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THE SUCCESSFUL CONSTRUCTION AND OPERATION OF
FERTILIZER PLANTS ^{1/}

Current practice as regards contracts; ways to improve contract
procedures; and the possibility of providing insurance
cover for consequential losses

Background Paper

prepared by

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^{1/} This paper was prepared for the Negotiations Section of UNIDO following the recommendation of the First Consultation Meeting on the Fertilizer Industry that this subject be examined in depth by UNIDO. It will be one of the background papers that will be submitted to a Working Group on Contracts and Insurance that will be convened by UNIDO prior to the Second Consultation Meeting.

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PREFACE

The Lima Declaration and Plan of Action, adopted in March 1975, recommended that UNIDO establish a system of consultations at the global, regional and sectoral levels. UNIDO was also requested to provide a forum for the negotiation of agreements in the field of industry between developed and developing countries and among developing countries.

The First Consultation Meeting on the Fertiliser Industry was held on 17-21 January 1977 and was attended by representatives of Governments, industry, labour etc., from more than sixty countries. Paragraphs 37-39 of the Report of the Meeting (ID/WG.242/8/Rev.1) are particularly relevant to the subject of this paper.

37. On the question of transfer of technology and purchase of equipment and services, the Consultation Meeting recognised that there were occasions when fertilizer plants and specific items of equipment had not functioned adequately, and buyers had suffered high consequential losses. It was further noted that the protection given by penalty clauses in international contracts was inadequate protection against consequential losses.

38. The Consultation Meeting examined the proposal made by UNIDO to investigate the possibility of setting up a multi-lateral insurance scheme covering consequential losses. The Meeting supported the intentions underlying the scheme but realised that practical difficulties might arise in its implementation. It was felt that one of the best forms of insurance would be to select carefully reputed and experienced contractors, adopt proven technologies and equipment, and ensure that contracts contained appropriate guarantee clauses. The Meeting suggested, however, that UNIDO should examine the practical aspects of such a scheme, which could be considered further.

39. There was general agreement that the work done by UNIDO on model contracts would be of interest to many countries, particularly those in the early stages of development. However, because of the variety of local circumstances, legal systems, and economic and managerial capabilities, no single model would be universally applicable. Nevertheless, the Meeting suggested that UNIDO should continue its investigations into alternative forms of contracts and should suggest guidelines for the developing countries' use. A variety of contracts, including turn-key and semi-turn-key contracts, and contracts for engineering services only, process know-how and some capital equipment could be considered at the same time.

The Consultation Meeting found that a number of topics required further examination and, if necessary, the establishment of Working Groups for the purpose. Topic 1 is described in paragraph 64 of the Report as follows:-

"Contract procedures intended to ensure the successful construction and operation of fertiliser plants and the suggested multilateral insurance scheme intended to ensure the protection of the interests of all parties concerned by providing, in particular, adequate compensation for consequential losses."

This paper has been prepared for the Working Group on this topic which will be convened by UNIDO early in 1978.

The subject will be first considered at a Technical Seminar on Contracting Methods and Insurance Schemes for Fertiliser and Chemical Plants convened by UNIDO and the Pakistan Government in Lahore from 25 - 29 November 1977.

This paper is one of the background papers which the Working Group and Technical Seminar will be invited to consider. It describes current contract practices and analyses how they protect the interests of buyers and sellers of fertiliser plants. It briefly considers whether they provide adequate compensation for consequential losses and poses some of the problems that will have to be overcome if such losses are to be covered by a multilateral insurance scheme.

I. CONTRACTS FOR THE CONSTRUCTION AND OPERATION OF FERTILIZER PLANTS

Introduction

1. This paper considers ways in which problems in the construction and operation of fertilizer plants can be avoided in the future.
2. The first part of the paper considers current contract procedures for the construction and commissioning of plants.

Model Contract for the construction of fertilizer plants

3. The contract for construction of a plant can be drawn up in any style acceptable to both the Purchaser and Contractor. But certain important provisions must be included to protect both parties. Various organisations in various countries have produced Handbooks of guidance to enable the two participants to the contract to avoid overlooking features which are relevant to the contract in question.
4. Of the various model contracts in existence which serve to guide the parties in drawing up a satisfactory contract, most concern themselves with the construction of buildings, bridges and other civil engineering works. Representatives of engineering companies and institutions from many countries have expressed the view that the two models drafted by the Institution of Chemical Engineers, London are an excellent basis to use for fertilizer plant contracts, partly because they are specifically concerned with process plants. ^{1/}
5. The Institute comments on the types of contract currently used as follows:-

"There is a wide range of types of contract covering varying degrees of cost and responsibility definition. The main types in common use, so far as cost definition is concerned, are as follows:-

Cost plus a percentage fee	}	- reimbursable contracts
Cost plus a fixed fee		
Target (share over-run)		
Guaranteed maximum		

^{1/} "Model Form of Contract for Process Plants. Suitable for reimbursable contracts in the United Kingdom" Revised edition 1976. The Institution of Chemical Engineers, 15 Belgrave Square, London. "Model Form of Contract for Process Plants. Suitable for Lumpsum contracts in the United Kingdom" 1968. Reprinted 1975 (A revised version of this Model Form is being prepared by the Institute.)

Lump sum (i.e. wholly lump sum)

Only the first of these is wholly reimbursable but all except the last involve, to some extent at least, reimbursement to the Contractor of the costs he actually incurs.

In any partly reimbursable contract, the provision of some goods and/or services is covered by a lump sum payment while others are paid for on a reimbursable basis."

6. These two examples of model forms of conditions of contract are very comprehensive indeed in their coverage of detail and the reader is referred to them for this. They are designed for use in the United Kingdom but would be relatively easily modified for use in other countries by making the following additions and changes:

- (i) modifications relating to sending equipment from one country to another;
- (ii) taking into account labour conditions relating to both local and expatriate manpower;
- (iii) modifications to the clauses relating to the governing law and to arbitration etc.

Sequence of events leading to the signing of the Contract

7. There are two major stages and both are of critical importance in defining fully and clearly the work to be done under the Contract and the responsibilities of the two main parties. They are described below in paragraphs 8-13; if these two stages are done well there will be a minimisation of the uncertainties, friction etc., which can otherwise damage the goodwill between Contractor and Purchaser and which will interfere with the co-operation between them which is essential if the project is to proceed successfully.

Preparation of the Invitation to Bid

8. The first steps in the sequence is the preparation of the Invitation to Bid document (this is sometimes called the 'Invitation to Tender'). It sets out the invitation under a number of headings, for example as follows:

General Information This section describes the intentions and requirements of the Purchaser. For example, the choice of type of Contract, the provision of on-site visits for the Tenderers, the information required regarding the Tenderer's personnel, the language to be used in all communications and so on.

