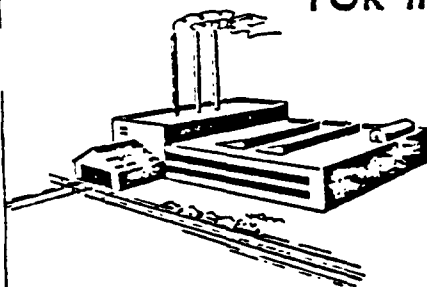
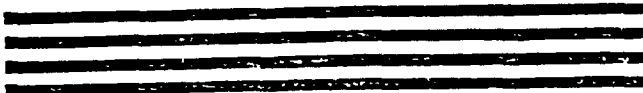


ACCIDENT PREVENTION MANUAL

FOR INDUSTRIAL OPERATIONS



4  **th** EDITION

NATIONAL SAFETY COUNCIL
Chicago 11, Illinois

PLAINTIFF'S
EXHIBIT

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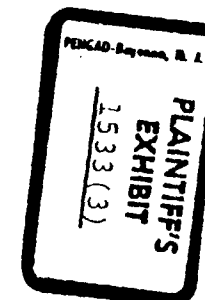
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TABLE 11-C. STATUTORY PROVISIONS RELATING TO MEDICAL BENEFITS

Full Benefits			Limited Benefits		
State	Law specifies full benefits	Law limits period or amount but authorizes administrative agency to extend without limit	State	Period	Amount
Arizona ¹	No	(1)	Alabama	6 months	\$1,200
Arkansas ¹	No	Yes	Alaska	4 years	
California	Yes		Colorado	6 months	1,500
Connecticut	Yes		Georgia	10 weeks ²	1,125 ³
Delaware	Yes		Iowa		1,500 ⁴
District of Columbia	Yes		Kansas	120 days ⁵	2,500
Florida	No	Yes	Kentucky		2,500
Hawaii	Yes		Louisiana		2,500
Idaho	Yes		Montana	36 months	2,500 ⁶
Illinois ¹	Yes		South Dakota	20 weeks	300 ¹⁰
Indiana	No	Yes	Tennessee	1 year	1,500
Maine ¹	No	Yes	Vermont ¹		2,500
Maryland	No	Yes ⁷	Virginia	60 days ¹¹	
Massachusetts	Yes		West Virginia ¹		1,600 ¹²
Michigan	No	Yes			
Minnesota	Yes				
Mississippi	Yes				
Missouri	No	Yes			
Nebraska	Yes				
Nevada ¹	No	Yes			
New Hampshire	No	Yes			
New Jersey	No	Yes			
New Mexico	No	Yes			
New York	Yes				
North Carolina	No	Yes			
North Dakota	Yes				
Ohio	No	Yes ⁷			
Oklahoma	No	Yes			
Oregon	No	Yes			
Pennsylvania	No	Yes ⁴			
Puerto Rico	Yes				
Rhode Island	No	Yes			
South Carolina	No	Yes			
Texas ¹	Yes				
Utah ¹	No	Yes			
Washington ¹	Yes				
Wisconsin	Yes				
Wyoming	No	Yes			
United States:					
Federal employees	Yes				
Longshoremen	Yes				

Source: U. S. Department of Labor, Bureau of Labor Standards, August, 1957

¹ Limited benefits for occupational diseases: Arizona and Utah. Limited or no benefits for silicosis and asbestosis: Arkansas, Illinois, Maine, Nevada, Texas, Vermont, West Virginia. In West Virginia no allowance for medical treatment for silicosis.

² Full medical aid, in the judgment of the Arizona Industrial Commission, is authorized through a combination of the medical care and rehabilitation provisions of the law.

³ Maryland and Ohio laws set no initial amount or period; all medical benefits authorized by administrative agency.

⁴ Initial amount authorized for surgical and medical services and supplies limited to \$450. In addition, hospital services and orthopedic appliances and prostheses are allowed for the first 6 months. The Board may order further medical, surgical, and hospital services after end of the first 6-month period if further care will substantially restore earning power.

⁵ Under certain conditions, medical benefits terminate.

⁶ Period may be extended for additional time, and an additional amount not exceeding \$375.

