)

1. First time you did this type of work
2. Daily or almost every day
3. Several times a month
4. About once a month
5. Seldom—less than once a month

D. Where were you at the time of your accident? (Check one.)

1. Catwalk
2. Ground
3. Monkeyboard
4. Rig floor
5. Rotary table
6. Stairs or fixed (nonportable) ladder
7. Walkway
8. Pipe rack
9. Standing on equipment (such as well head, elevator, etc.)
10. Other: (Describe) _____

E. How did your accident occur? (Check all the events that occurred.)

1. Hit by equipment or object(s): (Describe) _____
2. Fell
3. Slipped or tripped
4. Pinched or squeezed between parts of machinery or objects:
(Describe) _____
5. Strained muscle while lifting, carrying or handling object(s)
6. Pushed or slammed into equipment or object(s)
7. Injured by chemical, drill mud or other drilling fluids
8. Object went into eye(s)
9. Poisoned or affected by sour gas (H₂S)
10. Other: (Describe) _____

F. If you checked more than one response in question E, indicate which event occurred first. (Check one.)

1. Hit by equipment or object(s)
2. Fell
3. Slipped or tripped
4. Pushed or slammed into equipment or object(s)
5. Other: (Describe) _____

G. If you fell, how far did you fall? (Check one.)

1. Less than 3 feet or to same level
2. 3 to 5 feet
3. 5 to 10 feet
4. 10 to 15 feet
5. 15 to 20 feet
6. 20 feet or more

H.a. If you were injured by tongs, was the rotary table used to break a connection?

1. No
2. Yes
3. Don't know

b. Were the tongs equipped with safety lines?

1. No
2. Yes — Did the safety lines break?
 1. Yes
 2. No
3. Don't know

I. What were you working with or handling at the time of your accident? (Check all that apply.)

1. Chemical, drill mud or other drilling fluid
2. Pipes, collars, tubes, casing or rods
3. Hand tool (portable saw, hammer, etc.)
4. Kelly, kelly bushing or kelly bushing guard
5. Tongs
6. Welding or grinding equipment
7. Pumps, engines, generators, other motors or their parts
8. Blowout preventor
9. Elevator, block, swivel, hook or slips: (Describe) _____
10. Drawworks, cathead, other hoisting apparatus or their parts (such as clutches, chains, lines, etc.): (Describe) _____
11. Packer, fish or other downhole equipment or tool
12. Other: (Describe) _____
13. Not working with or handling any objects at the time

J. Identify any equipment or work materials which contributed to your accident and explain how they were involved.

For example: 1.) Chain to tongs got stuck, reached to fix it, driller pulled wrong lever, cathead engaged, tongs struck me. 2.) Strained muscle when I pulled on wrench. 3.) Flap on racking board broke loose and fell on me.

K. To your knowledge, why did the equipment or work materials contribute to your accident? (Check all that apply.)

- Equipment or work materials:
1. Broke
 2. Shifted position or slipped unexpectedly
 3. Were too heavy or bulky
 4. Malfunctioned, jammed or did not work properly
 5. Accidentally activated
 6. Not properly secured or tied down
 7. Not equipped with a safeguard
 8. Other: (Describe) _____
 9. Equipment or work materials did not contribute

L. Were there any conditions at the worksite which you feel contributed to your accident? (Check all that apply.)

1. Weather at time of accident (rain, wind, etc.)
2. Slippery surface
3. No guardrails or safety railings
4. Working in a limited area or space (standing on a monkeyboard, etc.)
5. Poor lighting
6. Cluttered work area (trash lying on floor, etc.)
7. Unstable rig (such as rig swaying due to rough seas, wind, improper or broken guys, etc.)
8. No warning of sour gas (H₂S)
9. Other: (Describe) _____
10. No conditions at the worksite led to injury

M. Check any other factors which you feel contributed to your accident. (Check all that apply.)

1. Not paying full attention to work
2. Not following instructions
3. Not given right instructions on how to do job
4. Recent change in work routine or procedures
5. Tired or fatigued
6. In a hurry
7. Upset or under stress
8. Misjudged time or distance needed to avoid injury
9. Not aware of hazardous condition(s)
10. Co-worker's activity: (Describe) _____
11. Other: (Describe) _____
12. No other factors contributed to accident

CONTINUE ON REVERSE SIDE

N. What was your job title at the time of your accident? (Check one.)

1. Derrickman
2. Driller
3. Mobile equipment operator (such as crane operator, etc.): (Describe) _____
4. Motorman or electrician
5. Roughneck, floorhand or rotary helper
6. Roustabout or laborer
7. Other: (Describe) _____