Instructions to Tenderers This section sets out the form in which the tender must be prepared and how the tender documents must be presented. The procedure for opening and acceptance of tenders is described; this is particularly important if two-stage tendering is to be used. The manner of breaking-down the individual parts of the tender is described and the procedure for the pricing of each is given. Today there is usually a requirement for a Tender Bond to ensure that the chosen Tenderer does not withdraw on or after acceptance of his offer and this normally takes the form of a bank Letter of Guarantee in favour of the Purchaser for a proportion of the total value of the Tender (2% is common). This Tender Bond is usually of the pay-on-demand type but can be the subject of arbitration if the Tenderer feels aggrieved.

Technical Specifications This section describes the type of plant required, its capacity, the specifications of the products, the infrastructural requirements, the nature of the raw materials, safety provisions during the construction, the provision of spare parts, the nature of the guarantee required on raw materials efficiencies, climate conditions, the site, the availability of utilities and the general design requirements etc.

General Conditions This Section includes the requirements in respect of inspection and delivery of equipment, supervision of erection, acceptance trials, penalties for delays, failure to meet guarantees and specifications, force majeure, arbitration etc.

Examination of the Tenders

9. The second main stage in the sequence is the examination of the tenders and the process of harmonization to ensure that the tenders are being assessed on a comparable basis. In the more complex case of the two-stage tender, the first envelope contains the Technical Tender and the second contains the Priced Tender. At the first opening only the first envelopes are opened, thereafter the Technical Tenders are evaluated by the Purchaser. The evaluation is to ensure that the Technical Tenders comply with all the requirements of the Invitation to Bid in regard to aspects such as completeness of equipment and services to be provided, experience of the Contractor in similar projects and situations, construction organization, proven nature of processes, financial provisions etc.

10. During the evaluation the Purchaser calls for additions or deletions, and clarification to harmonize all the tenders. At this point each Tenderer is invited to prepare a Supplementary Priced Tender relating only to the agreed technical changes. The Tender Bond is modified accordingly.

11. At the second (public) opening the Priced Tenders and the corresponding Supplementary Tenders are opened. The Purchaser need not accept the lowest priced tender; the choice must be based on a consideration of all the relevant factors, the main objective being the overall success of the project. The chosen Contractor is given written notice of his appointment.

Consultancy Contracts to advise the Purchaser

12. The First Consultation Meeting on the Fertilizer Industry felt that one of the best forms of insurance would be to select carefully reputed and experienced contractors, adopt proven technologies and equipment, and ensure that contracts contained appropriate guarantee clauses. (Paragraph 38 of the Report).

13. Most companies and organizations which have not built fertilizer plants before, and many that have, employ Consultants with wide recent experience in the field. The Consultant's duties usually include advising the Purchaser on developing design requirements in order to obtain relevant and comparable tenders from reputable and competent Contractors; preparing the Invitations to Bid; evaluating the tenders received; assisting in the supervision of the design, engineering, equipment procurement, construction, testing, commissioning and the acceptance trials of the new plants. The engaging of good Consultants and the proper use of their staff can result in the avoidance of most of the problems which can otherwise beset a new venture.^{1/}

^{1/} A typical contract of a consulting firm with a purchaser as his technical adviser is available from UNIDO on request.

11. PROTECTION OF THE INTERESTS OF BUYER AND SUPPLIER

14. The Model Form of Contract drawn up by the Institution of Chemical Engineers can provide a check list suitable for ensuring that a contract protects the interests of buyer and supplier. The General Conditions of Contract are suitable for use without amendment; it cannot be emphasized too much that modifications to a model contract for a particular project should not be made without taking the advice of legal and engineering-contract specialists.

Guarantees relating to performance of the plant

15. Typical contracts for fertilizer plants require the contractors to give guarantees in a number of cases. These are entirely negotiable between the Purchaser and Contractor and therefore they vary from contract to contract. It is clear that if the guarantees (and the attached penalties) are too slack then the interests of the Purchaser will not be safeguarded; on the other hand, if they are too onerous contractors are likely to refuse to tender. A realistic path has to be taken between the two extremes.

16. The guarantees appropriate for different kinds of fertilizer plants differ of course according to the product to be manufactured, the process to be used, the raw materials quality and cost, the location of the plant and so on. As an example, typical guarantees required for a dihydrate phosphoric acid plant are indicated below; they are linked to the use of the phosphate rock designated by the Purchaser.

Capacity: This is usually 330 times the daily rated capacity.

Product Quality: This includes nutrient content, quantity of suspended solids, dissolved impurities etc; all as specified in the Contract.

Efficiencies: These relate to usage of raw materials such as sulphur and phosphate rock and of utilities such as electric power, steam, fuel oil and water.

Replacements: Any equipment found faulty during the first twelve months of the plant's life (usually running from the date of mechanical acceptance) must be replaced at the Contractor's expense.

A retention of the contract price, usually 5-10%, is with-held in case of non-realisation of any of the guarantees.

17. The methods of determining the achievement of the guaranteed specifications are set out in detail in the Contract. Those related to capacity, quality and efficiencies are based on an acceptance trial run of the plant which usually is for 48 - 168 consecutive hours operation. The Contract sometimes requires the acceptance trial to be delayed until immediately after the plant has run for at least 28 days at a high proportion of rated capacity. It has not been unknown for a purchaser to delay the acceptance trials, e.g. for commercial reasons such as lack of customers. Some Contracts therefore contain a clause which stipulates that the acceptance trials shall be deemed to have been successfully carried out if the purchaser delays the trials for more than a given period after mechanical completion.

Penalties to which Supplier may be liable

18. The General Conditions of the Contract list the penalties which are to come into force if any of the conditions are not met. They include the following:

Delays

19. Penalties apply against the Contract if there are delays to the specified dates for (i) delivering the documentation called for in the Contract, (ii) completion of erection, (iii) take-over by the Purchaser, (iv) the performance trials. There are also sometimes penalties for any delay in deliveries of key items of equipment. A typical penalty for delay of equipment is $1/2 - 1\%$ of the f.o.b. value of the delayed equipment per week of delay. The total penalty applicable is usually limited to 5% of the value of the item but, if the delayed item hinders the proper operation of a section of equipment then the penalty is calculated on the f.o.b. value of the whole section.

20. The penalty for the other delays mentioned usually requires the payment of liquidated damages at the rate of 0.25% (typically) of the total value of the Contract for each week of delay. A maximum penalty, typically 10% of the Contract value is normally in force.^{1/} Sometimes the Contract provides for a bonus for completion before the agreed date, this is typically at 50% of 100% of the rate of the penalty for the same period of delay.

^{1/} The Model Form of Contract for Reimbursable Contracts suggested for use in the United Kingdom discusses this matter in Section F of the Guide Notes on Special Conditions. Penalties relating to plant performance are discussed in Section K. The combined impact of both types of penalty are considered in the penultimate paragraph of Section K.

