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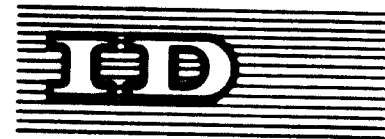
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Second Consultation Meeting on the
Fertilizer Industry
Innsbruck, Austria, 6-10 November 1978
Agenda item 3

THE PROGRESS MADE IN IMPLEMENTING THE FOLLOW-UP ACTION
RECOMMENDED BY THE FIRST CONSULTATION MEETING*

Issue Paper
by the UNIDO Secretariat

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16 October 1978

ENGLISH ONLY

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Corrigendum

Page 1, footnote 1

For ID/B/175 read ID/B/178

Page 27, paragraph 79, line 9

For Establishing the Financing read Establishing and Financing

Page 33, line 4

Delete (update X 81)

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I. FOLLOW-UP ACTION RECOMMENDED BY THE FIRST CONSULTATION MEETING

1. The First Consultation Meeting suggested to the Executive Director that the next Consultation Meeting should be held in 1978. It proposed the following subjects for more intensive examination and investigation:

"Contract procedures intended to ensure the successful construction and operation of fertilizer 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.

Ways and means to reduce the high cost of fertilizer plants and of mobilizing the large volume of funds required for investment.

Continuous monitoring of fertilizer production capacity at the national, regional and global level in order to facilitate a balanced growth of the world fertilizer industry.

The opportunities for co-operation between developing countries at the subregional, regional and inter-regional levels, and the international support needed for that co-operation."

The Consultation Meeting urged the Executive Director to initiate an in-depth examination of the subjects proposed and, if necessary, to establish suitable working groups for the purpose. The results of the in-depth examination should be placed before the Second Consultation Meeting.

2. The Industrial Development Board, UNIDO's Governing Body, considered proposals made by the UNIDO Secretariat for examining these four topics at its Eleventh Session in April/May 1977.^{1/} It approved the proposals made and agreed that a Second Consultation Meeting on the Fertilizer Industry should be held in 1978.^{2/}

^{1/} See pages 12-16 of ID/B/175 the document submitted to the Industrial Development Board by the UNIDO Secretariat.

^{2/} See para.158 of ID/B/193, the Report of the Industrial Development Board on its Eleventh Session.

3. The purpose of the Progress Report is to describe the action which the UNIDO Secretariat has taken to implement the recommendations of the First Consultation Meeting. The results achieved are presented in summary form in this Progress Report; in the text, reference is made to the Report of the Meetings which have been convened to examine these topics (a list of such meetings is attached as Annex A); reference is also made to the issue papers and background papers (Annex B) that will be submitted to the Second Consultation Meeting. Thus, an over-all review of the progress achieved by the UNIDO Secretariat in implementing the recommendations made by the First Consultation Meeting can be obtained from this Progress Report.
4. In addition to the four topics listed above, the First Consultation Meeting made a number of other recommendations. The UNIDO Secretariat was requested: (i) to prepare a detailed document on the infrastructure for fertilizer plants; (ii) to establish an information and data bank service on new and existing processes, plant and equipment and project and equipment costs in the fertilizer industry; (iii) to study the past experience of developing and developed countries in establishing fertilizer plants; (iv) to establish a panel of experts on the fertilizer industry to provide a broad range of consulting services; (v) to examine the possibility of establishing (a) regional testing facilities and (b) an interregional centre for the standardization of design of fertilizer plants and equipment in developing countries. The progress made in implementing these is considered in a later section of this Progress Report.
5. One such specific recommendation was that the Draft UNIDO World-Wide Study of the Fertilizer Industry 1975-2000 (UNIDO/ICIS.22/Rev.1 of 28 December 1976) should be revised. The Second World-Wide Study of the Fertilizer Industry (UNIDO/ICIS.81 of 11 September 1978) is submitted to the Second Consultation Meeting for consideration. The Study has been prepared taking account of the comments and suggestions received at the First Consultation Meeting. It does not aim to cover the four topics

listed in paragraph 1 above, since these are covered by this Progress Report and other documents presented to the Second Consultation Meeting.

6. The examination of the two following subjects is far enough advanced for the UNIDO Secretariat to suggest that agreement at the Second Consultation Meeting might be reached on them:

- (a) the Model Form of Cost Reimbursible Contract for the Construction of a Fertilizer Plant (an ammonia/urea complex); 1/
- (b) guidelines for the demarcation of responsibility for establishing and financing the infrastructure required for the production and distribution of fertilizers and arrangements, terms and conditions for the financing of such infrastructure. 2/

7. On some of the other subjects recommended for examination by the First Consultation Meeting, the progress reported in this document shows that before further work is undertaken by the UNIDO Secretariat, guidance from the Second Consultation Meeting is required on some basic principles. On the remaining subjects, it is expected that lines of further action will be clearly indicated by the Second Consultation Meeting.

1/ See the Issue Papers "The Preparation by UNIDO of Model Forms of Contract for the Construction of a Fertilizer Plant and Guidelines for their Use. Progress report and features of model contracts on which international agreement could be reached at the Second Consultation Meeting", ID/WG.281/2 and "Preliminary Draft of the UNIDO Model Form of Cost Reimbursible Contract for the Construction of a Fertilizer Plant", ID/WG.281/12.

2/ See the Issue Paper "Demarcation of responsibility for establishing the Infrastructure required for the Production and Distribution of Fertilizers; Guidelines on which international agreement might be reached at the Second Consultation Meeting", ID/WG.281/8 and Background Paper "Infrastructure required for the Production and Distribution of Fertilizers", ID/WG.281/5.

II. CONTRACT PROCEDURES INTENDED TO ENSURE THE SUCCESSFUL CONSTRUCTION AND OPERATION OF FERTILIZER 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

8. To examine this first topic, UNIDO convened:

- (i) Technical Seminar on Contracting Methods and Insurance Schemes for Fertilizer and Chemical Process Industries, Lahore, Pakistan, 25 - 29 November 1977; 1/
- (ii) First Working Group on Contracts and Insurance for Fertilizer Plants, Vienna, Austria, 14 - 17 February 1978; 1/
- (iii) Meeting of Experts on the Insurance of Consequential Losses incurred by Fertilizer Plants, Vienna, Austria, 18 - 20 September 1978. (Draft Report). 1/

A. Contract Procedures

9. Over 30 participants representing the interests of purchasers and contractors attended the Lahore Seminar. The Seminar considered pre-contracting and contracting methods, model contracts, arbitration, guarantees and penalties, and insurance cover for fertilizer plants.

10. The Lahore Seminar concluded that it would be useful for UNIDO to prepare model forms of four types of contract used for the construction of a fertilizer plant, namely (a) turn-key lump sum; (b) cost reimbursible; (c) semi turn-key; and (d) supply of process know-how and engineering services. The Seminar felt that one of these four principal types of contract would normally be used. UNIDO should also prepare Guidelines on the use of these model forms of contract.

11. The work which UNIDO has undertaken to implement this recommendation is described in a separate document submitted to the Consultation Meeting.^{2/}

^{1/} The Report of these Meetings are available as documents ID/WG.259/26/Rev.2, ID/WG.269/2/Rev.1 and ID/WG.284/1, respectively.

^{2/} The preparation by UNIDO of Model Forms of Contract for the Construction of a Fertilizer Plant and Guidelines for their use: Progress Report and Features of the Model Contract on which International Agreement could be reached at the Second Consultation Meeting (ID/WG.281/2).