⁷ \$1,000 maximum for hospital service and supplies and \$500 for medical and surgical services. Commission may authorize an additional \$1,000.

⁸ In extreme cases, Commissioner may require employer to furnish care for a longer period. In case of silicosis, such additional period is limited to 90 days.

⁹ In cases of total disability where the \$2,500 is insufficient to meet all hospitalization expenses, additional benefits may be allowed.

¹⁰ Also, hospital benefits not to exceed \$700.

¹¹ May be extended for year including the first 60 days.

¹² Additional \$800 may be authorized.

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TABLE 11-1. WAITING PERIOD IN VARIOUS JURISDICTIONS

Waiting Period	Jurisdiction	Compensation Retroactive If Disability Lasts Period Indicated
None.....	Oregon	Not applicable
2 days.....	Hawaii (temporary total only)	More than 7 days
3 days.....	Alaska	No provision
	Delaware (no waiting period in case of amputation of a member of the body, or a part thereof, or when the injury results in hospitalization of the employee)	7 days, including date of injury
	District of Columbia	More than 28 days
	Maryland	More than 28 days
	Missouri	More than 4 weeks
	Rhode Island (total disability only) ..	More than 2 weeks
	Utah	No provision
	Washington	30 days
	Wisconsin	More than 10 days
	Wyoming (temporary total disability only)	More than 8 days
	United States—Federal employees (temporary disability only)	More than 21 days
	United States—longshoremen	More than 28 days
4 days.....	Florida	No provision
	Puerto Rico (temporary disability only) ..	2 weeks
5 days.....	Mississippi	14 days
	Nevada	5 days
	North Dakota	5 days
	Oklahoma	5 days
7 days.....	Alabama (temporary disability only) ..	28 days
	Arizona	More than 2 weeks
	Arkansas	4 weeks
	California	More than 49 days
	Colorado	More than 6 weeks
	Connecticut	10 days
	Georgia	No provision
	Idaho	More than 4 weeks
	Illinois (temporary total disability only) ..	More than 28 days
	Indiana (temporary disability only) ..	More than 28 days
	Iowa (permanent total, temporary total, and temporary partial disability) ..	Compensation not retroactive, but compensation increased by one-third 4th, 5th, and 6th weeks of disability
	Kansas	No provision
	Kentucky	More than 2 weeks
	Louisiana	6 weeks
	Maine	More than 28 days
	Massachusetts	8 days
	Michigan	4 weeks (also retroactive from first if death results from injury)
	Minnesota (temporary disability only) ..	3 weeks
	Montana	3 weeks (6 weeks if injured worker no dependents residing in the United States)
	Nebraska	6 weeks
	New Hampshire	7 days
	New Jersey	More than 4 weeks
	New Mexico	More than 4 weeks
	New York	More than 35 days

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recent years, there has been increasing use of general coverage.

In the case of occupational diseases, the amounts of compensation for disability or death, medical care, or coverage are usually the same as those for accidental injuries except with respect to silicosis, asbestosis, and other dust diseases.

So that employers can obtain information relative to occupational diseases suffered by applicants for employment, some states have placed considerable responsibility upon the employee. An employee in these states is penalized for false representation, for failure to give certain information, or for misleading omissions from his previous health history.

Since occupational diseases develop or "accumulate" over a long period of time during which a worker may have several different employers, some provision must be made for fixing responsibility. In most states, the employer under whom the employee was last injuriously exposed is held liable for the compensation. Some states provide that the last employer may appeal to the commission to have the costs for compensation properly apportioned among the other employers who are liable.

In any event, it behooves an employer to require physical examination of all new employees at the time of hiring, not only to fix responsibility for occupational diseases, existing hernias, and other physical weaknesses or disabilities, but also, of even more importance, to facilitate proper placement. Periodic re-examinations should be made when specific operations include silica, lead, asbestos, and other similarly hazardous exposures.

There is much controversy concerning whether loss of hearing should be considered an occupational disease and, if it is so considered, how payments should be made. Studies show that certain noisy occupations cause deafness. However, the situation is complicated by the fact that nearly everyone suffers hearing impairment with age. An important question is whether the worker should be given a monetary award before he sustains an economic loss as distinguished from a physiologic loss.

