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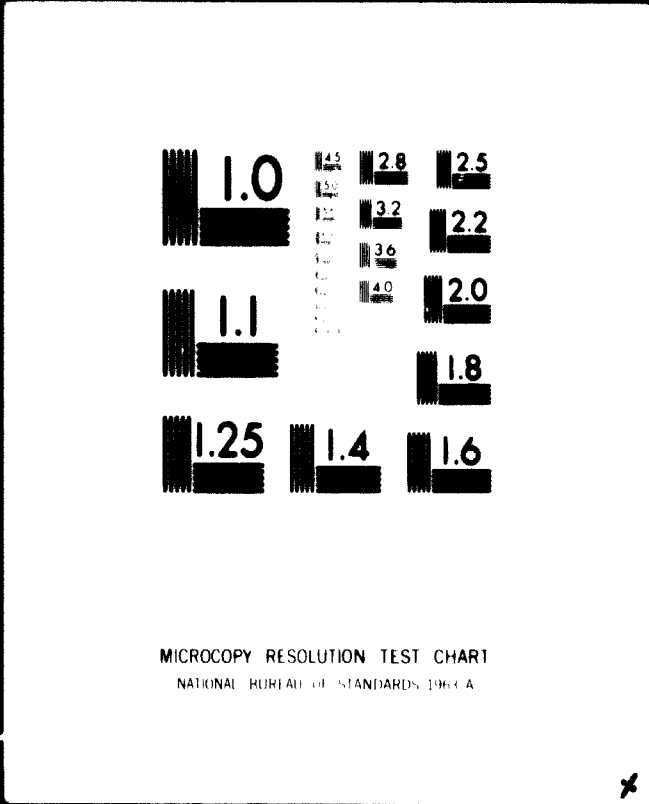
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**Technical Seminar on Contracting Methods and
Insurance Schemes for Fertilizer and Chemical
Process Industries**

Lahore, Pakistan, 25 - 29 November 1977

**TECHNICAL SEMINAR ON CONTRACTING
METHODS AND INSURANCE SCHEMES
FOR FERTILIZER AND CHEMICAL
PROCESS INDUSTRIES**

by

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FERTILIZER AND CHEMICAL PROCESS INDUSTRIES -
CONTRACTING METHODS AND INSURANCE SCHEMES:

1. The object of this paper is to discuss in brief the possibility of providing insurance schemes for compensation for consequential losses.
2. Risk is incidental to any industry and more so, with chemical industries, because of the hazardous nature of the process.
3. I would, for the purpose of this paper, classify the risks into 2 sections, one, losses that can happen after the plant is commissioned and two, losses that could occur before the commissioning of the plant.
4. Losses that can occur can again be classified into 2 sections namely, direct losses and consequential losses.
5. Let me first deal with the type of losses that can happen after the plant is commissioned.
6. The major direct hazard, of course, is fire, the hazards of chemical factories are determined by the hazardous properties of the chemical being processed and by the method of processing, generally, chemical processes are classified into two groups - heat absorbing and heat releasing (endothermic and exothermic).
7. In heat releasing processes the hazard is the maximum pressure to which it will be normally subjected to, some typical examples of heat releasing processes (exothermic) are (A) chlorination, (B) hydrogenation (C) nitration (D) oxidation (E) reduction, etc.
8. In heat absorbing process (endothermic) the main hazard is the source of heat which in itself may be an ignition source or may cause too rapid a reaction if excessive heat is applied for some reason. Some of the common heat absorbing processes are (A) alkylation, (B) distillation, (C) solvent extraction (D) sulfonation, etc.