Capacity, Quality and Efficiencies

21. All these are guaranteed in the Contract and are determined by the performance tests carried out as described therein. The results of the performance tests are compiled and evaluated jointly by the Purchaser and the Contractor and the output, raw materials usages etc. are averaged over the period of the relevant test. If the plant fails to meet any of the performance conditions, even after time for modifications has been allowed, the Contractor is required to pay liquidated damages to the Purchaser in accordance with the terms of the relevant section of the Contract. In the case of the phosphoric acid plant taken as an example, large penalties are usually involved for each percent excess in the usage of phosphate rock and sulphur. Smaller penalties apply to each percent excess in the usage of electric power, sweet water, steam etc.

22. Penalties in respect of capacity and quality are applied in a similar manner to those just described for the efficiency of usage of both raw materials and utilities.

Tender and Performance Guarantee Bonds

23. It is common practice to require Tenderers to submit, together with their priced tenders, a Bank or Surety Company Letter of Guarantee in favour of the Purchaser for a sum equal to 2% of the total value of the tender, as a Tender Bond. This is to ensure that in the event of the acceptance of the tender the Tenderer will proceed to sign the Contract and to provide the Performance Bond mentioned later. A typical form of Bond used in Middle East Contracts is included as Annex A. A typical Tender Bond (Bid Bond) is appended as Annex B; it relates to U.S. Government Contracts. Tender Bonds are frequently "on-demand bonds" without any legal proceedings or proof of damage and without prejudice of the right of the Purchaser to recover any direct damage exceeding the amount of the Tender Bond which the Purchaser may suffer as a result of the default. The Tender Bonds from unsuccessful Tenderers are returned (sometimes late or not at all) and so is that to the successful Tenderer as soon as he has submitted the appropriate Performance Bond.

24. A Performance Bond for the construction of a fertilizer plant (sometimes called a Construction Contract Bond) is one whereby the Contractor and the Bank or Surety Company undertake that the Contractor will perform his obligations under the Contract. The object of the Performance Bond is therefore to indemnify the Purchaser against loss resulting from the failure of the Contractor to complete the work in accordance with the plans and specifications and (in some countries) to guarantee payment of all bills incurred by the Contractor for labour and materials for the work. A typical form of Performance Bond issued by a Surety Company is given as Annex C; it is written to cover a certain percentage of the value of the Contract, usually with a minimum of 10% and a maximum of 100%.

25. Large Contracts usually provide that the Contractor will establish a Performance Guarantee Bond, confirmed by a Bank or a Surety Company, in favour of the Purchaser for an agreed percentage of the value of the Contract. At the present time the percentage quoted in the Bond is tending to rise with 10% normal and 25% not unknown (100% is the minimum for Government Contracts in U.S.A. and up to 100% can be obtained from U.S. Surety Companies for some overseas contracts). Generally speaking it is usually easier for a Contractor to obtain a Bond from his own bank rather than from a Surety Company, presumably because the bank has a detailed knowledge of its customer's affairs.

26. It should be noted that the Contractor is responsible for all penalties and demands on him according to the Contract and that the Performance Bond normally only becomes a liability to the Bank or Surety Company if the Contractor is unable to pay, for example because bankrupt or is in danger of being so. It should also be noted that Surety Companies are usually held to be jointly and severally liable with the Contractor, which gives the Purchaser the choice of which to approach first. But Bank Guarantee Bonds are normally written by the Bank only, and can therefore be called without reference to the Contractor.

27. One of the main virtues of Tender Bonds and Performance Bonds is that they weed out Contractors who, in the eyes of the Banks or Surety Companies are not a good risk for having the capacity to fulfil the Contract. Moreover, Surety Companies will only issue a Tender Bond to a Contractor if they will be willing, at a later stage, to issue the corresponding Performance Bond.

28. It is necessary to draw a distinction between the attitudes of Surety Companies and Banks to the provision of Bonds. The former will, for all practical purposes, never provide on-demand bonds, whereas Banks in practice never give anything else.^{1/} Also, Banks prefer to restrict their obligations to the payment of money, whilst Surety Companies sometimes agree to take over the Contractor's obligations under the Contract. The financial guarantee in a Performance Bond given by a Bank is normally limited to a relatively small percentage of the contract price, commonly 5-10%. The Bond from a Surety Company, which can be for up to 100% of the contract price, is not a financial guarantee as such and is not on-demand, but it provides an undertaking to the Purchaser that a plant of the required specification will in fact be built.

29. Certain countries, particularly in the Middle East and in Eastern Europe will generally accept On-Demand Bank Guarantees only, so that the Contractor does not always have the choice. An On-Demand Bond irrevocably and unconditionally guarantees the Contractor up to a certain percentage of the total contract price for the due execution and proper performance of the Contract. It undertakes to pay the Purchaser on the first demand in writing to the Bank, any amount claimed up to the sum equating to the percentage mentioned in the Bond, notwithstanding any contestation of the Contract or any other party.^{2/}

30. Contracts for some fertilizer plants are now becoming so large in money terms that there is a danger that the existing private industry will be unwilling to issue the necessary Bonds simply because their size might jeopardise the whole existence of the company. The situation is arriving at the stage where some Surety Companies take the view that Government to Government bonding is likely to become the only way for the biggest Contracts. This matter is discussed further in paragraphs 54-59 of this paper.

^{1/} Banks and Surety Companies in the United States refuse to provide pay-on-demand bonds, insisting instead that any dispute relating to the bond shall be a subject for arbitration.

^{2/} For fuller details of Surety Company Bonds see "Surety Underwriting Manual", author Luther E. MacKall, publisher Rough Notes Co., Inc., Indianapolis. Especially Chapter V, pages 98-123 relating to Construction Contract Bonds.

Arbitration

31. All Contracts of any magnitude for chemical plant include an arbitration clause and some have provision for the bringing in of an "Expert". If there is provision in the Contract for the appointment of an Expert, the objective is to try to minimise the cost and the delay of sending a dispute to arbitration. The Expert is required to decide all disputes referred to him as an expert and not as an arbitrator. The Purchaser and the Contractor give the Expert every assistance in deciding any dispute referred to him and they undertake to be bound by his decision without question. Any dispute which is referred to an Expert shall immediately cease to be referable to arbitration under the relevant section of the Contract.

32. Subject to the previous paragraph, any dispute which may arise between the Purchaser and the Contractor out of or in connection with the Contract shall be referred to arbitration in accordance with the provisions of the Contract. The Contract may call for the arbitration to be administered by any Court of Arbitration in the world. There are several of the latter, but it is important that the country specified for arbitration has signed the 1958 New York Convention on the Reciprocity of Enforcement of Arbitration Awards; this has been signed by 80 countries. There are some countries, for example Iraq, where only local arbitration is legally enforceable.