With the help of consultants, who met three times to co-ordinate their approach,^{1/} UNIDO has prepared model forms of five types of contract.^{2/} Guidelines on the Use of UNIDO Model Forms of Contract for the Construction of a Fertilizer Plant are being prepared; a preliminary draft will be made available at Innsbruck (Conference Room Paper 1). Annex D lists the proposed Table of Contents of the Guidelines.

12. The preliminary draft of the UNIDO Model Form of Cost Reimbursable Contract for the Construction of a Fertilizer Plant (document ID/WG.281/12) is being submitted to the Consultation Meeting as the most suitable for discussion at this stage of preparation; it is proposed to establish a Working Group to discuss it at Innsbruck. After this it will be revised and published by UNIDO. The preliminary drafts of the model form of the other four types of contract prepared by consultants, which are not yet endorsed by UNIDO, will be made available as background documents at the Consultation Meeting (Conference Room Papers 2 - 5).

13. The Model Forms of Contract have been drafted on the basis of contracts in existence known to the authors who include four purchaser's institutions in developing countries. Their experience as buyers has been used to improve the forms of contract in use at present. The views of contractors will be sought at the Consultation Meeting.

14. A number of the recommendations of the Lahore Seminar have been included in the model contracts. For example, the Lahore Seminar discussed the technical guarantees that should be included in a contract and the contractor's liability to compensate the purchaser if these were not met. A distinction was made between (a) what were called "absolute guarantees" that should apply to the capacity of the plant, the quality of its output and the quality of the effluent, and (b) other guarantees where the

^{1/} The Reports of the First, Second and Third Meetings of the Working Group on Model Contracts for Fertilizer Plants, convened in April, June and August, 1978 have been reproduced as internal documents, UNIDO/EX.40, EX.45 and EX.55).

^{2/} In addition to the four types recommended by the Lahore Seminar a model form of contract for the supply of process know-how and engineering services for a number of similar plants has been prepared.

liability of the contractor should be limited. Maximum level of liability in the form of "liquidated damages" were suggested for different types of contract. It was also agreed at Lahore that the performance test of a fertilizer plant should be of longer duration than used in the past and run for a period of ten days after the plant had operated for about twenty days at at least 80 per cent capacity.

15. Some of the other recommendations of the Lahore Seminar were:

- UNIDO should consider favourably requests from developing countries to send teams of their experts to visit existing plants built by contractors using processes which they are seriously considering for adoption in their new plants.
- UNIDO should help to organize manpower development programmes for operating, maintaining and managing fertilizer and chemical projects for developing countries requiring such programmes.
- For developing countries which lack experience, arrangements could be made between the contractor and the purchaser to extend assistance with the management of the plant for a period of up to twelve months after the test runs have been completed.

16. On the question of arbitration, the Lahore Seminar recommended, inter alia, that experts from developing countries should be included on the Arbitration Panels of the International Chamber of Commerce (ICC) and other arbitration organizations or courts. Some industrialists from developed countries have proposed that UNIDO could offer its services to set up an additional means for parties from developing countries and developed countries to settle international industrial disputes.^{1/}

17. The Second Consultation Meeting may wish to consider specific recommendations outlined above in paragraphs 15 and 16.

^{1/} The Lahore Seminar recommended that consideration should be given to appending to the contract a supplementary document in which procedure and action to be taken in settling disputes be clearly stated. UNIDO has begun to consider what such a document should include.

B. A Multilateral Insurance Scheme to protect the interests of all parties by providing, in particular, adequate compensation for consequential losses

18. The possibility of obtaining insurance to cover all damages, including in particular, consequential losses incurred by fertilizer plants was examined in a preliminary way by the Lahore Seminar, convened in November 1977, in a broader context by the Working Group convened in February 1978, and in depth (as far as commercial sources are concerned) at the Meeting of Experts in September 1978.

19. The Lahore Seminar drew attention to the cover that was already available under existing forms of insurance policy, namely (a) an Erection All Risks (EAR) Policy covering the period of construction and performance tests up to handover of the plant and (b) a Machinery Breakdown Policy covering the period after handover. To cover consequential losses, an EAR Loss of Advanced Profits Policy could be taken out for the construction period and a Machinery Breakdown Loss of Profits Policy for the initial period of operating the plant.^{1/} However, this latter type of policy would normally not be issued until after the first 12 months of a plant's operation. During this observation period, the equipment included in the plant is still under a manufacturer's guarantee and the operators of the plant have not been fully trained.

20. The First Working Group on Contracts and Insurance, convened in February 1978, recognized that the best insurance for the purchaser was to select a reliable contractor and make a sound contract with him and obtain a performance bond. If necessary the advice of a consulting engineer and legal adviser should be sought. However, even if all such precautionary measures were taken, there would remain a risk that the plant might perform inadequately as a result of defects in design and equipment and give rise to substantial consequential losses for the purchaser.

^{1/} See "Insurance Cover Available from Commercial Sources relating to the Construction and Initial Operation of Fertilizer Plants", document ID/WG.259/5.

21. To cover the consequential losses arising from such events, the Working Group recommended that an attempt should be made to obtain insurance to cover such events jointly in the name of the purchaser and the contractor. The meeting drafted the following clause for this purpose and suggested it be included in the model forms of contract being drafted by UNIDO:

"In addition to the standard insurance policies required under other articles in the Contract, the Buyer and Contractor shall, to the extent possible, by mutual arrangement obtain an Insurance cover in the name of the Buyer for consequential loss caused by defective design, material or workmanship and defective construction or erection within the control of the contractor or his subcontractors, suppliers or manufacturers. No liability shall, however, attach to the Buyer or the Contractor purely by reason of payment of the premium for such policy". (Paragraph 50 of ID/WG.269/2.Rev.1)

22. The Working Group drafted a Questionnaire on the performance of fertilizer plants and in the period May to August 1978, UNIDO addressed this Questionnaire to over 100 plant owners in the developing countries. Answers were received from 33 plants built in developing countries. They showed that defects in design were a relatively rare event as compared to breakdown of machinery. ^{1/}

23. The insurance experts from developed and developing countries participating in the September Meeting rejected the suggestion of the Working Group of February 1978 that the insurance industry should cover the complete range of possible causes of consequential losses listed in paragraph 50 of the Working Group Report. The Meeting distinguished between three types of defective design: (a) defect in the know-how or basic engineering, (b) negligence during the detailed engineering, and (c) defects in the design of different items of equipment. In each of these cases, the cause was directly the responsibility of the contractor or supplier of equipment. Hence for the insurance industry to provide cover for these risks would be to assume risks that are much better understood by the contractor and the supplier of equipment.

^{1/} An analysis of the answers to this Questionnaire is included as Annex A of the Draft Report of the Meeting of Experts on the Insurance of Consequential Losses incurred by Fertilizer Plants, Vienna, Austria, 18 - 20 September 1978 (ID/WG.284/1).

24. The insurance experts therefore indicated that insurance to cover the complete range of possible causes of consequential losses could not be taken out for the benefit of the purchaser jointly by the purchaser and contractor, as was suggested by the February Working Group. Instead existing forms of insurance cover should be used and an attempt should be made to shorten the 12-months observation period. In addition, the contract document should include contractual guarantees on the performance of the fertilizer plant and the possible consequential losses that could arise in the event of defective design.

25. If the contractor required cover in the form of insurance to help him meet part of his liability for such consequential losses, he could seek it under professional indemnity or other types of liability insurance cover. The contractor would be expected to meet the other part of the liability himself. The international insurance market at present has only restricted capacity to insure this type of risk and it approaches such insurance on a highly selective basis.