2. On the basis of the nature of process and the hazards involved, a fire insurance policy covering almost all eventuality can be obtained by the plant owner, this policy, of course, will cover only the material damage, i.e., damages or destruction caused to plant, materials, buildings, stocks, goods in process, etc., as a result of fire, the standard fire policy will indemnify the plant owner to the extent of his actual material loss.
10. But what happens when fire is put out and the fire engines have driven away. Of course, the plant owner will get his money for the loss sustained but with that money he will not be able to restart the operations overnight, depending upon the intensity of the fire, it may take months, if not years, to rebuild the destroyed plant, during that period, he will have to incur standing charges of various nature such as wages, interest on loans, etc., besides the trading loss he suffers, as a result of reduction in turnover. It is here that the consequential loss policy comes into play. A consequential loss policy covers the owner in respect of loss of profits as a consequence of fire. This is generally measured in terms of reduction in turnover. Thus, the consequential loss policy affords protection against losses incurred as a result of the fire.
11. However, losses can occur due to causes other than fire, the owner can incur losses as a consequence of breakdown of machinery, the plant owner can take out a policy for machinery breakdown and also a consequential loss policy attached to the machinery breakdown policy, the benefits as a consequential loss policy (machinery breakdown) are similar in nature to that of a fire consequential loss policy, this policy will indemnify him against consequential loss as a result of machinery breakdown.
12. Now let me go back to the losses that can occur before the actual commissioning of the plant. The risks commence right from the time the purchaser enters into negotiations

with the contractor for the purchase, erection and commissioning of the intended plant.

13. Once a contract is awarded, the purchaser faces the risk of the bidder unable to proceed with the contract. The second risk he faces is the insolvency of the contractor during the course of the contract period, the next risk is the performance of the contract in accordance with the terms and condition agreed upon, to secure himself fully against the above losses, the purchaser should specify in the contract the following conditions:
 - A) Insurance policy covering erection all risks, in the case of machinery breakdown.
 - B) Insurance policy covering contractors all risks.
 - C) Performance guarantee policy.
14. Of course, one of the major exclusions in all standard policies covering contractors all risks is the exclusion of consequential loss liability of any kind or liquidated damages or penalties for delay or detention.
15. However, if the exact nature and cause of consequential losses can be determined and quantified, a suitable form of cover could be worked out, to enable the underwriters to arrive at a suitable premium, a lot of additional information is required.
16. Once a model contract form is arrived at, it can be examined from the underwriter's point of view as to how far the liabilities of the contractor could be taken up by the insurer.
17. As mentioned earlier, to provide a cover for consequential loss due to delay, detention or other causes, the underwriter would like to have the following information:
 - (I) Whether the consequential losses that can occur is capable of being quantified.

- (II) If so, the basis on which the losses could be calculated.
- (III) The specific causes as a result of which the purchaser will suffer consequential losses.
- (IV) Details of past failures if any, and losses suffered by the purchaser - specific details of contracts, reasons for failures and the consequential losses suffered by the purchaser should be furnished.

Once these details are available, a form of insurance against these risks could be worked out.

- 18. I would imagine that the value involved will be substantial and therefore, a consortium of insurers from the developing countries could be formed to provide the cover and arrange for reinsurances, etc.
- 19. A model insurance scheme for chemical plants is enclosed as annexure 'A', this scheme will cover most of the present day requirements of the plant owner.
- 20. However, as contracting methods undergo changes so do the insurance requirements and there is always the need for a continuous dialogue between the contractors, purchasers and underwriters, so that additional protection can be provided by the insurers to the contractors as well as the purchasers.

I. Varkey,
22nd November 1977,
Kuala Lumpur.

**MODEL INSURANCE SCHEME
FOR
CHEMICAL PLANT**

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SUGGESTED COVERS UPTO THE TIME
OF COMMISSIONING THE PLANT

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MARINE CUM ERECTION

This type of insurance is very important at the time of Erection and commissioning of the plant. It is quite possible that there will be machinery imported from various parts of the world to the work site and the erection might commence only after all the important items of machinery and parts have arrived. During this period you will have to store the goods that have arrived. By taking out a Marine cum Erection policy all your consignments from wherever sources they come are covered against Marine risk during transit, and storage and also the normal erection risk during the specified period of erection.

This policy also covers the Testing Period. This will be the most convenient form of insurance as otherwise each and every consignment when it is shipped has to be separately intimated and separate policy taken out.

In this combined policy the goods are covered against theft and burglary during the storage period and damages during erection time. There will be an excess on each claim depending upon the type of machinery imported. This will normally be \$1,000/- per claim and \$2,500/- per claim during Testing Period.

CONTRACTORS' ALL RISKS INSURANCE

The Contractors' All Risks Insurance is a form of comprehensive cover protecting a building/structure under construction or a civil engineering project against accidents resulting in a physical loss or damage to works in progress, constructional plant and equipment or construction machinery on the site.