33. Two of the best known Courts of Arbitration are (i) that set up in Paris by The International Chamber of Commerce, and (ii) the Court of Arbitration set up in 1883 by the Corporation of London; the latter specialises in technical arbitration. There is a tendency for arbitration to take too long to come to Court; twelve weeks has been included as the maximum period before commencing the work of arbitration at the London Court, in one recent large process plant Contract. So far as delays are concerned, a distinction requires to be made between willing reference by the parties to arbitration and cases where a party deliberately sets out to procrastinate. In the former case delays are minimal, in the latter case delays can be very long (unless provision is made in the Contract) and both Courts and Arbitrators find this situation difficult to cope with.

34. At the Ninth Meeting of the United Nations Commission on International Trade Law, UNCITRAL, a recommended set of arbitration rules was adopted. These require that the parties to a Contract (or a dispute):

- (i) name the authority which (a) appoints the Arbitrators and (b) is responsible for administering the arbitration;
- (ii) decide on whether one or three Arbitrators shall be used;
- (iii) name the place of arbitration;
- (iv) state the Law applicable to the arbitration;
- (v) state the language to be used.

35. The arbitration award is normally final and subject to no appeal; but there may be a difference of situation in some cases depending on the law applicable. In addition the award deals with the question of the costs of arbitration and all matters resulting therefrom.

Insurance during plant construction

36. Almost all Contracts for fertilizer plants have clauses requiring the Contractor to take out insurance policies of an 'appropriate kind'. But the details are often not spelled out, it being left to the Contractor to recommend exactly what should be done and to agree it with the Purchaser. The latter, and all sub-contractors, are joined in the policy with the Contractor himself. A review of present practice in regard to insurance during plant construction is in the Model Form of Contract for Process Plants: suitable for reimbursable contracts in the United Kingdom (pages 22-23).

37. The insurance normally covers the following:

- (i) the replacement value of the plant and materials against loss or damage up to the time of take-over by the Purchaser and also during the defects-liability period;
- (ii) loss of damage to property of the Purchaser and all third parties;
- (iii) liability in respect of death or personal injury to any person, arising out of or in connection with the performance or the Contract;
- (iv) transport of equipment and other materials to the construction site.

38. The Contract requires the Contractor to give certified copies of the insurance policies covering the above, and any other aspects agreed between the two parties, to the Purchaser.

39. The Contract often requires that the insurance shall be placed with an Insurance Company located in the country in which the plant is to be built, sometimes this is a requirement of the law of the country concerned.

40. In insurance matters the Contractor is required to act, not only on his own behalf, but also as an agent of the Purchaser and all sub-contractors. This includes any claims made under the policies, but he is not free to give any release or compromise any claim without the prior approval in writing of the Purchaser and sub-contractor concerned. It is usual to limit the liability of the Contractor for loss of, or damage to, the property of the Purchaser, other than the plant and materials which are the subject of the Contract. A typical maximum liability is \$5 million or such other sum as may be agreed between the two parties in respect of any one incident.

41. The Contractor's usual procedure is to take out an All-Risks Policy covering damage to the plant during the construction and defects-liability period. The sum paid by the Insurance Company normally covers only the costs of the repair and does not cover the consequential losses arising from the delay to the commissioning of the plant. Some Companies, however, are prepared to cover the consequential loss on payment of the additional premium provided that the delay to commissioning arises from a defined insurable accident.

42. The Performance Bond, mentioned above, gives a further safeguard to the Purchaser in regard to the due execution and proper performance of the Contract; it is valid from the day of issue until the completion of the Contractor's obligations and guarantees under the Contract.

43. Another form of insurance which must be mentioned in this Section is credit insurance, usually used for export contracts. The demand for credit insurance has increased recently because of the world recession, unsettled trading conditions and the increase in the number of insolvencies. Not only is export credit insurance increasing in volume today but it is undergoing a number of changes. These are associated with the increasing size of export contracts (for example, the minimum viable scale of ammonia plants and phosphoric acid plants has been steadily going up) and the impact of heavy underwriting losses due to inflation. The larger risks involved have created an increased demand for various types of bonds, guarantees and indemnities at a time when inflation and the larger scale of operations has made the provision of bonds more difficult to arrange. Again, credit insurance is given to the Contractor only, and does not benefit the Purchaser, with whom we are primarily concerned in this paper.

44. Most Contracts have a clause designed to limit the liability of the Contractor and this is mainly concerned with responsibility for payments in respect of consequential loss and in respect of the use of designs etc. which have been specifically requested by the Purchaser.

Export Credit Insurance and Guarantees

45. Most industrialized countries have a government department which will guarantee exporting companies against various risks associated with contracting plants overseas. The main risks covered include (i) the insolvency of the Purchaser in the overseas country (ii) the Purchaser's failure to pay in accordance with the Contract (iii) government action preventing or delaying the transfer of payment in the currency stipulated in the Contract (iv) war, revolution or civil disturbance involving the Purchaser's country.

46. The government department concerned normally works with a set of rules which require (a) the Contractor to retain some interest in the transaction, normally therefore it covers only 90-95% of the losses arising from the risks listed; (b) it to provide its insurance at the lowest possible prices consistent with operating on a non-profitmaking, and sometimes subsidized, basis. The premium rates naturally vary in accordance with the nature, extent and duration of the expected risks in the market concerned. Most supplier companies and Contractors include the cost of the premium in their quotation.

47. These government export credit guarantee departments have given a great deal of security (and the ability to obtain finance) to exporters, and have been in existence for very many years. The British department was set up in 1919.

48. The Export Credit Schemes of all countries (as opposed to the Aid Funds) have regard to the national interest of their own country, in that the protection they give is to the exporter. The developing countries appreciate this and are asking for arrangements to protect the buyer, an aspect with which this paper is particularly concerned.

III. THE EXTENT TO WHICH CONSEQUENTIAL LOSSES ARE COVERED

The contractual liability of the supplier

49. A well-drawn-up Contract, together with a Performance Bond for at least 10% of the value of the Contract, will protect the Purchaser against almost all eventualities but one during the construction of the plant and the defects-liability period, usually 12 months. The exception is the financial loss arising from loss of production and which is the subject of Contractor's liability limitation as described in paragraph 44 above. Even this is the subject of some protection because the penalty clauses covering lateness and failure of the plant to reach its rated capacity will provide liquidated damages to compensate the Purchaser, to some extent, for the loss of production for a period.

50. The administrative difficulties associated with insuring against consequential loss are serious and they mainly arise from the problems of (i) quantifying loss and (ii) establishing cause and responsibility.