O. How long were you employed in this job when you were injured? (Check one.)

1. Less than 1 month
2. 1 month to 6 months
3. 6 months to 1 year
4. 1 year to 5 years
5. 5 years or more

P. Who trained you for this job? (Check all that apply.)

1. Current supervisor or employer
2. Previous supervisor or employer
3. Safety representative
4. Co-worker (other than supervisor)
5. Other: (Describe) _____

Q. Did your training cover safety procedures for the job you were doing when injured?

1. No
2. Yes
3. Don't remember

R. What other safety training did you receive? (Check all that apply.)

1. When and how to use respirator
2. When and how to use safety belt, lanyard and lifeline
3. Firefighting and blowout prevention procedures
4. First aid
5. Proper lifting, carrying or handling methods
6. When and where to use personal protective equipment such as gloves, hard hat, etc.
7. Other: (Describe) _____
8. Did not receive other safety training

S. How was your safety training given? (Check all that apply.)

1. Printed materials (safety manual, textbook, etc.)
2. In school or other type of classroom instruction
3. On the job
4. Safety meetings
5. Other: (Describe) _____
6. Never received safety training

T. What type of protective equipment were you wearing or using at the time of your accident? (Check all that apply.)

1. Hard hat
2. Safety glasses, goggles or other eye protection
3. Ear plugs or other hearing protection
4. Welder's hood
5. Gloves
6. Steel-toed safety shoes or boots
7. Respirator
8. Tied off with safety belt, lanyard and lifeline
9. Wearing safety belt, but *not tied off* to lanyard and lifeline, etc.
10. Guardrails or safety railings at exposed heights
11. Other: (Describe) _____
12. Not wearing or using protective equipment

U. What were your injuries? (Check all that apply.)

1. Fracture(s)—Indicate bone(s) broken (leg, rib, ankle, etc.) _____
2. Cuts, lacerations or punctures
3. Bruises, contusions
4. Muscle sprain or strain, torn ligaments
5. Burns
6. Brain concussion
7. Other: (Describe) _____

V. How many workdays did you (or do you expect to) lose due to your injury? (NOTE: Do not count the day of injury, days on light duty work, normal days off or holidays.)

_____ Workdays

Check here _____ if you did not lose time beyond the day of injury.