26. The UNIDO Secretariat suggested to the February 1978 Working Group that an alternative to commercial insurance would be for the Government of the supplier country to guarantee the performance of plant and equipment supplied to a developing country and provide adequate compensation when consequential losses arise from such causes. Representatives of National Export Credit Insurance Agencies were invited to participate in the February 1978 Working Group to consider this proposal. The representatives of three National Export Credit Insurance Organizations pointed out that they were given narrow terms of reference and the new type of insurance proposed fell outside their field of activity.

27. It was suggested, however, that Governments or international organizations might be willing to assist the establishment of such an insurance scheme if commercial insurers were prepared to take the responsibility for assessing the risk involved and for implementing the scheme. If, for example, it was found that commercial insurers could only undertake to cover one third or one half of the risk, it might be that Governments or public organizations could be approached to cover the remaining part.

28. UNIDO's investigation of this topic shows that the world commercial insurance market, comprising national insurance companies and re-insurance facilities throughout the world, constitutes what could be called a multinational insurance scheme with considerable experience in insuring the risks faced by fertilizer plants. However, it appears to the UNIDO

Secretariat that the commercial insurance industry will be unlikely to be prepared to cover consequential losses arising from defective design and equipment until a plant has operated successfully for a period of up to twelve months ^{1/} because it considers such risks to be uninsurable. The purchaser of a fertilizer plant will, therefore, have to seek other ways in which to obtain adequate compensation for consequential losses arising from such defects which appear in this period.

29. As a result of the examination of this topic reported above, the UNIDO Secretariat suggests that the guarantee on the performance of complete plants and equipment might best be given by the Government of supplier's country. ^{2/} At present many Governments support their exports with export credit insurance; to minimise the risk involved, the concerned Agency often obtains a counter-guarantee from the Central Bank of the buyer's country. All this benefits the supplier and not the developing country. If the performance of plant and equipment were to be guaranteed by the supplier's Government, the developing country would receive some assurance of performance; the supplier might then be asked by his Government to provide a counter-guarantee on the performance of the plant and equipment sold.

30. The Second Consultation Meeting is therefore invited to consider whether the Government of countries supplying plant and equipment will be prepared to consider in principle the possibility of being involved in providing a guarantee of the performance of plants and equipment supplied to developing countries to the extent of providing adequate compensation for consequential losses arising from inadequate performance. Depending on the answer to this question, this topic may warrant further examination by UNIDO.

^{1/} The September 1978 Meeting of insurance experts suggested that UNIDO should continue to collect information on the major causes of consequential losses in fertilizer plants built in both developed and developing countries. Such information, it was felt, could help those establishing new fertilizer plants to minimize risks of incurring consequential losses themselves.

^{2/} The same suggestion was made by UNIDO in November 1976 to the Preparatory Meeting for the First Consultation Meeting. (ID/WG.236/2, para 42).

III. WAYS AND MEANS TO REDUCE THE HIGH COST OF FERTILIZER PLANTS AND OF MOBILIZING THE LARGE VOLUME OF FUNDS REQUIRED FOR INVESTMENT

31. The First Consultation Meeting recognized the high costs involved in establishing fertilizer plants and indicated that if the developing countries' objectives in the fertilizer production field were to be successfully achieved, measures to bring down investment costs should be urgently considered. In this connection, UNIDO, UNCTAD and other appropriate organizations should consider looking into the justification of some recent increases in the prices of equipment and services. UNIDO convened an Expert Group Meeting to consider this topic in April 1978.^{1/}

A. Ways to reduce the cost of fertilizer plants

32. The Meeting found that the cost of nitrogenous fertilizer plants built in Western Europe had increased by 10 per cent to 16 per cent per annum in the period 1970-1977, 3 per cent to 10 per cent above the assumed inflation rate. The cost of plant erection and the cost of "off-sites" and other expenses were reported to have increased faster than the cost of equipment and machinery in those plants located in developed countries. As a result the cost of a complete plant for which bids were received in 1977 was (when expressed in US dollars) between two and three times the cost seven years earlier. The Meeting guessed that the cost of phosphate fertilizer plants had probably increased to the same extent.

33. The impact on costs of production of these higher plant costs was analysed by a staff member of the World Bank in a paper presented to the FAO Commission on Fertilizers in September 1977.^{2/} This paper was made available to the Expert Group Meeting.

34. The main findings of the Expert Group Meeting can be summarized as follows:

^{1/} Expert Group Meeting on Fertilizer Plant Cost Reduction and Ways to Mobilize Sufficient Financing, Vienna, Austria, 11-14 April 1978. See Report of the Meeting, ID/WG.274/17/Rev.1.

^{2/} Investment and Production Costs for Fertilizers (FERT 77/4) of August 1977, a paper prepared by W. F. Sheldrick for the Fourth Session of the FAO Commission on Fertilizers, Rome, Italy, 27-30 September 1977.

- (a) Engineering services and equipment account for about two-thirds of the cost of a plant. Competitive bidding could help to reduce these costs, although procurement expenses might then be increased. A discussion between owners in developing countries on all aspects of plant procurement and implementation would be useful.
- (b) It would be useful to standardize plant capacities. Equipment suppliers should be persuaded to standardize rotating machines and major equipment items to the greatest possible extent.
- (c) Plants built in developing countries used a high degree of automation and instrumentation. Such use should be subject to careful analysis bearing in mind the importance of safety for proper operation of the plant.
- (d) Delays at any stage in implementation of a fertilizer project increase the cost of a plant. Increased co-operation between the purchaser and contractor was desirable.
- (e) Inadequate project planning could increase plant costs and inexperienced buyers should seek the advice of consulting engineers.
- (f) Import duties and taxes added as much as 10 per cent to the total cost of a plant in some developing countries. Governments should consider removing or reducing this burden on plant costs.
- (g) The investment cost of some fertilizer plants was increased by the cost of constructing infrastructure outside the battery limits of the plant. Such investment should be undertaken by the Government and/or on concessionary terms of finance.
- (h) Greater use should be made of indigenous engineering personnel; where fabricating capabilities existed, local suppliers should be used to the maximum extent possible.
- (i) Civil works accounted for approximately 10 to 15 per cent of the cost of the plant. Savings could be achieved by careful site selection and plant lay-out, appropriate design and improved construction methods.
- (j) The high cost of expatriate personnel of engineering contractors deputed to the site, as well as those of vendors service men, could be reduced by giving commitments on the rate and period that they would be fielded at the time of signing the contract for constructing the plant.
- (k) Use the same design engineering drawings for the construction of a set of duplicate plants.

- (1) Ways to avoid sharp fluctuations in the number of plants under construction might be considered as a possible subject for the Second Consultation Meeting to consider.
35. Most of the areas of cost reduction identified above depend on the initiative of the purchaser and full co-operation of the contractor. Some other areas will be covered when UNIDO Model Forms of Contract and Guidelines for their Use become available. The most promising ways of cost reduction to which UNIDO could organize a contribution involving international co-operation appear to be items (a), (b), (c) and (k). Item (l) is related to the topic considered in part IV of this paper. The Second Consultation Meeting is invited to suggest what further work might be carried out on these four areas of potential cost reduction.
36. When the First Consultation Meeting considered the desirability of standardizing the design of plant and equipment of fertilizer plants, it found that it would not be possible to have uniform design standards for all countries. In particular standardization would be relatively more difficult for phosphate fertilizer plants. However, considering that standardization is one of the most promising ways to reduce plant costs, the Second Consultation Meeting may wish to endorse the suggestion of the Expert Group that capacities and other design features of ammonia/urea plants be standardized; it may consider how agreement on international standards for some major items of equipment could be approached^{1/} and how the harmonization of engineering standards might be approached internationally.
37. A specific recommendation on how further work in this area of standardization should proceed would be a useful conclusion for the Second Consultation Meeting to reach.