The CAR policy caters for contracts where the Major portion of the risk relates to civil engineering works (e.g. erection of buildings/structures, drainage schemes, road or railway construction, bridge building, etc.)

Cover attaches from commencement of the work at the site until the contract works are completed and taken over by the principal or put into service, whichever is earlier. To meet contract requirements the CAR policy also provides cover during maintenance period (normally upto 12 months) after completion of the works and any damage caused by an act or omission on the part of the Contractor's personnel during this period would be indemnifiable under the policy. However, maintenance cover is exclusively in respect of loss or damage arising out of performance of guarantee work. The cover would not extend to guarantee the work.

The following may be insured under the CAR policy:

- (a) Civil engineering contracts, e.g. roads, reservoirs, embankments, barrages, dams, canals, irrigation and water supply systems, drainage and sewage systems, tunnels, air-fields, runways, concrete bridges, etc.
- (b) Construction work in connection with power stations, ports, wharfs, etc.
- (c) Metal structures including metal bridges, pipelines, tanks, gas-holders, furnaces and civil construction works, etc.

- (d) Dwelling houses, flats, offices buildings, warehouses, hospitals, schools, churches, theatres, factories, silos, etc.
- (e) Constructional machinery such as mobile cranes, pumps, graders, excavators, pile drivers, dumpers, vibrators, concrete mixers, bulldozers and other earth-moving equipments.

The policy covers "all risks" arising out of the execution of civil works and includes:

- (a) Accidental damage and loss or damage resulting from faulty material and workmanship.
- (b) Burglary, theft and malicious damage.
- (c) Earthquake, floods, inundation, subsidence and landslide.
- (d) Fire, lightning, explosion, storm and tempest.
- (e) Riot and Strike.
- (f) Loss of or damage to constructional plant (excluding breakdown and explosion of such plant).
- (g) Maintenance visits cover for a period from 3 to 12 months as may be required.
- (h) Third party personal injury and property damage risks.

The following are the principal exclusions:

- (1) War, Civil War, Warlike Perils and Nuclear Risks.
- (2) Wear and tear, rust mildew and other deterioration.
- (3) Penalties for delay or guarantees of performance and consequential loss.

- (4) Inventory losses.
- (5) Defective design.
- (6) The cost of repairing parts which are faulty in material or workmanship.
- (7) Wilful acts or omission of the Insured, total or partial cessation of work.
- (8) Breakdown or explosion of constructional plant and equipment.

It is customary for the Insured to bear a small share of each and every claim for his own account which serves to eliminate minor claims, the cost of which is disproportionate to the handling charges involved.

Differential excesses apply for loss or damage occasioned by major element perils and other causes.

Higher excesses are recognized by a suitable reduction in the rate.

ERECTION ALL RISKS INSURANCE

The CAR policy amongst the many forms of insurance in demand at the present time is that covering machinery during storage, erection and testing. The contractor supplying new machinery is usually responsible for loss or damage while he is installing and testing it, until the project is handed over to the principals. The principals, themselves also have responsibilities from the time the machinery arrives at their site/premises - whether it be a single small machine or a large manufacturing complex.

During these operations, the machinery is exposed to loss and damage from many causes such as fire, storm, impact, erection, accidents and explosions. The Erection policy provides a comprehensive insurance.

Coverage are most frequently arranged with contractors or manufacturers/suppliers of machinery when they are responsible for its safety, insurance being adapted to the particular needs of the contract. Insurances are also provided for purchasers of machinery i.e., principals and other interested parties.

The insurance covers loss of or damage to the insured machinery from any cause while it is on the contract site from the completion to unloading, during construction, erection and thereafter until the completion and testing.

Insurance is on all "All Risks" basis and includes:

- (a) Accidental damage during assembly and erection, e.g. faulty manipulation, dropping or falling, breakage of slings.
- (b) Collapse, collision, impact, burglary, theft and malicious damage.
- (c) Electrical and mechanical breakdown during testing of new plant and machinery.

- (d) Fire, lightning, explosion, storm and tempest.
- (e) Damage due to defects in material casting and workmanship (but costs incurred in rectifying the defect are always excluded).