With the growing use of sources of atomic energy for industrial purposes, the full protection of workers who are injured by radiation on the job presents new problems. One

important problem is the reconciling of time limitations for filing disability benefit claims and the fact that in most cases manifestation of disability due to radiation injury is delayed for an extended time.

The states having full coverage of all occupational diseases would cover injuries due to radiation. Some states specifically include such injuries in their schedules. Eight states do not cover any injury due to radiation.

General Liability Insurance

Several types of public liability insurance have been designed to protect a person against the various liabilities which face him in his business and personal life.

A person's liability to others may be created by statute, may result from common law precedents, or may exist by way of a contractual obligation.

Most liability insurance policies have two types of coverage: coverage for bodily injury liability and coverage for property damage liability. Each type of coverage is separately rated, and a different limit of liability may be purchased for each. The policy may also be written for bodily injury coverage only, without protection against property damage liability.

Under bodily injury coverage, the policy undertakes to pay on behalf of the insured all sums which the insured becomes legally obligated to pay by reason of the liability imposed on him by law for bodily injury, including death, sustained by any person as the result of an accident.

Under property damage coverage, the policy undertakes to pay on behalf of the insured all sums which the insured becomes legally obligated to pay by reason of the liability imposed on him by law for damages to property caused by accident.

To provide proper liability protection, it is usually necessary to combine the basic coverage of the premises with one or more of the other forms of insurance and to select suitable limits of liability for both bodily injury and property damage in each case. The comprehensive general liability policy provides automatic coverage for many new hazards that may develop after purchase of the desired coverage.

Liability insurance is commonly purchased on a scheduled form. The policy is made

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up of several divisions with each covering a specific set of hazards. The following discussion will merely indicate the primary differences in the divisional coverages.*

Owners, landlords, and tenants liability

Owners, landlords, and tenants liability insurance is designed to insure owners and lessees of buildings, vacant land, residences, mercantile premises of all kinds, both wholesale and retail, and various types of service businesses and operations like amusement parks, bazaars, shows, banks, clubs, libraries, newsstands, and similar occupancies of a nonmanufacturing nature.

The policy covers the ownership and maintenance or use of the premises for the purposes stated in the policy. The term "premises" includes all buildings and structures on a described site and the ways immediately adjoining it.

Division I of this type of liability policy also covers all operations necessary or incidental to the insured's operations. The policy would, therefore, cover not only accidents which occur on the insured's premises but also those which occur away from the premises, provided that they arise out of the insured's regular operations. Thus, if the insured's employees in delivering a product to a customer at his home injure someone, the policy will cover.

Manufacturers and contractors liability

Manufacturers and contractors liability insurance is designed to provide indemnity against claims in connection with manufacturing or contracting operations on account of injuries or losses to persons not employed by the insured.

It covers various types of service or contracting operations in which construction, installation, repair, or maintenance work is done. In manufacturing risks, machine hazards and the hazards in the operation of a railroad sidetrack must also be considered.

The public hazards on contracting operations are highly varied because of the location and nature of the work and the manner in which operations are conducted. Such operations include demolition, moving of

buildings, excavation, and construction work of all kinds.

Elevator liability

Elevator liability insurance provides indemnity against loss by reason of the liability imposed by law upon the insured for damages on account of accidents to persons not employed by the insured as the result of the existence, maintenance, and use of any elevator, hoist, escalator, or similar device described in the policy.

Certain types of lifting equipment are not considered elevators within the meaning of this coverage. Thus, hoists within a building which are not operated through a hatchway, manually operated hoists outside the building, hoists used to raise automobiles for service lubrication, dumb-waiters not over 4 feet in height, and similar equipment are not considered elevators.

Product liability

Product liability coverage indemnifies the insured against claims for bodily injury or death to any person not employed by the insured, by reason of the consumption, handling, or use of any product manufactured, sold, handled, or distributed by the insured, as listed in the policy schedule.

Product property damage coverage indemnifies the insured against claims for damage to or destruction of the property of others by reason of the consumption, handling, or use of any product manufactured, sold, handled, or distributed by the insured, as listed in the policy schedule.