^{1/} A useful starting point would be the paper presented to the Meeting entitled Suggestions for increasing standardization of ammonia plant capacities and equipment by Frank C. Brown, ID/WG.274/7.

B. Mobilizing the investment required for fertilizer plants

38. As regards mobilizing the investment required to construct new fertilizer plants in developing countries, the Expert Group Meeting in April found that sufficient financing was generally available at present and that there was so far no indication that problems would arise in the future, given the priority attached to fertilizer plants by sources of financing.

39. As regards terms and conditions under which financing was provided, the experts suggested that instead of commercial rates of interest, fertilizer plants should not pay a higher rate than agricultural projects. As regards the formal terms of financing, the most serious problems arose from inadequate grace periods before repayment of loans commenced. UNIDO was asked to examine solutions to this problem developed by various banks from the borrower's point of view.

40. The crucial importance of completing new fertilizer plants in time to meet agricultural needs meant that every effort should be made to ensure that mobilization and administration of finance did not delay project completion. Fertilizer plants in this respect were a special case which the Meeting felt might justify exception to established and otherwise well-justified procedures.

41. The Meeting also noted that co-financing had now become such an established practice that the harmonization of terms, rules and procedures should be seriously considered by the financing agencies principally concerned. Suppliers of finance should appoint one person to represent them in dealings with the plant owner and his contractor.

42. The Meeting recognized that whilst sufficient financing had been made available for fertilizer plants, it was often difficult to obtain the additional financing needed for (a) the infrastructure that the plant required and (b) for the much larger investment in the infrastructure needed to distribute fertilizers. The Meeting suggested that the financing of the plant and infrastructure costs should be separated with the aim of (a) obtaining concessionary terms for the infrastructure portion and (b) excluding the costs of infrastructure from the assessment of the project's viability. ^{1/}

^{1/} These recommendations are considered in the Issue Paper on infrastructure (ID/WG.281/8) to be considered under agenda item 5 (b).

43. There is one major issue on the topic of financing fertilizer plants that the fertilizer industry and Governments face. There is insufficient incentive to build new fertilizer capacity at current prices; if the price of fertilizers is increased it will reduce the incentive to use them. Fertilizer plant costs have more than doubled since 1970 and energy costs have increased even more; however food prices have risen much less. The benefit/cost ratio achieved by applying fertilizer has therefore fallen in many countries to a level where the application of fertilizers is not sufficiently encouraged. So long as this situation continues, it is difficult to see how the fertilizer industry in developing countries can flourish as it should without heavy subsidizing of investment costs or its operations.

44. There are various ways of overcoming this situation which the Second Consultation Meeting could discuss, namely:

- (a) exports of plant and equipment could be subsidized;
- (b) grants could be made for the infrastructure associated with a fertilizer plant; or
- (c) fertilizer plants could be treated as a public service like a hospital where continuing operating losses would be accepted by the Government to accommodate the need for low-cost fertilizers as an input for low-cost food.

45. In discussing the subject of financing, therefore, the Second Consultation Meeting is invited to consider whether economic viability (as traditionally measured) is a relevant criteria when the establishment of a new fertilizer plant in a developing country is considered^{1/}. If a different approach, which makes fertilizer plants a special case, is to be followed, then the Consultation Meeting might suggest how the various possible solutions listed above should be considered further by UNIDO and the interested parties.

46. When considering this further work, Part IV of this paper is also relevant, in particular, paragraphs 56 and 57.

^{1/} The Consultation Meeting may wish to note that the financing of industrial projects in the fertilizer industry and in other sectors covered by UNIDO Consultation Meetings will be discussed at an Expert Group Meeting in December 1978; it may therefore wish to suggest some points that should be raised at this Meeting.

IV. CONTINUOUS MONITORING OF THE GROWTH OF FERTILIZER PRODUCTION CAPACITY AT THE NATIONAL, REGIONAL AND GLOBAL LEVEL IN ORDER TO FACILITATE A BALANCED GROWTH OF THE WORLD FERTILIZER INDUSTRY

47. The First Consultation Meeting recognized the need for more fertilizer production within the developing countries in order to meet increased consumption and to assist industrial development. It suggested the following objectives:

- a) the achievement by the developing countries of self-sufficiency in fertilizer production as soon as possible and in any case by the year 2000;
- b) the production by the developing countries of a surplus for export; and
- c) the maintenance of a reasonable balance between supply and demand in the world market.

Hence, the third topic that the First Consultation Meeting recommended to UNIDO to examine was continuous monitoring of the growth of fertilizer production capacity at the national, regional and global level in order to facilitate the balanced growth of the world fertilizer industry.

48. When the UNIDO Secretariat made proposals for implementing this recommendation to the Industrial Development Board in May 1977, it recommended that this third topic should be examined by the existing UNIDO/FAO/World Bank Working Group on Fertilizers ^{1/} whose work in this field the First Consultation Meeting had praised. Specifically it was suggested (a) monitoring of the growth of world fertilizer production capacity be undertaken by the Joint Working Group, (b) information at the national level as well as at the regional and global levels be released and checked by UNIDO with Governments, (c) that the Joint Working Group prepare a report on this topic for the Second Consultation Meeting.

49. When the Joint Working Group met in June 1977 it was of the view that both production capacity and demand for fertilizers should be considered. National forecasts of production capacity should not be published. ^{2/} The forecasts prepared by the Joint Working Group of production capacity, supply capability and demand should be used for the Second UNIDO Consultation Meeting. These forecasts have been included in the Background Paper on this topic. (ID/WG.281/14).

^{1/} Referred to hereafter as the "Joint Working Group".

^{2/} Subsequently, at its meeting in June 1978, the Joint Working Group agreed that UNIDO should prepare a list of new fertilizer production capacities being constructed in developing countries.

50. The information required to monitor the growth of fertilizer production capacity has been assembled by UNIDO in a Background Paper (ID/WG.281/14). This paper summarises the forecasts of production capacity, supply capability and demand of the Joint Working Group for the next five years and also includes the Group's estimates of demand in the year 1987. In the Second World-Wide Study of the Fertilizer Industry, UNIDO has used the series of data on consumption from 1950 to 1977 and these forecasts to 1987 as a period of 37 years on which to base forecasts of demand at the regional and global level up to the year 2000. The results of this forecasting exercise are summarised in the Study and are also included in the Background Paper prepared for the Consultation Meeting.

51. The forecast of fertilizer consumption made in the Study confirms UNIDO's estimate of the share of total world production of fertilizers that developing countries will need to achieve by the year 2000 if they are to be self-sufficient. Whereas the first Draft Study indicated that self-sufficiency would require a 40% share of world production of nitrogenous and phosphate fertilizers (but excluding potash), the Second World-Wide Study suggests a share of world consumption of each nutrient as follows:

Share of developing countries in world fertilizer consumption (percent)

<u>Actual</u>	<u>N</u>	<u>P₂O₅</u>	<u>K₂O</u>
1950/51	9.3	3.5	2.1
1960/61	21.7	7.7	5.5
1970/71	27.1	16.3	10.0
1976/77	30.5	23.1	11.4 a/
<u>Forecast</u>			
1982/83	35.4	27.3	15.0
1987/88	38.9	32.1	16.6
2000/01	43.6	36.6	18.5

Source: UNIDO Second World-Wide Study of the Fertilizer Industry 1975 - 2000 Annexes B and D.

a/ 1975/1976 data.