It is also possible to cover extraneous perils like Riot and Strike damage, Earthquake, Flood, Inundation, Subsidence, Landslide and Cyclone or any of them on payment of appropriate additional premium.

The policy can also be extended to cover Third Party liability arising out of the erection operation, a extra cost of overtime rates of wages, express delivery, etc., in connection with repairs/replacements indemnifiable under the policy, damage to the Insured's surrounding property as a result of the erection operations costs incurred in the clearance and removal of debris following an event giving rise to a claim under the policy and the contractor's tools and erection equipment.

It is a standard practice to apply an excess to claims as neither the client nor the insurer wishes to be troubled with handling small losses, minor mishaps are inevitable on a contract site.

To comply with a client's wishes, higher excesses as may be applied, with a suitable reduction in premium. The insurer, too may wish to impose higher excesses for underwriting reasons especially during testing of major machinery.

PUBLIC LIABILITY INSURANCE

The Indemnity provided under this policy is in respect of third party claims, subject to the limits of Indemnity, as indicated in the policy, which the Insured shall become liable at law to pay as compensation for:

- a) Accidental bodily injury to or disease contracted by any person.
- b) Accidental loss or damage to property.

caused through the fault or negligence of the Insured or his employees whilst actually engaged in the Insured's business upon or about the premises by reason of any defects upon or about such premises or in connection with the delivery of goods for the Insured.

The policy is also extended to cover all costs and expenses of litigation recoverable in respect of any claims covered under the policy.

FIRE INSURANCE

The basic cover provided by the standard Fire Policy is loss or damage caused by fire or lightning.

The policy can be extended to cover the following additional perils:

- a) Riot, Strike and Civil Commotion.
- b) Malicious Damage.
- c) Aircraft Impact Damage.
- d) Explosion.
- e) Earthquakes, volcanic eruption, hurricane, cyclone, typhoon, windstorm and floods.
- f) Capital Addition Clause.
- g) Stock Declaration.
- h) Automatic Reinstatement of sum insured.
- i) Temporary Removal Clause.
- j) Electrical Installation Clause.
- k) Other contents Clause.
- l) Mortgage/Chargee.
- m) Licence Warranty.

The property may be insured for the current replacement cost or less depreciation over the period for which the property has been in use.

As for stocks the policy could be based on a declaration basis. In the event of the sum insured being less than the amount at risk at the time when the fire occurs, the insured's claim would be proportionately reduced. To maintain full insurance on stocks, it would be necessary to insure for the maximum value likely to be at risk at any one time. Under the declaration clause the stocks must still be insured for the maximum value likely to be at

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risk, but the premium is charged on the average value at risk as declared monthly. Since this value will usually be somewhat less than the maximum value likely to be on risk the initial premium is collected on the basis of 75% of the sum insured.

CONSEQUENTIAL LOSS INSURANCE

The consequential loss policy can be extended to cover Gross Profits and other Specified Standing Charges such as the following items:

- 1) Salaries of:
 - a) Officers.
 - b) Employees whose services must necessarily be continued.
- 2) Advertising
- 3) Taxes and Rates
- 4) Insurance Premium
- 5) Interest on indebtedness
- 6) Rent
- 7) Electricity Energy and/or Power Charges
- 8) Membership fees
- 9) Directors' fees
- 10) Postage expenses
- 11) Telegraph & Telephone expenses
- 12) Professional services and Auditors fees
- 13) Depreciation on buildings, fixtures, fittings, machinery, plant & equipment.
- 14) Printing and Stationery
- 15) Company's Contribution to Provident/Gratuity Fund.
- 16) Travelling and entertainment expenses.
- 17) Miscellaneous standing charges not specified (the amount of this item not to exceed 5% of the total insurance)

Indemnity is provided in respect of these items as a consequence of loss resulting from interruption or interference in accordance with the provisions of the Policy as a result of fire or lightning or such other perils as covered under the policy.

The definition of GROSS PROFIT is the Sum produced by adding to the Net Profit the amount of the Insured Standing Charges, or if there be no Net Profit the amount of the Insured Standing Charges less such a proportion of any net trading loss as the amount of the Insured Standing Charges bears to all the Standing Charges of the business. By net profit is meant the net trading profit (exclusive of all capital receipts and accretions, and all outley properly chargeable to capital) resulting from the business of the Insured at the premises after due provision has been made for all Standing and other charges including depreciation.