51. The first problem, quantifying the loss, is the less serious and it is usually possible for the Contractor and Purchaser to come to some agreement concerning the magnitude of the loss in a particular case. For example if a plant does not produce, the Purchaser is often forced to make good the production loss by purchases on the open market. He must have these goods for retaining his customers and/or for use as feedstocks for his downstream plants. The value of the consequential loss can therefore be quantified (putting it simply) as the cost of the bought-in products minus the savings of raw materials, utilities etc. arising from not running the damaged plant. Even if the magnitude of the loss can be identified in this way, the insurance company concerned still has the problem of trying to quantify the risk, before the event, in order to arrive at a fair rate of premium. The insurers cannot judge how long the plant is likely to be out of action nor if the daily loss of output will be 100% or a lower figure. The problem of estimating the risk is one reason deterring insurers from providing this kind of cover.

52. The second main problem, establishing the cause and responsibility for the loss, is difficult because the cause is seldom clear-cut and there is frequently a divided responsibility. For example corrosion of a key item of plant, which often takes a year or two to show up, may be due to faulty design or second-grade materials of construction installed by the Contractor or due to inexperienced or sub-standard plant operation over a

long period by the Purchaser. Each party knows where to place the blame! Arbitration will normally be required. Even though the Contractor does his best to limit his liability there are occasional instances of incompetence and negligence and in many of these cases the insurers and/or the Contractor have compensated the Purchaser in whole or in part. It seldom pays an insurance company or a Surety Company to see a customer go out of business and a loan of some kind can usually be arranged.

53. In certain cases insurers will provide some degree of cover against consequential loss up to a fixed amount. This is when it arises as a consequence of an insurable accident such as fire or earthquake. Similarly it is possible to obtain consequential loss insurance up to a fixed amount when the loss is due to the failure of a specific item of equipment (e.g. a compressor) when there is adequate experience of the likelihood of breakdown of the item concerned.

The prospects for providing consequential loss insurance

54. We find that all commercial insurance and Surety Companies have given considerable thought to this matter and would like to find a way to provide it. The difficulties are recognized, however, and the central problem in their view is how to judge the risk in individual cases.

55. There will be a problem in establishing the cause and responsibility for the occurrence leading to consequential loss. One of the difficulties lies in isolating the risks which are presently insurable from those which are not. The recent experience of commercial insurance companies in the field of insuring jumbo projects is that it is essential, in order to gain acceptance in the market, that the new forms of cover shall be a logical development of those already in existence, and that the traditional principles of insurance shall continue to apply. In general, therefore, it is possible today to insure a Contractor against his liability for damage, material or otherwise, which he causes to the Purchaser. The perils insured against should be, as far as possible, accidental or unforeseeable, such as fire or earthquake.

56. But it is not possible to insure the Purchaser against the losses he suffers due to his own inabilities. Commercial insurance companies at present take the reasonable view that losses suffered by the Purchaser as

a result of his own incompetence in operating the plant, or of the largely foreseeable and inevitable failure of and inadequacies of local infrastructure, such as power supplies and feedstocks, must be fundamentally uninsurable in accordance with normal insurance practice.

57. Paragraphs 44-45 of the Report of the First Consultation Meeting describe the four major reasons for the low operational efficiencies and capacity utilization in fertilizer plants set up in developing countries. Of these four reasons faulty plant design can be regarded as an insurable proposition but, according to present insurance practice, not those problems arising from inadequate infrastructure, faulty maintenance or market constraints.

58. The louder demands for consequential loss insurance arise at a time when projects are increasing in size, inflation is increasing; the amounts of cover requiring to be found, Performance Bonds percentages are steadily rising and the increasing proportion of fertilizer plants being built in developing countries increases the variety of risks being faced by the older-established Underwriters.

59. When considering the Purchaser's need for consequential loss insurance it is important to differentiate between consequential losses arising from problems during construction and those arising from problems occurring after the end of the contract. Clearly, during construction, commissioning and maintenance the Purchaser has a better chance of recovering from the Contractor. Once the contractual obligations are complete however, the Purchaser is forced to rely on common law liability and the simple elapsing of time will make it more difficult for him to pin responsibility on to the Contractor. And yet the greatest need for consequential loss insurance arises at this time.

The need for a multilateral insurance scheme to cover consequential losses

60. So what can be done? Some commercial Insurance and Surety Company Managers feel that both consequential loss insurance and even the conventional bonding and insuring of jumbo-sized projects is beginning to outstrip the capacity of commercial companies. Others believe that the commercial companies in co-operation with the commercial banks can handle the traffic - perhaps with one or more Governments providing reinsurance facilities for the high risks.

61. In some countries the export credit guarantee departments are now willing to provide a counter-indemnity to banks which provide a bond in excess of their customer's normal credit limits of bonding. It does not follow that, even with Government support, a Contractor is always wise to bid for the largest contracts having regard to his obligations in terms of penalties. Large contracts can involve major losses, including penalties, and insurance protection can be difficult to obtain.

62. A number of schemes are possible and two of the more promising ones are the following:-

- (i) a multilateral agency involving Governments which some authorities suggest should operate on World Bank lines. This agency would receive requests for insurance cover or bonding of projects which are outside the present scope of the commercial companies; consequential loss insurance in particular. The agency would lay down the format in which the request must come forward and would have a staff of technical and insurance specialists experienced in assessing the risks. The insurance would be offered at a fair rate, and if desirable, part or all would be re-insured with commercial Underwriters. Compensation would be paid when liability is established to the satisfaction of the agency or by the process of arbitration.
- (ii) A second possibility is a multilateral agency staffed by personnel who are experienced in the fertilizer industry and by those experienced in risk analysis. An agency run on these lines would advise commercial concerns who now would effect the insurance with a sound knowledge of the risks involved.

63. The first possibility is regarded favourably by those (the majority) who believe that projects are now becoming so large, and risks so varied that co-operation between Governments and commercial organizations is becoming essential. As mentioned in para. 30 Government to Government bonding may develop and even Government to Government contracting for the largest projects. The first possibility is also favoured by those who believe that insurance in the conventional, commercial sense will not really provide the consequential loss cover we seek. Not even Governments will offer reinsurance against certain loss, although they may well offer aid.

64. Those in favour of the second possibility are the pundits who believe that the first possibility would take far too long to bring into being. They also point out that the wide diversity of industry would need a large organization; indeed, it has been suggested that it should be a major aim of the World Bank.

65. This report is not an end in itself, its main function is to set out an important part of the background against which the Working Group must work. The Group has the responsibility, through the UNIDO Secretariat, of making firm recommendations to the Second Consultation Meeting on the Fertilizer Industry. These recommendations must be related to the **concerns expressed at the First Consultation Meeting**. It is expected that the recommendation involving a proposal for establishing a multilateral insurance scheme against consequential losses will give rise to the largest problems.