52. Monitoring can be viewed in three time horizons:

- short-term to 1982 (where firm commitments have been made to construct new capacities)
- medium-term 1982 - 87 (where new projects are in the idea and planning stage)
- long-term to 1987 - 2000 (where developments are more difficult to forecast)

53. An overall conclusion in the short-term that can be drawn from the estimates of world demand and supply capability prepared by the Joint Working Group is that for nitrogenous, phosphate and potash fertilizers there will be sufficient capacity to meet world demand over the next five years. There appears to be a considerable safety margin available in the case of all three nutrients - nitrogen, phosphate and potash.

54. The Background Paper shows that whilst expansion of capacity has generally slowed down in developed countries (the CMEA countries are an exception), the growth of the supply capability of developing countries will allow further progress towards self-sufficiency in the production of both nitrogen and phosphate fertilizers by 1982/83. However, with the exception of one new producer in a developing country, the developing countries will continue to rely on developed countries for their supply of potash.

55. A possible cause for concern in the period up to 1982/83 is the low level of capacity utilization assumed in the estimate of supply capability in developing countries forecast by the Joint Working Group in the next five years. In part, this is due to the anticipated delays in achieving full capacity output in new plants. The Joint Working Group also assumes that a new plant in the developing country will only reach a maximum rate of capacity utilization equal to the average rate already achieved by existing plants in that country. The Consultation Meeting may wish to comment on this last assumption and ways to improve this situation.

56. As regards the medium-term, the limited information on the plans of developing countries assembled in the Background Paper suggests that not enough new investment is being planned in developing countries. The reasons for this were discussed in paragraphs 43 to 45 above. The Consultation Meeting may wish to suggest how solutions should be considered by all the interested parties (that is Governments, farmers, the industry etc.).

57. Bearing in mind the need for more information on short-term and medium-term plans, the Consultation Meeting may wish to consider the following proposals of the UNIDO Secretariat:

- (a) the distribution to Governments by UNIDO twice a year of a report on new fertilizer projects under construction or consideration; this would require the co-operation of participants at the Consultation Meeting;
- (b) at the request of regional or sub-regional groups of developing countries, UNIDO should convene meetings to stimulate and co-ordinate new investment plans in the fertilizer industry in order to avoid the pricing dilemma raised in paragraphs 43 and 44.

58. In the long-term (1987 - 2000), it is a matter of anticipating the effect of future increases in energy costs on the economics of chemical fertilizer production. The Second UNIDO World-Wide Study therefore considers non-conventional sources of fertilizer such as direct fixation of nitrogen, biogas, municipal waste etc. Clearly their growing contribution to world fertilizer requirements in the period 1985 - 2000 needs to be assessed.

V. THE OPPORTUNITIES FOR CO-OPERATION BETWEEN DEVELOPING COUNTRIES AT THE SUB-REGIONAL, REGIONAL and INTER-REGIONAL LEVELS AND THE INTERNATIONAL SUPPORT NEEDED FOR THAT CO-OPERATION

59. To examine this fourth topic recommended by the First Consultation Meeting, UNIDO convened an Expert Group Meeting in February 1978 ^{1/} Participants from 14 developing countries attended the Meeting and reached the following main conclusions:

- (a) there were specific project opportunities which would use natural gas, phosphate or potash resources of one country to supply the fertilizer markets of other countries. When requested, UNIDO should take action to promote these projects;
- (b) UNIDO should convene a working group to promote co-operation among developing countries in the phosphate fertilizer industry;
- (c) UNIDO should make a study of ways of ensuring an adequate supply of fertilizers for least developed countries and other developing countries with a small population;
- (d) international, regional and bilateral financial institutions should continue to use their financing to support fertilizer projects which enhance co-operation between developing countries;
- (e) UNIDO should assist regional organizations of fertilizer producers and bring together all regional associations and encourage their objectives;
- (f) UNIDO and other international organizations should assist sub-regional groups in formulating proposals for co-operation in implementing their fertilizer projects;
- (g) UNIDO should contribute to the financing of the new Regional Fertilizer Information and Advisory Services project sponsored by ESCAP, FAO and UNIDO. The establishment of similar projects in other regions could also be supported by UNIDO if they are requested;
- (h) fertilizer development centres should be established in some regions to provide training, trouble-shooting, information, information and other common services;
- (i) UNIDO should involve experts from developing countries in its consultancy/advisory service for the fertilizer industry. A detailed proposal on the formation and functions of the service should be presented to the Second Consultation Meeting. For this purpose UNIDO should prepare a roster of persons and organizations able to produce such services;
- (j) UNIDO should publish a directory of all fertilizer producers in developing countries and disseminate other up-to-date information of interest to fertilizer manufacturers on a regular basis, inter alia, through the UNIDO Newsletter.

^{1/} Report of the Expert Group Meeting on Regional Co-operation among Developing Countries in the Fertilizer Industry, Vienna, 8 - 10 February 1978 (ID/WG.265/11/Rev.1).

60. Seven out of the ten recommendations of the Meeting are addressed to UNIDO; one, item (d), is addressed to financing institutions, and the remaining two, items (a) and (h), although addressed to developing countries may later on require UNIDO's involvement. The initiative to organize co-operation amongst developing countries, it appears from this Meeting, must come from UNIDO rather than from the countries themselves. The UNIDO Secretariat feels that the initiative should come from developing countries and that the Second Consultation Meeting should devote some time to consider possible approaches on the understanding that UNIDO will support such initiatives.

61. To stimulate further thought on this topic, UNIDO invited a consultant to prepare a Background Paper which identifies potential areas of co-operation.^{1/} This paper suggests some practical ways in which developing countries could use their own experience to help plan and implement new fertilizer projects, train operating staff etc. It also considers opportunities for co-operation between two countries or at the sub-regional level in establishing fertilizer plants, the form co-operation agreements might take, the way to approach negotiations and the benefits which such co-operation might yield.

62. A detailed study has been prepared by UNIDO on ways to ensure adequate supplies of fertilizers for least developed countries, and will be made available at the Consultation Meeting as a Conference Room Paper. A summary of the study is presented to the Meeting as a Background Paper (ID/WG.281/9). In preparing this study, UNIDO has received very useful co-operation from FAO.

63. To implement recommendation (b) above, UNIDO planned to convene a Working Group to Promote Co-operation among Developing Countries in the Phosphate Fertilizer Industry in early September 1978; however there was only a limited response to UNIDO's invitations to attend at the participant's expense and the Meeting was cancelled. Instead, there will be an opportunity to discuss specific investment opportunities at the Investment Promotion Meeting which will follow the Consultation Meeting and be held in the Kongresshaus, Innsbruck on 11 November. Arrangements for this meeting are described in document ID/WG.281/11.

64. UNIDO feels that it would be useful to establish fertilizer development centres in a number of regions as recommended in item (h). Proposals have been discussed with the Arab Federation of Chemical Fertilizer Producers. A proposal has been developed for African countries and as was requested by the Expert Group Meeting it has been submitted to the OAU. This proposal will be available for representatives from African countries to consider at Innsbruck.

^{1/} Opportunities for Co-operation amongst Developing Countries in the Fertilizer Industry, ID/WG.281/4.

65. As regards item (f), UNIDO is already assisting the Andean Group of countries and the countries in Central America to formulate proposals for co-operation in establishing fertilizer projects. In the past it has assisted the ASEAN countries and it is prepared to assist other regional groups at their request.
66. As regards item (j), UNIDO is prepared to publish a directory of all fertilizer producers in developing countries. This is one of the projects which has been approved by UNIDO's Industrial Development Board as part of the information service.
67. The examination of this subject has developed many ideas on form and areas of co-operation amongst developing countries at the subregional, regional and interregional level. The initiative for implementing them must come from the developing countries themselves. The UNIDO Secretariat expects this topic to be discussed further so that UNIDO receives clear guidance on its role in implementing the suggestions made.