It is not generally appreciated that a manufacturer may be held liable for conditions in the goods he produces which cause injury to persons or damage to property. Manufacturers have found themselves directly liable to the ultimate consumer of their product, even though it had passed through many hands after it was sold by them. Liability for injury or damage is particularly enhanced when products are "inherently dangerous" or are made for human consumption—preparations like drugs and medicines.

Some court decisions have held that the very fact that a product causes serious injury demonstrates that it possesses the power to become dangerous if defectively made. Manufacturers have been held liable for damages to remote purchasers with whom the manufacturers have never dealt, or whom

*Digest of coverages from *Property and Casualty Insurance, A Guide Book for Agents and Brokers*, by Philip Gordis, 1953 (The Rough Notes Company, Inc.).

INDUSTRIAL POISONS

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cells, which appear as a dark or bloody urine. The kidneys may then become too clogged to operate at all.

The possibility of arsine formation should always be considered when there is hydrogen formation around the active metals or around ores of the heavy metals, since arsenic is widely distributed in small amounts and only a trace of it is required to produce enough arsine to be troublesome.

One of the more common sources of arsine incidents in recent years has been the handling of dross from the aluminum refining of metals.* Probably the most significant observation about these cases, aside from the fact that the moisture in the atmosphere is enough to form arsine, is the fact that the people involved in them have not been aware of the garlic-like odor which is supposed to be a warning of the presence of arsine.

The extremely high acute toxicity is reflected in the maximum acceptable concentration of 0.05 ppm. Arsine, in very small amounts, is also capable of producing a chronic type of poisoning, but it is more typically a source of acute episodes.

Asbestos is a hydrated magnesium silicate found in the minerals chrysotile, amianthus, actinolite, and tremolite. Practically all the commercial asbestos is either chrysotile or amianthus, and about 90 per cent of that used in this country is chrysotile. It is used almost exclusively for heat insulation or for textiles which must resist high temperature, such as heat-resistant clothing and brake linings.

Inhalation of excessive quantities of asbestos fiber can produce a fibrosis in the lungs similar to that found in silicosis but somewhat milder and usually not so rapidly progressive. Like silicosis, the condition develops slowly and advances slowly and is equally resistant to treatment.

Prevention is essentially dust control. A maximum acceptable dust concentration of

5 million particles per cubic foot has been suggested, precisely as for pure free silica.

Barium, in the form of its soluble salts, is toxic on both ingestion and inhalation and highly caustic when applied to the skin. The carbonate and sulfide are sufficiently soluble to be toxic, although not very caustic. The sulfate, which is used as a contrast medium in X-ray work, is too insoluble to show any toxicity, and soluble sulfates are specific antidotes for ingested barium salts.

Since these salts produce violent stimulation of all muscle, upon ingestion they produce severe disturbances of the digestive system. After absorption, the barium salts produce an increase of blood pressure by constriction of the arterial muscle, a slow heart beat by an action similar to that of digitalis on the heart, and first excitation and then paralysis of the central nervous system. In spite of the high inherent toxicity, there are few cases of industrial poisoning with barium. The maximum acceptable concentration for soluble barium compounds is 0.5 mg/m.³

Barium is a heavy metal, and the dust of the insoluble salts will collect in the lungs and give rise to the condition known as baritosis. Its nodular appearance on X-ray film may be mistaken for that of silicosis. Men showing the sign of baritosis are apparently not disabled or inconvenienced in any way.

Benzene is a colorless, flammable, volatile liquid with a rather pleasant aromatic odor. Its fire hazard is between that of ethyl alcohol and that of ether. *The greatest hazard is that of chronic poisoning by inhalation of comparatively small amounts over a long period of time. It is one of the two or three most dangerous organic solvents in commercial use.*

The action is primarily on the blood-forming organs, producing severe anemia, bleeding under the skin, and great reduction in the ability of the blood to clot.

The extent of chronic exposure to benzene may be determined qualitatively by measurement of the ratio of organic to inorganic sulfates in the urine. The most convenient measurement of damage is given by a blood count.

People who may be exposed to benzene vapor should have blood counts at regular intervals. Consistent change in the blood count should be closely investigated. Par-

*"Arsine Poisoning, Epidemiologic Studies of an Outbreak Following Exposure to Gases from Metallic Dross," Louis W. Spolyar, R. N. Harger, *AMA Archives of Industrial Hygiene and Occupational Medicine*, 8:119-136 (1950).