66. During the course of preparing this report personal discussions have taken place in six countries with three professional organizations representing engineers, three consultancy companies concerned with fertilizer plants and the provision of infrastructure, three contractors experienced in building fertilizer plants, two organizations concerned with arbitration, four Insurance and Surety companies, representatives of two banks as well as UNIDO personnel and Purchasers from developing countries. It is the majority opinion that the first of the two schemes advanced for providing the consequential loss insurance has most promise and could be based on aid, at least in the first instance.

67. Such a scheme must on no account be regarded as a substitute for a good contract, operator and management training, proper infrastructural development, a good spirit of co-operation between the parties and all the other essentials mentioned in this report. Above all, any consequential loss insurance scheme must not be operated in such a way as to permit any weakening of the sense of responsibility of either the Contractor or the Purchaser which is crucial for the success of any project. Too soft an insurance cushion will not be in the best interests of either party; there is normally no merit in any procedure which dilutes the will to achieve the primary objective - which must be to get the plant working well at the earliest possible time.

IV. MORE DIRECT WAYS TO MINIMISE CONSEQUENTIAL LOSSES

68. As pointed out above, many of the difficulties encountered can be eliminated or minimized by the Purchaser choosing a good Contractor, adopting a good Contract and, if necessary, engaging a good Consultant. Building a large fertilizer plant is a very specialized business and so is the carrying out of the feasibility studies, the preparation of the Invitation to Bid, the choice of Contractor, the monitoring of the construction and of the commissioning, all of which are often included in the work of the Consultant. There is no doubt that, unless the Purchaser has staff who are competent and free to do the work, the use of good independent Consultants will be a better investment than failing to use Consultants and investing the money in insurance.

69. A good Contract, based for example on the models quoted above and incorporating adequate penalties, but not so severe as to deter the better Contractors from tendering, will give satisfactory cover during the construction or defects-liability period; particularly when combined with a Performance Bond for at least 10% of the Contract value. It must also be recognized that the ease of obtaining bonding, and its cost which ultimately falls on the Purchaser, depends on the Bank or Surety Company's view of the Contract and the consultancy safeguards.

70. The magnitude of some of the higher forecasts of the numbers of large fertilizer plants to be built in the next twenty years or so raises the question as to whether or not the world capacity of plant contractors will be adequate to fulfil the requirement. It is possible that the fertilizer plant contracting business will become a sellers' market and hence make it more difficult for purchasers to impose for their own protection some of the desirable contract conditions, for example relating to bonds and penalties.

71. For companies without wide experience of fertilizer manufacture it is desirable to include in the Contract, or in allied arrangements, provision for all or some of the following:-

- (i) training courses, both basic and in operation and maintenance of a plant similar to the one being constructed;

- (ii) A management contract to run the plant for a limited number of years after start-up. Several good firms with long experience of fertilizer manufacture offer these contracts. The contract arrangements are quite flexible and can be tailored to suit individual cases. They can be linked to training courses and arranged to run down as local personnel become increasingly equipped to take over;
- (iii) a maintenance contract to service the more important items of equipment; this also can be linked to on-the-job training.

72. Provision of contracts for all or some of the above protects the interests of the Purchaser because they ensure, as far as is possible, that the plant will be well-run and well-maintained in the early years of its life and therefore output, quality and materials efficiencies will be satisfactory. Similarly the interests of the Contractor are protected because the plant is less likely to be damaged by inexperienced staff.

73. Experience has shown that management and maintenance contracts are best not awarded to the plant licensor or builder if the covering-up of faults is to be completely avoided. It is best even to avoid arranging these contracts with firms from the same country as the licensor or builder.

74. Many projects involve much more than the straightforward construction of a fertilizer plant. For example, plants to produce phosphoric acid and phosphate fertilizer intermediates are frequently linked with up-stream mining and beneficiation operations for phosphate rock, the provision of utilities, docks, roads etc. and with downstream arrangements for effluent disposal and for sales and distribution. Contractors for building fertilizer plants are often not experienced to help the Purchaser in some of these matters and experienced impartial help is required. Consultants specializing in every aspect of the overall project are available to give help which is quite independent of licensors, contractors, marketing companies, etc.

75. As has been indicated before, a well-presented, well-managed project based on good and detailed contract arrangements, with full ancillary contracts for training, management etc. will have the best chance of receiving loan finance and obtaining bonding at the lowest cost in addition to having the best chance of providing a trouble-free plant.

FORM OF LETTER OF GUARANTEE FOR TENDER BOND

To: The General Organisation for

Dear Sirs,

With reference to the Tender of Messrs.....
in connection with the adjudication of tenders for a plant for
the production of phosphoric acid, etc. at
we hereby undertake to hold at your disposal, as a Tender Bond,
free of interest and payable in cash on your first demand, and
notwithstanding any contestation by the Tenderer or any third
party, the sum of

.....

This Letter of Guarantee is valid until the Tender is
finally decided upon, and, in the event of all or part of the
Tender being accepted, until such time as the Tenderer shall
provide a pecuniary guarantee for the proper performance as may
be required by you, but it will, in any case, expire on the
.....

Should we receive no claim from you by that date, our
liability will cease 'ipso facto' and the present letter of
guarantee will definitely become null and void.

Please return to us this letter of guarantee on expiry date,
for cancellation.

Signed

(BANK)

STANDARD FORM 24 JUNE 1964 EDITION GENERAL SERVICES ADMINISTRATION FED. PROC. REG. (41 CFR) 1-16.801		BID BOND (See Instructions on reverse)		24-103	DATE BOND EXECUTED (Must not be later than bid opening date)	
PRINCIPAL (Legal name and business address)				TYPE OF ORGANIZATION ("X" one)		
				<input type="checkbox"/> INDIVIDUAL <input type="checkbox"/> PARTNERSHIP <input type="checkbox"/> JOINT VENTURE <input type="checkbox"/> CORPORATION		
SURETY(IES) (Name and business address)				STATE OF INCORPORATION		
PENAL SUM OF BOND				BID IDENTIFICATION		
PERCENT OF BID PRICE	AMOUNT NOT TO EXCEED				BID DATE	INVITATION NO
	MILLION(S)	THOUSAND(S)	HUNDRED(S)	CENTS		
<p>KNOW ALL MEN BY THESE PRESENTS, That we, the Principal and Surety (ies) hereto, are firmly bound to the United States of America (hereinafter called the Government) in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally: <i>Provided</i>, That, where the Sureties are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety, but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sum.</p> <p>THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the bid identified above.</p> <p>NOW, THEREFORE, if the Principal, upon acceptance by the Government of his bid identified above, within the period specified therein for acceptance (sixty (60) days if no period is specified), shall execute such further contractual documents, if any, and give such bond(s) as may be required by the terms of the bid as accepted within the time specified (ten (10) days if no period is specified) after receipt of the forms by him, or in the event of failure so to execute such further contractual documents and give such bonds, if the Principal shall pay the Government for any cost of procuring the work which exceeds the amount of his bid, then the above obligation shall be void and of no effect.</p> <p>Each Surety executing this instrument hereby agrees that its obligation shall not be impaired by any extension(s) of the time for acceptance of the bid that the Principal may grant to the Government, notice of which extension(s) to the Surety(ies) being hereby waived; provided that such waiver of notice shall apply only with respect to extensions aggregating not more than sixty (60) calendar days in addition to the period originally allowed for acceptance of the bid.</p> <p>IN WITNESS WHEREOF, the Principal and Surety(ies) have executed this bid bond and have affixed their seals on the date set forth above.</p>						
PRINCIPAL						
Signature(s)	1. _____		2. _____		Corporate Seal	
	(Seal)		(Seal)			
Name(s) & Title(s) (Typed)	1. _____		2. _____			
INDIVIDUAL SURETIES						
Signature(s)	1. _____		2. _____			
	(Seal)		(Seal)			
Name(s) (Typed)	1. _____		2. _____			
CORPORATE SURETY(IES)						
SURETY A	Name & Address			STATE OF INC	LIABILITY LIMIT	
	Signature(s)	1. _____		2. _____		Corporate Seal
	Name(s) & Title(s) (Typed)	1. _____		2. _____		

