THE FORCES OF NATURE VERSUS THE TACTICS OF MAN

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The insurance industry has long recognized the value of efforts toward the reduction of the havoc wrought by earthquakes. By your leadership, countless lives and millions of dollars of property have been saved through a better understanding of the problems created by earthquakes. However, let us not overlook the other disasters of nature that concern mankind.

Nature in all her glory is beauty. The forces of nature harnessed provide power for the pursuits of mankind. But in her anger, nature can be havoc and destruction. The forces of nature turned destructive have brought untold misery to man the world round. These rampant energies pose serious problems for all of us.

I should like, in the next few minutes, to discuss the several forces of nature which have caused catastrophes for our people, the problems these disasters have put before the insurance industry, and how, through the various tactics of man, these difficulties are being faced.

Earthquakes

Earthquakes are of more frequent occurrence than is generally supposed. The historical record indicates that practically no part of the United States has been entirely free from such disturbances. Experience shows that in areas which have been visited by major earthquakes, a recurrence is more than likely, though the intervals between visitations may be a number of years.

Let us examine the area in which you are now meeting. We in California live on an unstable coast. It is a region of great topographic extremes, where mountain peaks reach elevations of 14,000 feet and over, within 75 miles of a depression whose floor is 275 feet below the level of the sea; where the huge range of the Sierra Nevada lies in fairly close proximity to the Pacific Ocean and the depths beyond the Continental Shelf.

Although this region may appear to be solid and substantial, it is often shaken by tiny tremors and at not infrequent intervals by stronger vibrations. This whole area seems to be in a state of unbalance, with readjustments constantly taking place. What causes these tremblings of the earth I am most certainly not qualified to relate. But rather I am here to discuss the concern which the insurance industry has in such earthquakes.

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In the late 1920's the insurance industry realized that a condition must be faced from which there was no escape. Earthquakes have occurred as far back as records have been kept; they will continue through our lifetime and into the future. Realizing this condition, the insurance industry rose to the cause by providing protection against financial loss of property by earthquake.

The term, "earthquake hazard," is often loosely applied. The statement is frequently made that a building is "earthquake proof" or "safe against earthquake," when all that could be expected or meant is that it will not collapse. An actual example will illustrate this situation. A 12-story building is subjected to a heavy shock. It does not collapse. From a distance, it appears to be only slightly damaged. Even the elevators continue to operate and the building remains occupied. And yet a closer and more detailed inspection shows the walls, partitions, trim and frame to be so loosened up and cracked that the damage is in excess of 50% of the original cost of the structure.

Earthquakes are the more destructive because man has made them so by erecting buildings which can be shattered and shaken down. Realizing this, the insurance industry, with the public's protection in mind, undertakes the insuring of property against damage by earthquake. Through the years, the original policy has been revised and today property owners can purchase insurance against financial loss from this kind of natural disaster.

Earthquake insurance is written in the United States under two sets of rules and forms. In the states of Arizona, California, Idaho, Montana, Nevada, Oregon, Utah and Washington, it is written under the jurisdiction of fire insurance rating bureaus. In this Pacific Coast territory, the usual method of providing protection is to extend the fire insurance policy to cover the earthquake hazard through a standard endorsement. However, such insurance may be written alone, without fire insurance, under another standard endorsement called the Earthquake Policy form, which converts the fire policy into an earthquake insurance contract. The attachable endorsement may be added only to a fire policy covering the same property. It extends the fire policy to cover earthquake damage in the same amount and does not add any additional amount of insurance. A deductible of at least 5% of the value of the property is required. A reduction in premium is allowed for the use of a larger deductible.

Outside of the eight Pacific Coast states mentioned above, earthquake insurance is written under a standard policy. The only difference between the coverage written in the two areas is that the Eastern policy, being a separate contract, provides an independent amount of insurance protection on the insured property.

Insurance only indemnifies the property owner against financial loss by damage. Man in his ingenuity can certainly develop other tactics to withstand the ravages of nature. Of course, the best method of preventing loss by damage is through adequate provisions in building design and construction codes which will eliminate many of the causes of damage.

In this field, too, the insurance industry has come to the fore. Typical of the industry's efforts is the work of its structural engineers and the establishment of a National Building Code by the National Board of Fire Underwriters. The purpose of the code is to provide for safety, health and public welfare through structural strength and stability. The provisions of the code apply to construction, alteration, equipment, use and occupance, location and maintenance of buildings and structures.