VI. PROGRESS MADE IN IMPLEMENTING OTHER RECOMMENDATIONS OF
THE FIRST CONSULTATION MEETING

A. Infrastructure for the Production and Distribution of Fertilizers

68. The First Consultation Meeting requested UNIDO to prepare a detailed document on the infrastructure required for fertilizer plants (paragraph 69 of its Report). UNIDO has prepared a Background Paper entitled "Infrastructure Required for the Production and Distribution of Fertilizers" (ID/WG.281/5). This paper identifies the various items of infrastructure required and, on the basis of case studies, suggests a demarcation of responsibility for establishing them. It also considers the terms and conditions that would be appropriate for financing such investments.

69. A summary of this paper (ID/WG.281/5) has been prepared on this topic which argues that lack of clear demarcation of responsibility for establishing such infrastructure has been an obstacle to making appropriate arrangements to finance all the infrastructure required. To facilitate a clear statement by the Consultation Meeting, which would reflect international agreement of Governments and fertilizer enterprises on this topic, UNIDO included in this document the text of a set of Guidelines which:

- (a) identify all items of infrastructure;
- (b) make a clear demarcation of responsibility for establishing each item; and
- (c) recommend appropriate terms and conditions for financing such infrastructure.

The Consultation Meeting might approve these Guidelines with such modifications as it deems appropriate; it might also recommend that the Guidelines be applied by Governments, other public authorities, fertilizer enterprises and sources of finance.

B. Establishment of an Information and Data Bank Service for the Fertilizer Industry

70. The First Consultation Meeting considered that it would be useful to establish information and data bank services on new and existing processes, plant and equipment, and project and equipment costs in the fertilizer industry. It suggested that the Executive Director might consider giving priority to the fertilizer industry when recommending to the Industrial Development Board the areas to be covered by the Industrial and Technological Information Bank provided for by General Assembly resolution 3362 (S-VII).

71. As a result of this proposal, the Industrial Development Board included the fertilizer industry as one of the priority sectors to be covered by the

Industrial and Technological Information Bank.^{1/} Information on new and existing processes and on plant and equipment are contained in two new publications which will be made available at the Consultation Meeting.^{2/} In addition, UNIDO in co-operation with the International Fertilizer Development Centre is preparing a revised edition of the UNIDO Fertilizer Manual; the contents of this Manual are described in Annex C. UNIDO has not so far collected sufficient information on project and equipment costs in the fertilizer industry and purchasers of plant are invited to suggest how such information might be collected; it is felt that contractors could also provide a very useful input to this if they were prepared to release information from their files.

C. Study of Past Experience in Establishing Fertilizer Plants

72. The First Consultation Meeting felt that it would be useful to study the past experience of developing and developed countries in establishing fertilizer plants and to examine the successes or failures with a view to providing guidelines for the future. This recommendation was endorsed by the Meeting of insurance experts in September 1978 who felt that such an exercise would help purchasers minimize risks of incurring consequential losses. UNIDO had a response from 33 out of 100 owners of plant in developing countries to its Questionnaire. In order to develop the information required, more detailed questions would have to be answered and a much wider number of plant owners will have to respond. It would be useful if the Consultation Meeting were to support this project and if owners of plant were to promise their co-operation.

D. Establishing a Panel of Experts to Provide Consulting Services

73. A new Technological Advisory Service was initiated on a trial basis by UNIDO at the beginning of 1978 and the fertilizer industry was included as one of 10 sectors to be covered. The Service is available to advise enterprises in developing countries on the terms and conditions of contracts and other aspects of the negotiation of technology, engineering and know-how agreements, etc. When advice is requested, UNIDO endeavours to provide a highly-qualified team of impartial and objective advice through technical and legal experts from both developed and developing countries. Requesting enterprises will be expected to reimburse UNIDO for the direct costs involved.

^{1/} See Report of the Executive Director on establishing the Bank, ID/B/183.

^{2/} Process Technologies for Phosphate Fertilizers, November 1978 Development and Transfer of Technology Series No. 8. ID/209.

Process Technologies for Nitrogen Fertilizers, November 1978, DTT Series No. 9. ID/211.

74. The Expert Group Meeting on Co-operation amongst Developing Countries in the Fertilizer Industry pointed out that some developing countries would appreciate such advisory services from the first conception of a project right up to the signing of the contract to be implemented. The Meeting therefore suggested that the service should furnish consultancy/advisory services in areas such as feasibility studies and project evaluation; selection of contractors, manufacturing processes and technology transfer; plant design and construction supervision; plant operation and maintenance; and the marketing, usage, transportation and warehousing of fertilizers. The Meeting further recommended that a detailed proposal on the formation and functions of the fertilizer consultancy/advisory service should be presented to the Second Consultation Meeting on the fertilizer industry. A document describing the UNIDO consultancy/advisory services which will cover some of the functions suggested above is under preparation.

75. UNIDO has prepared a roster of highly qualified experts and institutions willing to assist UNIDO in the provision of such services. Participants at the Consultation Meeting are therefore invited to inform UNIDO in writing of persons and institutions who could be added to this list.

E. Other Specific Recommendations of the First Consultation Meeting

76. The First Consultation Meeting recommended that UNIDO should examine the possibility of establishing:

- (a) regional testing facilities needed for the adequate maintenance of fertilizer plants; and
- (b) an inter-regional centre to examine and promote opportunities for standardization of design of fertilizer plants and equipment in developing countries

77. The adequate maintenance of fertilizer plants requires much more than regional testing facilities. In some countries it is the practice to maintain one team to carry out maintenance of a group of plants at the "annual shut-down". It was therefore felt that if this suggestion was to be examined, it should be considered in this broader context. A project similar to that suggested has been considered by the members of the Arab Federation of Chemical Fertilizer Producers. The proposal has encountered some difficulties. UNIDO feels that some further clarification of the interest of developing countries in pursuing this proposal should be given at the Second Consultation Meeting.

78. The opportunity to standardize the design of fertilizer plants and equipment in developing countries has been considered above in paragraph 36 and 37. If an inter-regional centre was to be established for the benefit of all the developing countries, it would require the support of all developing countries. The opportunity therefore, might be taken at the Second Consultation Meeting to form a small group which could draft what functions such an inter-regional centre might carry out. Once the functions are agreed, UNIDO could then elaborate a more detailed proposal and submit it to all potentially interested developing countries for their endorsement. If sufficient interest were shown it could then be submitted to UNDP or UNIDO sources of finance.

VII. CONCLUSIONS - ACTION REQUIRED BY THE CONSULTATION MEETING

79. The examination of the four topics recommended by the First Consultation Meeting has produced the following results: two of the topics examined are ready, in the view of the UNIDO Secretariat, for discussion and agreement at the Second Consultation Meeting.

These are:

- (a) the Model Form of Cost Reimbursable Contract for the Construction of a Fertilizer Plant,
- (b) Guidelines for the Demarcation of Responsibility for Establishing the Financing for the Infrastructure Required for the Production and Distribution of Fertilizers and Arrangements and Terms and Conditions for the Financing of such Infrastructure.

80. The examination of ways to provide adequate compensation for consequential losses incurred by fertilizer plants in developing countries as a result of defective design or defects in plant or equipment has not produced a clear recommendation. Commercial sources of insurance are apparently not prepared to cover all the risks that developing countries wish to cover. It is therefore suggested that the guarantee on the performance of complete plants and equipment might best be given by the Government of the supplier's country. The Second Consultation Meeting is invited to consider whether Governments will be prepared to consider the possibility of being involved in providing such guarantees in the same way as they are involved in export credit insurance.