CORPORATE SURETY(IES) (Continued)					
SURETY B	Name & Address		STATE OF INC.	LIABILITY LIMIT	<i>Corporate Seal</i>
	Signature(s)	1.	2.		
	Name(s) & Title(s) (Typed)	1.	2.		
SURETY C	Name & Address		STATE OF INC.	LIABILITY LIMIT	<i>Corporate Seal</i>
	Signature(s)	1.	2.		
	Name(s) & Title(s) (Typed)	1.	2.		
SURETY D	Name & Address		STATE OF INC.	LIABILITY LIMIT	<i>Corporate Seal</i>
	Signature(s)	1.	2.		
	Name(s) & Title(s) (Typed)	1.	2.		
SURETY E	Name & Address		STATE OF INC.	LIABILITY LIMIT	<i>Corporate Seal</i>
	Signature(s)	1.	2.		
	Name(s) & Title(s) (Typed)	1.	2.		
SURETY F	Name & Address		STATE OF INC.	LIABILITY LIMIT	<i>Corporate Seal</i>
	Signature(s)	1.	2.		
	Name(s) & Title(s) (Typed)	1.	2.		
SURETY G	Name & Address		STATE OF INC.	LIABILITY LIMIT	<i>Corporate Seal</i>
	Signature(s)	1.	2.		
	Name(s) & Title(s) (Typed)	1.	2.		

INSTRUCTIONS

1. This form is authorized for use whenever a bid guaranty is required in connection with construction work or the furnishing of supplies or services. There shall be no deviation from this form without approval by the Administrator of General Services.

2. The full legal name and business address of the Principal shall be inserted in the space designated "Principal" on the face of this form. The bond shall be signed by an authorized person. Where such person is signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of his authority must be furnished.

3. The penal sum of the bond may be expressed as a percentage of the bid price if desired. In such cases, a maximum dollar limitation may be stipulated (e.g., 20% of the bid price but the amount not to exceed _____ dollars).

4. (a) Corporations executing the bond as sureties must be among those appearing on the Treasury Department's list of approved sureties and must be acting within

the limitations set forth therein. Where more than a single corporate surety is involved, their names and addresses (city and State) shall be inserted in the spaces (Surety A, Surety B, etc.) headed "CORPORATE SURETY(IES)", and in the space designated "SURETY(IES)" on the face of this form only the letter identification of the Sureties shall be inserted.

(b) Where individual sureties execute the bond, they shall be two or more responsible persons. A completed Affidavit of Individual Surety (Standard Form 28), for each individual surety, shall accompany the bond. Such sureties may be required to furnish additional substantiating information concerning their assets and financial capability as the Government may require.

5. Corporations executing the bond shall affix their corporate seals. Individuals shall execute the bond opposite the word "Seal"; and, if executed in Maine or New Hampshire, shall also affix an adhesive seal.

6. The name of each person signing this bid bond should be typed in the space provided.

SURETY COMPANY

BY THIS BOND, We, _____, whose
 registered office is at _____ in the
 County of _____ (hereinafter called "the Contractor") and
 SURETY COMPANY, of _____
 (hereinafter called "the Surety") are held and firmly bound
 unto

_____ (hereinafter called "the Employer")
 in the sum of _____

for the payment of which sum the Contractor and the Surety bind themselves
 their successors and assigns jointly and severally by these presents.

SEALED with our respective seals and dated this _____ day of
 197 _____

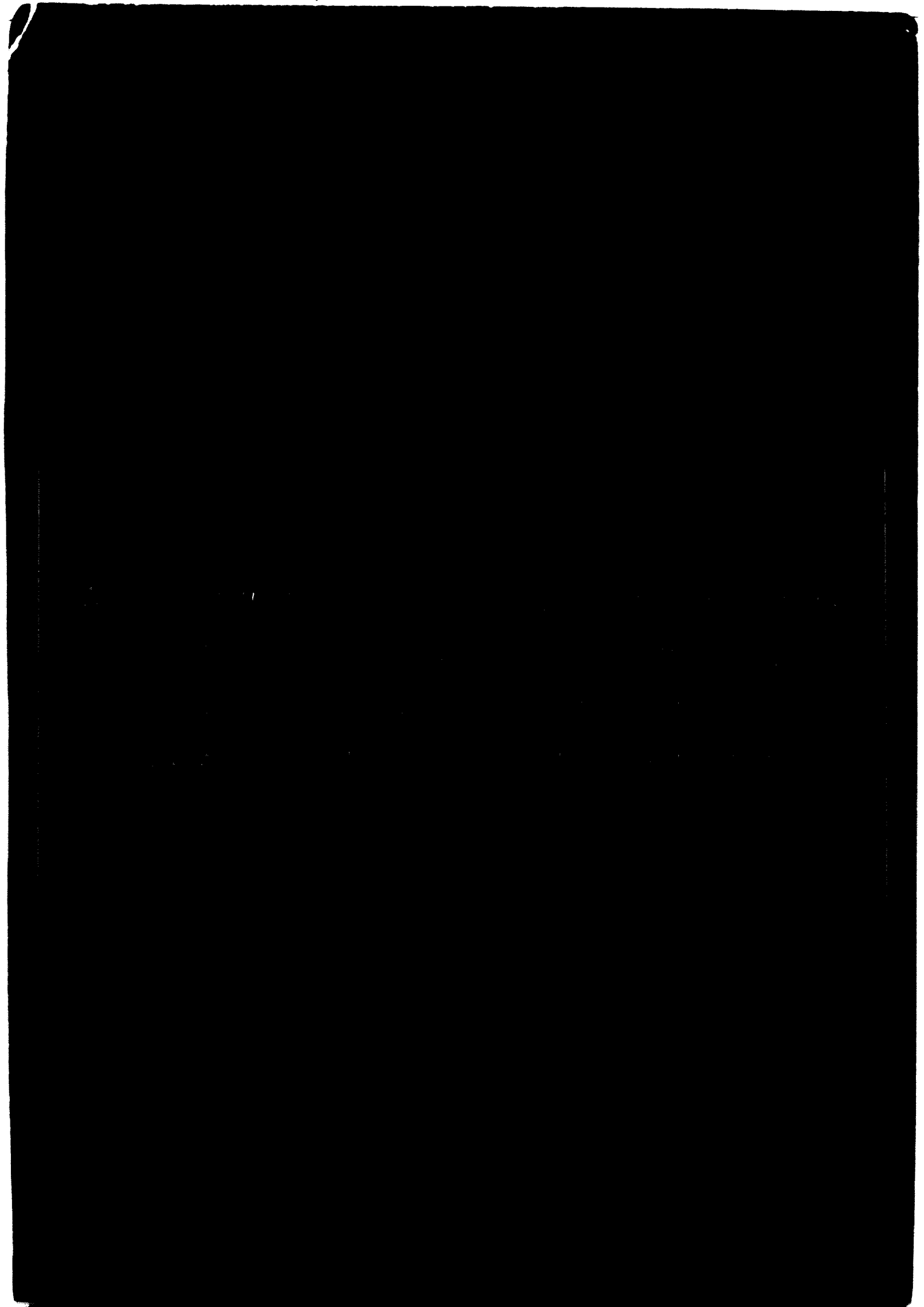
WHEREAS the Contractor by an Agreement made between the Employer of the
 one part and the Contractor of the other part has entered into a Contract
 (hereinafter called "the said Contract") for the construction and com-
 pletion of the Works and maintenance of the Permanent Works as therein
 mentioned in conformity with the provisions of the said Contract.