While dealing mainly with building regulations concerning fire protection, the code includes recommendations for earthquake resistant construction. The prime requisites in the construction of earthquake resistant buildings are strength, rigidity and workmanship.

Fire

In discussing the many problems connected with earthquakes and the insuring against damage caused, one must also consider their relationship to another catastrophe - - fire.

In the case of almost every earthquake, many fires are started in buildings damaged by the shock. Following the earthquake of April, 1906, in San Francisco, a conflagration developed which was not brought under control until the damage from fire was many, many times that of the earthquake. In Tokyo, in 1923, after the earthquake, a great fire swept over a large part of the city; the resultant loss of property was again far greater than that directly caused by the earthquake, and in the fire, tens of thousands of people lost their lives.

Unless adequate provisions are made to minimize the damage to buildings, it is a virtual certainty that a large number of fires will develop in any community subjected to a shock of the intensity of that which struck San Francisco in 1906.

It is of primary importance that all new buildings be so designed and constructed as to be capable of withstanding the shock of an earthquake of severe intensity, and it is of equal importance that all existing structures be strengthened so as to have like resistance to such shock. When buildings have been made strong enough to withstand earthquake shocks, the chance of serious fires will be little more than the hazard normally present in any congested area.

Every city should be provided with a supply of water from different sources. In order that no large area might be isolated from all sources of supply, there should be a number of distributing reservoirs so located that each section of the city is in effect supplied from a separate source. The entire distribution system should be equipped with valves so located that any broken main could be isolated and service continued through pipe lines around the break.

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In every community there is, of course, a fire department equipped to fight fires which occur from time to time. In order that such fire departments may be able to prevent a conflagration following a severe earthquake, all equipment and personnel should be located only in buildings which are resistant to fire and earthquake.

It must be recognized that earthquakes greater than moderate magnitude may occur at any time in this region, that a severe conflagration could follow such a disaster, and that, as a result, the damage might be increased tenfold. Therefore, it is most important that earthquake engineers and engineers of the fire insurance industry combine their efforts to bring about safe conditions in the earthquake areas.

Wind

Among other forces of nature which, when turned destructive, cause catastrophic conditions and the resultant serious loss of property and life are hurricanes and windstorms. The hurricanes which affect principally the South Atlantic and Gulf states of this country during the months of June to November, but occasionally strike as far north as New England are tropical cyclones originating principally in the Western Caribbean Sea. Tropical storms of this origin are accompanied by winds of high velocity and destructive force. The winds in a hurricane revolve counterclockwise and are inclined toward the center of the storm.

Knowledge of the wind effects on buildings has been greatly enhanced in recent years through wind tunnel tests on models. The winds in a hurricane are not steady. Tests have shown that as wind blows against a building it produces a positive pressure on the windward side, or on some portion thereof, but produces a negative or suction pressure on the other sides of the building. A common occurrence in hurricanes is for the wind to break a window or open a door on the windward side of a building; through this opening the wind enters the building and builds up a positive pressure on the underside of roofs or on the inner side of leaward walls which carries off a roof or forces out a leaward wall.

The American insurance industry, through the work of its trade associations such as the National Board of Fire Underwriters, has included in the National Building Code specifications for protection of existing buildings and special requirements for hurricane resistant construction. On the financial loss side of the problem, the industry has provided the public with the protection of insurance. Coverage against loss by windstorm is included in many inland marine "floaters" covering personal property. Several of the all-risk dwelling policies include coverage against such damage. The standard fire policy may be broadened to include windstorm through the Extended Coverage endorsement. Under this endorsement, windstorm coverage does not include damage by frost, cold weather, waves, tidal waves and high water. In a number of states, a deductible clause, usually $50., applies to these losses. It may, however, be removed for an additional premium.

In addition, there is a specific windstorm policy for other than farm property. It indemnifies the insured for loss of or damage to specific property resulting from wind. The use of a deductible is prescribed in areas where storm damage is consistently heavy. A deductible is not required in the Middle West and Pacific Coast.

Flood

Through the years, the business of insurance has earnestly sought ways and means of providing insurance coverage against loss or damage resulting from natural occurrences. The insurance industry has to a large extent been successful in meeting the challenges of nature. One important exception is flood.

The problem of floods began with the earliest days of man's history and will continue, an unfinished saga, until the last chapter in the world's existence has been written. Disastrous floods are invariably the result of excessive rainfall, rapid melting of accumulated snow, failure of reservoirs, breaking of ice jams or the breaking of levees. Nearly all major floods have been caused by an excess of rain augmented by snow lying in the ground at the time warm rains occur. Floods of this type are apt to be recurring because, indefinite as it may be, there is some semblance of consistency in meteorological phenomena, and heavy rains are to be regularly expected within certain rather generally defined areas.