81. A large number of ways to reduce the high cost of fertilizer plants have been suggested. Most of these are dependent on the initiative of the purchaser and require the full co-operation of the contractor. The most promising suggestion on which international co-operation could make a contribution is the question of standardizing the design of plant and equipment. The Consultation Meeting is therefore invited to consider and recommend how further work in this area of standardization should proceed.

82. The examination showed that there should be no difficulty in mobilizing the investment required for fertilizer plants. However, there is a need to make investment in fertilizer plants more attractive in developing countries. It is suggested that economic viability is not a relevant criteria when considering the establishment of a new

fertilizer plant in a developing country. A different approach is needed and alternative ways of making investment more attractive have been suggested. The Consultation Meeting is invited to suggest how the various possible solutions considered might be further examined by UNIDO and the interested parties.

83. The monitoring of the growth of the world fertilizer industry shows that there is under way a considerable expansion of capacity in the developing countries and in some developed countries; in other developed countries there is very little new capacity being added. The developing countries are therefore increasing their share of total world production and are making steady progress towards self-sufficiency. However available information suggests that not enough new capacity is being planned in several regions of the developing world. More information is needed on plants under construction or consideration in both developing and developed countries. The Consultation Meeting is therefore invited to endorse the UNIDO Secretariat's suggestion that:

- (a) UNIDO distribute to Governments twice a year a report on new fertilizer projects under construction or consideration, and
- (b) UNIDO should, at the request of sub-regional or regional groups in developing countries, convene meetings to stimulate and co-ordinate investment plans in the fertilizer industry.

84. Examination of opportunities for co-operation between developing countries has revealed a large number of ideas. However, most of these are addressed to the UNIDO Secretariat and do not depend, as they should, on the initiative of the developing countries concerned. The Second Consultation Meeting is therefore invited to devote some time to consider possible approaches to such co-operation and to recommend to UNIDO specific ways in which UNIDO can play a role in implementing the most promising suggestions.

85. As regards the implementation of other recommendations of the Consultation Meeting, the report provides information on the progress made. No action is required by the Consultation Meeting.

ANNEX A

REPORTS OF MEETINGS CONVENED BY UNIDO TO EXAMINE TOPICS
RECOMMENDED BY THE FIRST CONSULTATION MEETING

		<u>Languages available</u>
ID/WG/259/26/Rev.2	Technical Seminar of Contracting Methods and Insurance Schemes for Fertilizer and Chemical Process Industries. Lahore, Pakistan 25 - 29 November 1977.	E F S
ID/WG/269/2/Rev.1	First Working Group on Contracts and Insurance for Fertilizer Plants. Vienna, Austria 14 - 17 February 1978.	E F S
ID/WG/284/1	Meeting of Experts on the Insurance of Consequential Losses Incurred by Fertilizer Plants. Vienna, Austria 18 - 20 September 1978 (Draft Report)	E
ID/WG/274/17/Rev.1	Expert Group Meeting on Fertilizer Plants Cost Reduction and Ways to Mobilize Sufficient Financing, Vienna, Austria 11 - 14 April 1978.	E F S
ID/WG/265/11/Rev.1	Expert Group Meeting on Regional Co-operation among Developing Countries in the Fertilizer Industry. Vienna, Austria 8 - 10 February 1978.	E F S
<u>Internal Reports (not available to participants)</u>		
	Fourteenth Meeting of UNIDO/FAO/IBRD Working Group on Fertilizers, Rome, Italy 13 - 17 June 1977.	E
	Fifteenth Meeting of UNIDO/FAO/IBRD Working Group on Fertilizers, Paris, France 19 - 23 June 1978.	E
UNIDO/EX.40	First Meeting of the Working Group on Model Contracts for Fertilizer Plants. Vienna, Austria 10 April 1978.	E
UNIDO/EX.45	Second Meeting of the Working Group on Model Contracts for Fertilizer Plants. Vienna, Austria 12 - 23 June 1978.	E
UNIDO/EX.55	Third Meeting of the Working Group on Model Contracts for Fertilizer Plants. New Delhi, India 21 - 25 August 1978.	E

ANNEX B

LIST OF ISSUE PAPERS AND BACKGROUND PAPERS
PREPARED FOR SECOND CONSULTATION MEETING

(Arranged in the order they are referred to
in this Progress Report)

II.A Contract Procedures

	<u>UNIDO Document</u>	
	<u>Number</u>	<u>Language</u>
The Preparation by UNIDO of Model Forms of Contract for the Construction of a Fertilizer Plant and Guidelines for their use. Progress report and features of model contracts on which international agreement could be reached at the Second Consultation Meeting	ID/WG. 281/2 Issue Paper	E F S R
Preliminary Draft of the UNIDO Model Form of Cost Reimbursable Contract for the Construction of a Fertilizer Plant	ID/WG.281/12 Issue Paper	E later F S R
Preliminary Draft of the Model Form of Turn-Key Lump-Sum Contract for the Construction of a Fertilizer Plant by National Industrial Design and Services Corporation, Pakistan	CRP/2*	E
Preliminary Draft of Model Form of Contract for Supply of Process Know-How and Engineering Services for the Construction of a Fertilizer Plant by Fertilizer Corporation of India Limited.	CRP/3*	E
Preliminary Draft of Model Form of Contract for the Supply of Process Know-How and Engineering Services for the Construction of a number of similar Fertilizer Plants by Mexican Institute of Petroleum	CRP/4*	E
Preliminary Draft of Model Form of Semi-Turn-Key Contract for the Construction of a Fertilizer Plant by I. Tartar, Chemokomplex, Hungary	CRP/5*	E
Preliminary Draft of Guidelines for the use of UNIDO Model Forms of Contract	CRP/1*	E
Training of personnel for start-up and operation of a new Fertilizer Plant by P.T. Pupuk Sriwidjaja P.T. PUSRI, Jakarta, Indonesia (To be included in Guidelines for the use of UNIDO Model Forms of Contract as chapter X)	ID/WG.281/1 Background Paper	E

II.B Multilateral Insurance Scheme

No Issue or Background Papers prepared

III.A Ways to reduce the cost of fertilizer plants

No Issue or Background Papers prepared

	<u>Number</u>	<u>Language</u>
III.B <u>Mobilizing the investment required for fertilizer plants</u>		
No Issue or Background Papers prepared		
IV. <u>Monitoring of the growth of fertilizer production Capacity</u>		
Continuous Monitoring of the growth of fertilizer production capacity at the national, regional and global levels in order to facilitate a balanced growth of the world fertilizer industry	ID/WG.281/14	E later F S R
V. <u>Opportunities for Co-operation amongst developing countries</u>		
Opportunities for Co-operation amongst developing countries in the Fertilizer Industry	ID/WG.281/4 Background Paper	E later F S
Opportunities in least-developed countries to Establish Facilities for the Production and Distribution of Fertilizers and the International Co-operation required	ID/WG.281/9 Background Paper	E later F S
FAO Fertilizer Activities	ID/WG.281/3 Background Paper	E
VI. <u>Progress made in implementing other recommendations of the First Consultation Meeting</u>		
<u>General</u>		
Second World-Wide Study of the Fertilizer Industry 1975 - 2000	UNIDO/ICIS/81 Background Paper	E
VI.A <u>Infrastructure for the production and distribution of fertilizers</u>		
Infrastructure required for the Production and Distribution of Fertilizers	ID/WG.281/5 Background Paper	E later F S R
Demarcation of responsibility for establishing the Infrastructure required for the Production and Distribution of Fertilizers: Guidelines on which international agreement might be reached at the Second Consultation Meeting	ID/WG.281/8 Issue Paper	E F S R