Normally the Indemnity Period will vary from 6 to 12 months.

ENGINEERING INSURANCE

Machinery Breakdown Policy

The Machinery Breakdown Policy will provide maximum protection for all plant and machinery.

The policy would cover against damages to machinery itself as a result of sudden and unforeseen damage to the machinery from such cause as faulty material, vibration and maladjustment, failure of lubricants, loosening of parts, excessive electrical pressure, failure of insulation, short circuit, open circuits or arcing, failure of other connected machinery or protective device, lack of skill, carelessness of operators, collision, obstruction of entry of foreign bodies, etc.

Loss of Profits following Machinery Breakdown

Damage to machinery may seriously affect the Insured's business. A loss of profits (Machinery) policy would protect against resulting loss of business. The expediting expenses extension may then be superfluous (subject to the effect of the time exclusion chosen) to the extent that the extra costs would be dealt with under the Profits policy as "increase in cost of working".

Insured's surrounding property (or that for which they are responsible):

This may be insured against damage following accident covered by the Machinery Breakdown policy e.g., by flying fragments from the broken down machine, excluding fire.

Third Party Liability

Damage to third party property or injury to persons of third parties following accident covered by the Machinery Breakdown policy may be insured as an extension.

Deterioration of goods in a cold store as a result of breakdown of refrigerating plant may also be covered by means of a separate policy.

SUMMARY

A model insurance scheme for a chemical plant should consist of the following cover:

(a) Suggested Covers upto the time of commissioning the plant.

(1) Marine Cum Erection

- (a) Marine all risks cover
- (b) Storage
- (c) Erection all risks
- (d) Testing

(2) Contractor's All Risk

- (a) Accidental damage and loss or damage resulting from faulty material and workmanship
- (b) Burglary, theft and malicious damage
- (c) Earthquake, flood, inundation, subsidence and landslide
- (d) Fire, lightning, explosion, storm and tempest
- (e) Riot Strike and civil commotion
- (f) Loss of or damage to constructional plant
- (g) Maintenance cover for a period from 3 to 12 months as may be required

(3) Erection All Risks

- (a) Accidental damage during assembly and erection e.g. faulty manipulation, dropping or falling, breakage of slings
- (b) Collapse, collision, impact, burglary, theft and malicious damage
- (c) Electrical and mechanical breakdown during testing of new plant and machinery
- (d) Fire, lightning, explosion, storm and tempest
- (e) Damage due to defects in material casting and workmanship (but costs incurred in rectifying the defect are always excluded)
- (f) Riots and Strike damage, Earthquake, Floods, inundation, subsidence, landslide and cyclone

(4) Public Liability

- (a) Accidental bodily injury
- (b) Accidental loss or damage to property

(b) After the plant is handed over

(1) Fire Insurance

- (a) Fire and lightning
- (b) Riot, Strike and civil commotion
- (c) Malicious damage
- (d) Explosion
- (e) Aircraft impact damage
- (f) Earthquake, volcanic eruption, hurricane, cyclone, typhoon windstorm and floods
- (g) Capital Addition Clause
- (h) Stock Declaration
- (i) Automatic Reinstatement of sum insured
- (j) Temporary Removal Clause
- (k) Electrical Installation Clause
- (l) Other contents clause
- (m) Mortgagee/Charges
- (n) Licence Warranty

(2) Consequential Loss

On gross/net profits and other specified standing charges as a consequence of loss or damage resulting from such interruption or interference as a result of fire, lightning and other perils as indicated above.

(3) Machinery Breakdown

The insurance is against unforeseen and sudden damage to the insured machinery from such causes as:

- a) Faulty material, design, construction or erection
- b) Vibration, maladjustment, misalignment
- c) Defective, lubrication, loosening of parts, abnormal stress, molecular fatigue, self-heating, centrifugal force.