Even though flood has been one of the oldest threats historically confronting human endeavors, the insurance business has not yet been able to devise a method of providing specific flood insurance coverage within the bounds of sound insurance principles.

It would be misleading to leave the impression that insurance companies are entirely free of exposure to loss from flood. To the contrary, there are flood loss potentials of catastrophic proportions under various forms of existing insurance. For example, practically all motor vehicles are insured under a comprehensive coverage which includes damage resulting from flood. Then, too, so-called inland marine insurance policies insuring merchandise in transit or on consignment usually include flood coverage. This is equally true of certain types of all-risk policies which insure bridges, tunnels, contractor's equipment, jewelry, furs, objects of art, and certain personal property.

While a flood can be defined in a variety of ways, generally the term flood is loosely used. A flood is sometimes regarded as a condition caused when a stream overflows its banks, but the damage from the effects of water is just as real from wind driven tides, tidalwaves, high water from excessive precipitation in areas far removed from streams or rivers, mud flows and the like. It would be difficult, for insurance purposes, to maintain a narrow definition of flood, yet an all embracing definition that would include any kind of inundation would present a variety of complications.

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When we speak of floods and flood insurance, we have in mind an estimated 10 million people who live on 50 million acres of ground susceptible to flood. Hydrological engineers predict that on the East Coast, if there should occur an unusually high seasonal tide coincidental with an astronomical tide, and further backed up by a hurricane with a force equal to that of last year's Diane, the highest known water level would be exceeded by 26 feet wherever this concentration of nature's forces happened to hit. Imagine the damage such high water would do to a land area such as Manhattan Island.

Such an occurrence is only a possibility, not a probability, but this prediction must be taken into consideration when discussing the flood insurance problem.

Damages to property caused by floods are generally classified in two groups: direct losses and indirect losses. Direct losses consist of physical damage to property and goods, measured by present day cost of repair or replacement in kind, and the cost of cleanup and moving goods. Indirect losses consist of the value of service or use which is lost or caused by flood conditions. This includes loss of business and wages and costs of relief and similar expenses.

It has been estimated by a Federal agency that the average annual flood insurance loss would be approximately $150 million. This figure was reached by averaging out the annual flood losses of the past 30 years and then applying various considerations to the 30-year average. However, most observers believe this $150 million estimate to be on the low side.

In view of this estimated $150 million annual loss, consider the premium collection problems. Even during the World War II emergency, the War Damage Insurance Corporation was able to collect in two years only $280 million in premiums on a country-wide basis, with two more years of War Damage coverage added at no extra cost. With flood damages estimated at $150 million annually, it would seem that a government insurance plan would be hard pressed for premiums to cover losses.

The Federal Government has operated at least 15 insurance or similar programs unrelated to floods, many of which began when private business doubted their workability. A typical example of the difficulties of a Federal plan is the Federal Crop Insurance Corporation, which even though limited in scope, has shown an underwriting loss of over $7 million since it was started in 1939. And this loss does not include the millions of dollars of administrative costs which were borne by congressional appropriation.

Even if specific flood insurance could be provided at a reasonable premium cost, experience has indicated that no one would buy it except those whose properties are exposed to the possibility of loss. If flood insurance were to be undertaken without unfair discrimination, it would be necessary to have not only a complete hydrological survey of each

river basin and flood area in the country, but also a detailed hydrological study of each "reach" of every river, and, in addition, a detailed survey and appraisal of each property to be insured. It is obvious that the expense of rating properties for flood insurance would be considerable, and perhaps in many cases would be prohibitive. To attempt to distribute the cost of specific flood insurance among all insureds regardless of their exposure would be manifestly inequitable.

At the present time there is legislation, passed by the United States Senate, pending before the House of Representatives that deals with the flood insurance problem. This bill creates a Federal flood insurance administration which shall provide, upon such terms and conditions as may be necessary, insurance and reinsurance against loss resulting from damage to or destruction of real or personal property due to flood. The Administration is authorized to establish a schedule of estimated rates for insurance which would be adequate to produce sufficient proceeds to pay all claims over a reasonable period of years. Such estimated rates shall not include any loading for administrative expenses of the Federal Government. In addition, a schedule of fees will be established to provide insurance at reasonable costs designed to achieve marketability. An amount equal to the difference between the fees charged and the amount which would have been charged if the estimated rates were applied will be paid into a Disaster Insurance Fund by the Administration. Under the bill, policy maximum is $250,000, per person, maximum on any one dwelling unit is $10,000, and each policy carries a $100 deductible plus a deduction of 5% of the remainder of the face of the policy. The bill provides for a maximum of $3 billion insurance, which may be increased to $5 billion.