W. Did your injury require you to be hospitalized overnight?

1. No
2. Yes
If yes, how long were you (or do you expect to be) in the hospital?

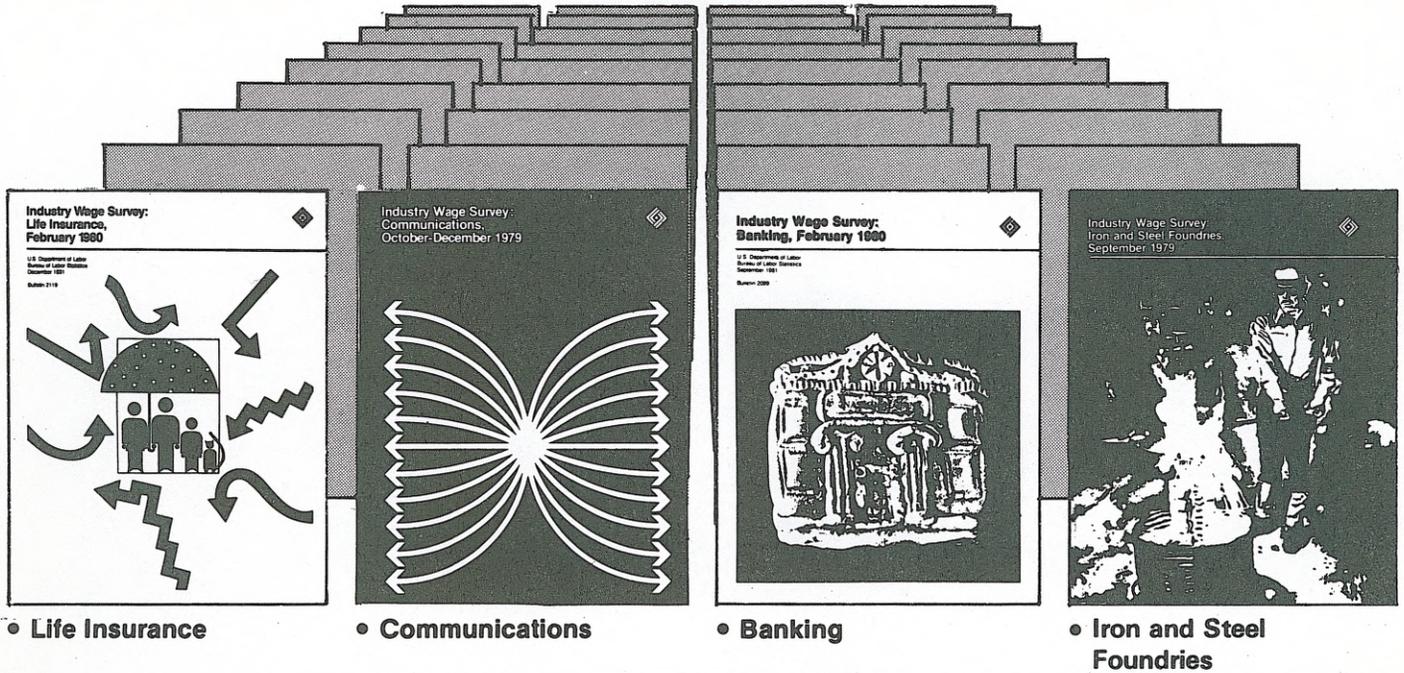
_____ Nights

In your own words, tell how the accident happened.

How could it have been prevented?

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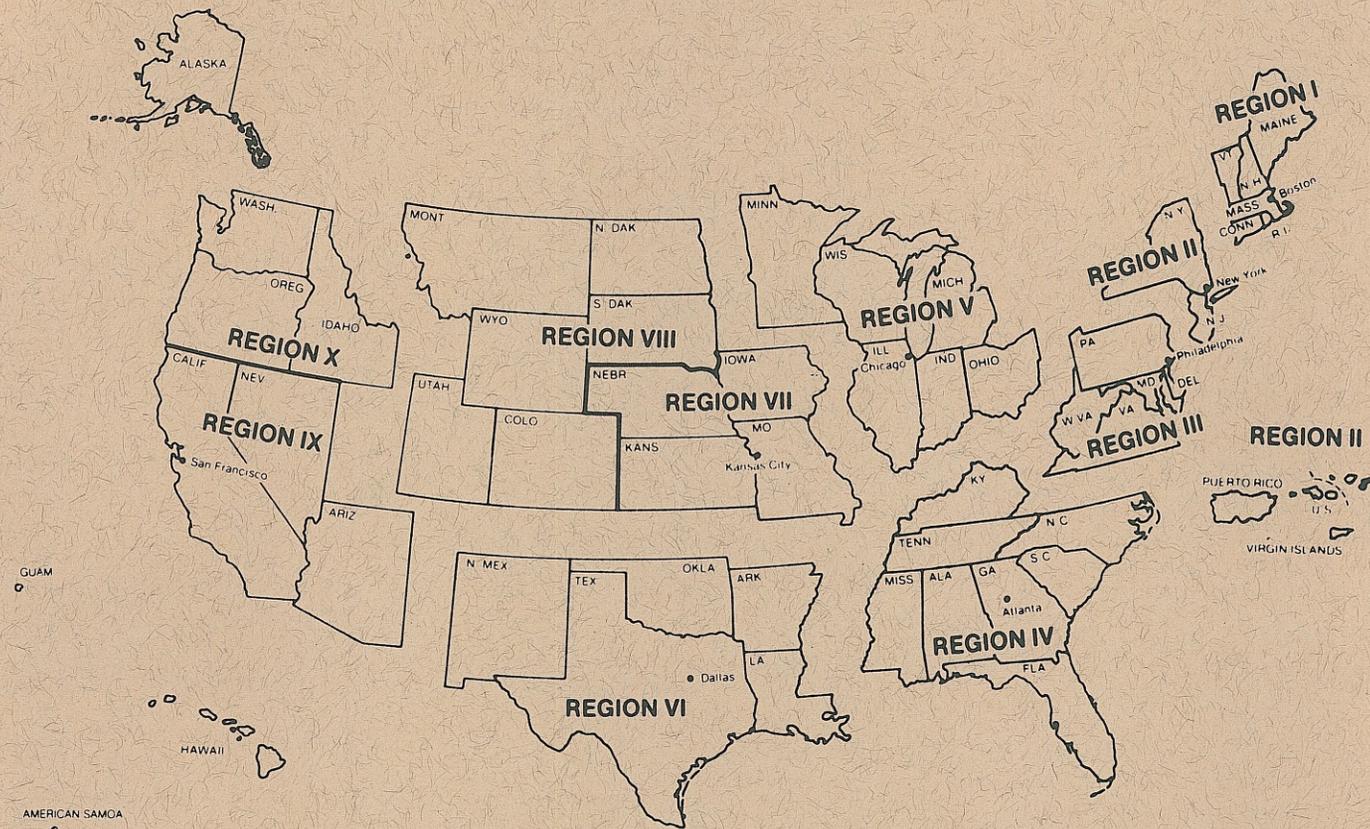
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