ID/WG.281/13

Annex B

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UNIDO documents

	<u>Number</u>	<u>Language</u>
Investment and Production Costs of Fertilizers by W.F. Sheldrick, Chief, Fertilizer Unit, World Bank, August 1977 (Reprint of paper presented to FAO Commission on Fertilizers)	ID/WG.281/10	E

VI.B.C.D.E. Other recommendations

No Issue or Background Papers prepared

ANNEX C

PROVISIONAL OUTLINE FOR THE UNIDO FERTILIZER MANUAL (1979 Edition)

FIRST PART: INTRODUCTION AND BACKGROUND

- I. History of Chemical Fertilizers (update X-81)
- II. World Outlook for Population, Food and Fertilizer Requirements
- III. Role of Fertilizers in Agriculture
- IV. General Concepts and Definitions
- V. Fertilizer Raw Materials and Reserves

SECOND PART: NITROGEN FERTILIZERS

- VI. Production of Ammonia
- VII. Transportation, Storage and Direct Use of Ammonia
- VIII. Production of Ammonia Salts, Nitric Acid and Nitrates, Sulphuric Acid, Hydrochloric Acid
- IX. Production of Urea
- X. Production of Nitrogen Solutions
- XI. Some Factors Influencing Choice of Nitrogen Fertilizers

THIRD PART: PHOSPHATIC FERTILIZERS

- XII. Phosphate Rock
- XIII. Production of Sulphuric Acid
- XIV. Phosphoric Acid
- XV. Phosphate Fertilizers Derived from Phosphoric Acid
- XVI. Nitrophosphates
- XVII. Other Phosphate Fertilisers
- XVIII. Some Factors Influencing Choice of Phosphate Fertilisers

FOURTH PART: POTASH AND OTHER FERTILIZERS

- XIX. Production of Potash Fertilizers
- XX. Production of Multinutrient Fertilizers
- XXI. Secondary and Micronutrients
- XXII. Controlled Release Fertilizers

FIFTH PART: PLANNING AND ECONOMICS OF FERTILIZER PRODUCTION

- XXIII. Pollution Control and other Environmental Factors
- XXIV. Some Important Physical and Chemical Properties of Fertilizers and Test Methods for their Determination
- XXV. Planning the Development of a Fertilizer Industry
- XXVI. Economics of Fertilizer Manufacture and Transportation
- XXVII. Issues Facing the World of Fertilizer Industry

ANNEX D

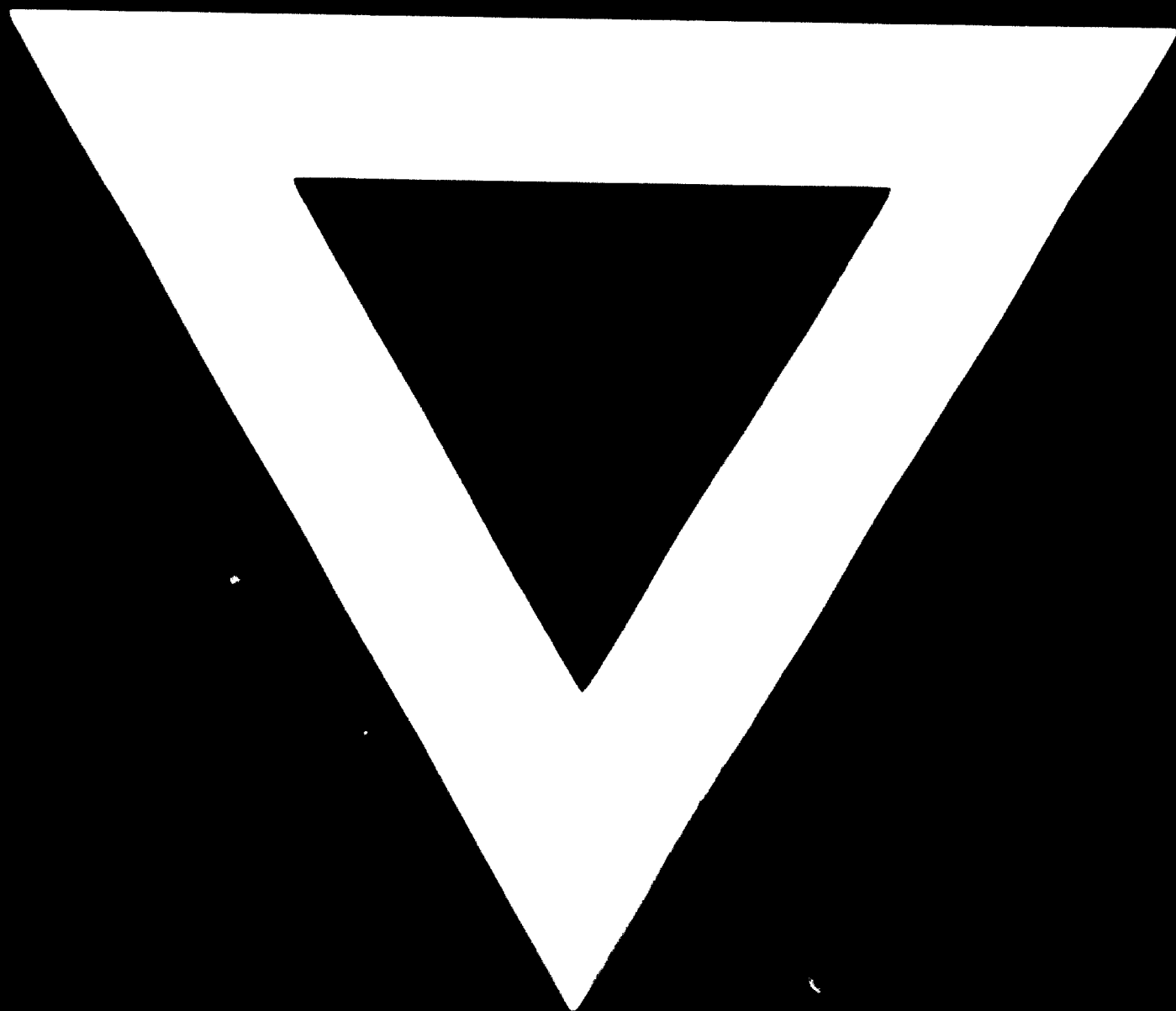
Preliminary Draft of
Guidelines for the use of UNIDO model forms of contract
for the construction of a fertilizer plant

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2. UNIDO'S APPROACH TO PREPARING THE MODEL FORMS OF CONTRACT
3. PREREQUISITES FOR USING EACH TYPE OF MODEL FORM OF CONTRACT
4. POINTS TO CONSIDER WHEN SELECTING THE PARTICULAR TYPE OF CONTRACT TO BE MADE
5. EVALUATION OF BIDS BY PURCHASER AND NEGOTIATIONS LEADING UP TO THE SIGNING OF THE CONTRACT
6. SOME MAJOR TECHNICAL POINTS THAT SHOULD BE COVERED BY THE CONTRACT
7. SOME MAJOR COMMERCIAL AND LEGAL POINTS THAT SHOULD BE COVERED BY THE CONTRACT
8. ROLE, FUNCTIONS AND LIABILITIES OF THE CONSULTING ENGINEER IN DRAWING UP AND SUPERVISING IMPLEMENTATION OF A CONTRACT
9. METHODS OF MANAGING THE CONSTRUCTION OF A FERTILIZER PLANT
10. TRAINING OF PERSONNEL TO OPERATE A FERTILIZER PLANT

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