In the event it is determined to provide specific flood indemnity by subsidy, the complete facilities of the insurance industry will be at the Government's disposal. However, it is certain that the insurance industry is not entering the flood insurance field. To summarize the flood insurance problem, I should like to present those questions most frequently asked, and attempt to answer them.

(1) Why is the writing of specific flood insurance on fixed location properties unsound?

The insurance companies believe that specific flood insurance covering properties in areas subject to recurrent floods cannot be feasibly written because of the virtual certainty of loss, its catastrophic nature, and the reluctance or inability of the public to pay, year in and year out, the premium charge required to make the insurance self-sustaining.

(2) Would the writing of flood insurance be feasible if the peril of flood were made a mandatory coverage?

There is no way in which the purchase of flood insurance can be made mandatory consistent with our American concept of free government and competitive selection. If the purchase of flood insurance were made mandatory, the public would be required to pay for coverage even though they might not be subject to the hazard.

(3) Wouldn't companies write flood insurance if it were thought they could be consistent with good business practices?

Certainly, companies would write the cover if they thought such a course feasible. Examples of this eagerness to provide every form of protection are to be found in the broad form policies which do not exclude the peril of flood.

(4) What does the insurance industry believe to be a realistic long-range approach to the flood damage problem?

The industry believes that flood control and prevention rather than insurance, indemnity or relief will be of far greater importance to potential flood victims especially when the many other aspects such as death, bodily injury, loss of employment, loss of income, etc., are taken into consideration.

While the exposure of insurance companies to flood damage loss under the various broad form insurance policies is considerable, probably the most serious flood exposure insurance companies presently have is under the standard fire insurance policy in the event a fire or conflagration accompanies a flood. At such a time fire fighting facilities are either impaired or unable to function at all. Even though flood might be the proximate cause of the fire or conflagration, the exposure to catastrophic loss under fire policies is very substantial.

It is through its service organizations, individually and jointly, that the insurance industry plays an active and important role in the great recurring drama of the flood. Perhaps there is no better exemplification of how organizations formed primarily to serve the interests of the insurance industry, have become quasi-public in their nature than consideration of their activities during time of emergency. Property owners through years of contact have come to look upon the rating and inspection bureaus and upon similar trade associations as authentic sources of help. City officials, fire chiefs, superintendents of waterworks have come to realize that through its engineering services the insurance industry can be counted upon to bring judgment and a nationwide experience in facing, with them, the unusual and difficult problems raised by floods.

Atomic Energy

I have spoken to some extent on the catastrophes caused by the forces of nature which we have experienced since the beginning of time. I would now like to point out that the battle against these forces of nature turned destructive is by no means resolved. In its efforts to keep abreast with the ever expanding requirements of the insuring public, the business of insurance is continually experimenting with and producing new forms of coverage. This is especially true as new perils are introduced by new products and new processes of manufacture. In the near future, and to a degree today, a new and serious problem is facing the insurance industry and the Federal Government in the United States - - the probability of and protection against catastrophic loss caused in the peacetime use of atomic power.

Our traditional competitive-enterprise system and our technological advancement could not have been possible without some safeguarding of our economic incentives. As science progressed through industrial application of its fruits, the protective coverage of insurance advanced with it, meeting an ever-increasing variety of situations that accompanied every major economic advancement.

The problem of protecting physical and business assets in connection with current private efforts in atomic energy developments presents a special challenge to both the engineering profession and the insurance business.

We are now entering a new, rapid growth cycle in our expanding technological era where hazardous materials are being used in extremely large quantities and with processing operations that are being conducted at increasingly higher temperatures and pressures with a greater and greater volume of dangerous products. More and more of these processes are being classified in the extra hazardous category. However, it is recognized that in well managed modern plants having such high order of calculated risk, there is compensation in good technical know-how to the extent that the financial risk, because of controlled accident potentials, is quite often considered not too excessive. Such industrial systems are favorably regarded as insurable.