"Arsine Poisoning in the Smelting and Refining Industry," K. M. Morse and A. N. Satterlund, *AMA Archives of Industrial Hygiene and Occupational Medicine*, 2:148 (August, 1950).

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ticularly significant changes are diminution in the total numbers of red cells, platelets, or white cells.

Headaches, dizziness, fatigue, loss of appetite, irritability, nervousness, nosebleed, and other signs of abnormalities of the blood may or may not be present in chronic poisoning.

A single heavy exposure to benzene vapor may produce a serious acute poisoning. In such a case the action is that of an anesthetic with special affinity for the central nervous system. The first sign is usually exhilaration, followed by sleepiness, dizziness, vomiting, trembling, hallucinations, delirium, and unconsciousness.

The main first-aid requirements in acute poisoning are removal of the person to fresh air, inhalation of oxygen, and maintenance of bodily warmth.

Skin contact with benzene should be avoided, partly because like other powerful solvents it produces dryness and cracking of the skin, but primarily because it will almost certainly entail excessive inhalation of the vapor. The maximum acceptable concentration is 25 ppm.

Benzene hexachloride—see Hexachlorocyclohexane.

Beryllium. Among the occupational diseases produced by beryllium, the first condition observed was an acute chemical pneumonitis, which occurred among workers exposed to beryllium compounds. This acute form of beryllium intoxication was first reported in this country in 1943 and was attributed largely to the fluorides.*

A delayed reaction to beryllium, characterized as chronic and appearing as late as two or three years after the exposure which caused it, was reported some time later by Hardy and Tabershaw.** Even more recently, Dr. Hardy has reported that the delay between last exposure to beryllium and the

*"Chemical Pneumonia in Workers Extracting Beryllium Oxide: Report of Three Cases," H. S. Van Ordstrand, R. Hughes, and M. G. Carmody, *Cleveland Clinic Quarterly*, 10:10 (1943).

**"Delayed Chemical Pneumonitis Occurring in Workers Exposed to Beryllium Compounds," H. L. Hardy and I. R. Tabershaw, *Journal of Industrial Hygiene and Toxicology*, 28:197 (1946).

appearance of symptoms may be as long as ten years.* This condition showed a granulomatous lesion of the lungs as the most striking effect, accompanied by general metabolic disturbances and anemia so that the individual had continuous weight loss and great weakness in addition to a chronic cough. A large number of cases of dermatitis attributed to beryllium and beryllium compounds have also been reported.

Although beryllium was thought in 1940 to be reasonably harmless, it has since been declared that:** "Not only is beryllium unquestionably a toxic agent but it is toxic in such small quantities as to be among the most toxic chemically of all elements yet investigated. As seen from analyses of tissues, responses have been brought about in animals with beryllium in quantities in the order of millimicrograms. Such small quantities require a reorientation in our toxicological thinking, and these amounts give rise to acute effects. It is reasonable from field survey evidence to believe that still smaller quantities produced the chronic disease in human beings and that 'safe' levels of beryllium exposure may ultimately be set well below one microgram per cubic meter of air."

It has also been established that a worker may carry home enough beryllium compound on his clothes to result in illness in some member of his family.**

Stokinger and his co-workers demonstrated that the presence of fluorine enhances the toxic action of beryllium.

Recommendations issued by the Atomic Energy Commission for the control of beryl-

*"The Disability Found in Persons Exposed to Certain Beryllium Compounds," Harriet L. Hardy, *AMA Archives of Industrial Health*, 12:174-181 (August, 1955).

**"Acute Inhalation Toxicity of Beryllium. I. Definitive Studies of Beryllium Sulfate at Exposure Concentrations of 150, 10 and 1 Milligram Per Cubic Meter," Herbert E. Stokinger, George F. Sprague III, Robert H. Hall, Norman J. Ashenburt, James K. Scott, and L. T. Steadman, *AMA Archives of Industrial Hygiene and Occupational Medicine*, 1:379-397 (April, 1950).

***"Current Knowledge of Beryllium Intoxication," H. L. Hardy, *Occupational Safety and Health*, International Labour Office, Geneva, Switzerland (April-June, 1958).



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