NOW THE CONDITION of the above-written Bond is such that if the Contractor
 shall duly perform and observe all the terms, provisions, conditions and
 stipulations of the said Contract on the Contractor's part to be performed
 and observed according to the true purport intent and meaning thereof or
 if on default by the Contractor the Surety shall satisfy and discharge
 the damages sustained by the Employer thereby up to the amount of the
 above-written Bond then this obligation shall be null and void but other-
 wise shall be and remain in full force and effect but no alteration in
 terms of the said Contract made by agreement between the Employer and the
 Contractor or in the extent or nature of the works to be constructed
 completed and maintained thereunder and no allowance of time by the
 Employer or the Engineer under the said Contract nor any forbearance or
 forgiveness in or in respect of any matter or thing concerning the said
 Contract on the part of the Employer or the said Engineer shall in any
 way release the Surety from any liability under the above-written Bond.

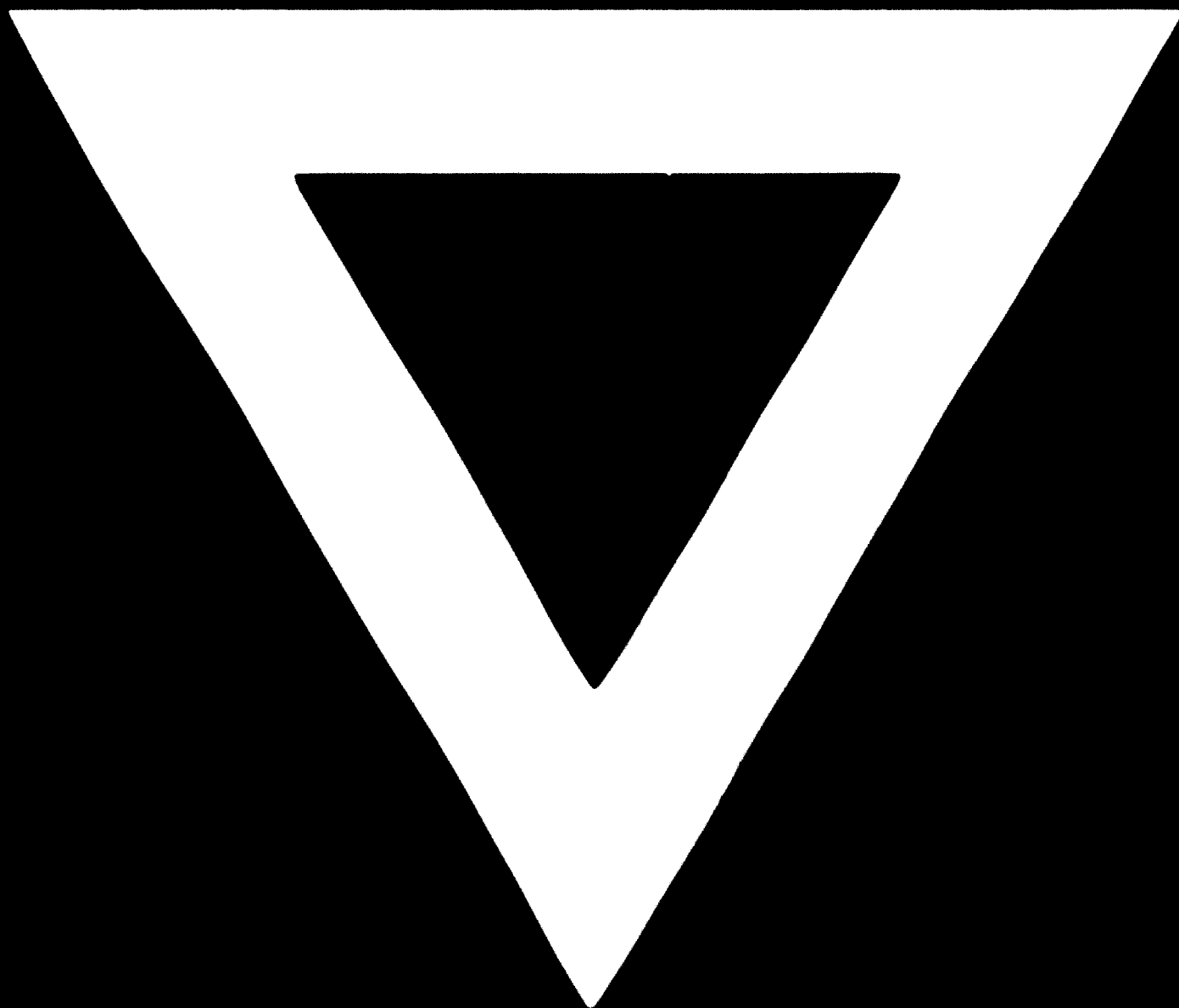
The Common Seal of _____
 was hereunto affixed
 in the presence of:

The Common Seal of
 SURETY COMPANY
 was hereunto affixed
 in the presence of:





B - 35



79.11.30