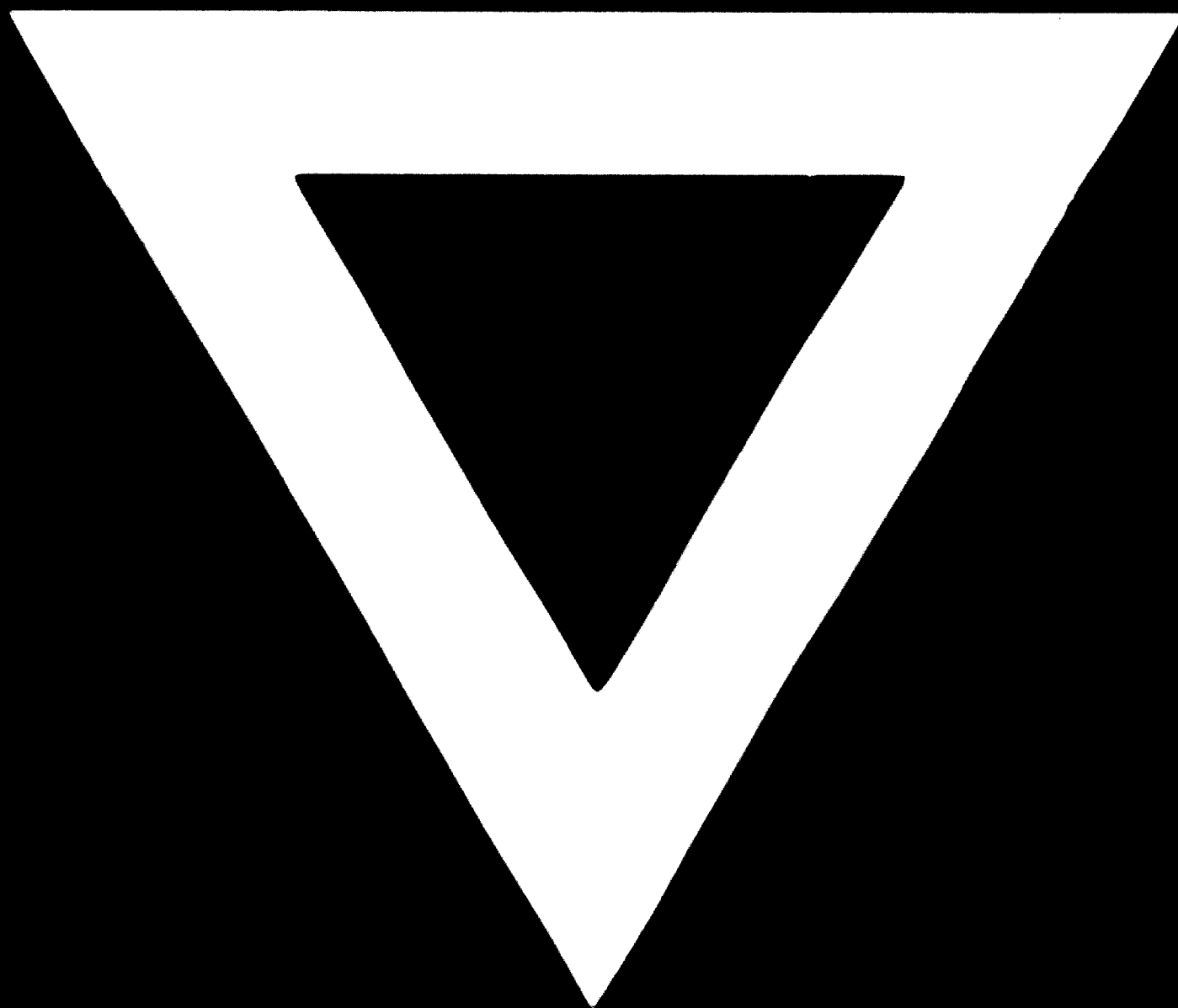
- d) Excessive electrical pressure whether due to atmospheric electricity or otherwise
- e) Failure of insulation, short circuits, open circuits or arcing
- f) Failure of connected machinery or protective devices
- g) Lack of skill, carelessness or malice of persons whether in the Insured's employ or not
- h) Felling, impact, collision and the like
- i) Obstruction of the entry of foreign bodies

(4) Consequential loss following machinery breakdown

Coverage as indicated above in (3).



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