Atomic energy is already a growing major American industry. The Army has asked for bids on 1,000 small reactors and already 30 firms have qualified and been certified as capable of producing such reactors. In the medium-sized reactor field, there are several such reactors already authorized and under construction, and this field will expand rapidly. The large electric power reactor program is already activated. Altogether, there are 22 companies who have committed themselves for an aggregate of over $250 million of their own capital for participation in this program.

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To review properly the insurance problems created by the expanded industrial participation in the development of atomic energy, a special group of insurance executives was organized with the cooperation of the Atomic Energy Commission to conduct a study of the insurability of industrial operations employing atomic energy. The preliminary report released last year contained the following conclusions concerning the problem.

The catastrophe potential, although more serious than anything now known in industry, is remote in occurrence. This is because of progress in developing controls to prevent a dangerous incident, as well as engineering design for containing any released radioactivity in event of leakage or reactor failure.

Research and commercial reactors are insurable at commercial rates, and they might be considered in the category of the more hazardous types of chemical operations.

The most serious problem, as to amount of insurance available, lies in the "third party liability" coverage, where the insurer might be faced with catastrophe potentials, facing claims of an extreme magnitude for property losses in the immediate surroundings, decontamination, and workmen's compensation losses from other plants and from public damage in the general area adjacent to atomic reactor sites.

Insurance covering business interruption and use and occupancy present a special problem requiring further consideration.

It was concluded by the group of experts that an agreeable maximum limit of primary liability can be worked out, but as a matter of policy, it should be the Government's decision and responsibility whether or not to create a special Federal fund which would provide a means of insurance in excess of the capacity of the commerical market.

To promote the insurability of atomic enterprises, it is considered necessary that the activity of an overseeing technical body, such as the present Reactor Safeguards Committee of the Atomic Energy Commission, should be continued and that current safety standards be rigidly maintained.

To apply a realistic safety program to commercial developments, the following suggestions should be considered: site selection or location of the actual nuclear power plant and possible involvement of adjoining and distant industrial properties with dangerous exposure of the public at large. Consideration must also be given to such factors as meteorological conditions and the surrounding terrain, including the occurrence of so-called Acts of God, such as lightning, floods, windstorms and earthquakes.

Taking the first step forward in solving these difficulties, more than 110 of this country's insurance companies have been organized to insure industry operated nuclear reactors against radiation liability. It is expected that this organization, Nuclear Energy Liability Insurance Association, will be in a position to insure each reactor for $50 million. The insurance provided will cover the construction, installation, operation and maintenance of nuclear reactors used for industrial, commercial research and experimental purposes. The coverage will be third party liability, insuring against bodily injury and property damage to persons other than the reactor owner or operator.

More recently, 150 companies organized the Nuclear Energy Property Insurance Association to indemnify industrial users of nuclear energy against property loss. The initial aim of the group is to have enough capacity available to insure any reactor now planned. Tentative commitments indicate a capacity in excess of $50 million for each installation for property damage.

In addition, the United States Congress has been asked by the Atomic Energy Commission to establish a $500 million insurance and reinsurance fund to provide indemnity against liability losses. In the word of Lewis Strauss, Chairman of the Atomic Energy Commission, $200 million of property damage could be expected from a runaway or breakdown of an atomic reactor.

Much of the confusion that now exists will vanish in time with constructive thinking. Industrialized atomic energy can then be properly evaluated as an insurance risk, with adequate coverage against major accidents and catastrophes. Every branch of professional endeavor is duty bound to master its skills and resources for the fullest exploitation of the unbounded energy of the stem. With proper cooperation from such human, financial and technical talents, and the establishment of equity of responsibility among government, industrial and insurance interests, we can move forward and hasten the day when peacetime atomic power becomes a reality.

I have discussed, at some length, the difficulties caused by the catastrophes of nature and its companion, nuclear fission, with which the insurance industry is confronted. I have not touched upon the similar problems in other countries - - not because such problems are non-existent - - but rather because I am not qualified to speak on the foreign countries some of you gentlemen represent.

However, regardless of location, the forces of nature turned destructive pose serious problems. Basically, every country has earthquake and the like disasters, and each, whether it be Japan, Italy, Chile or any other nation, has similar difficulties in the prevention of loss and restoration of property. From a humanitarian standpoint, we must make an attempt to resolve these problems - - to provide for the well being and safety of the people of the world.

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And it is indeed encouraging to witness a gathering such as this today. For if you can bring about a better understanding of the forces of nature, much of the destructive force will be reduced.

In the final analysis, it must be recognized that the destructive forces of nature cannot be eliminated - - they can only be minimized by the tactics of man.