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Report No. 11904

PROJECT COMPLETION REPORT

ZAMBIA

**FERTILIZER INDUSTRY RESTRUCTURING PROJECT
(CREDIT 1662-ZA)**

MAY 24, 1993

**Industry & Energy Operations Division
Southern Africa Department
Africa Regional Office**

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CURRENCY EQUIVALENTS

1 Million Zambia Kwacha (ZKW) = \$170,000 US\$ (January 1986, Appraisal)
1 Million Zambia Kwacha (ZKW) = \$ 17,000 US\$ (May 1991, Project Closure)
1 Million Zambia Kwacha (ZKW) = \$ 7,000 US\$ (April 1992)

ABBREVIATIONS

KfW - Kredinstalt fur Wiederaufbau
MT - Metric Tons
NCZ - Nitrogen Chemicals of Zambia Limited
OECF - Overseas Economic Cooperation Fund of Japan
OMF - Operations Management Firm
PCR - Project Completion Report
ZCF - Zambia Cooperative Federation

FISCAL YEAR

Government - January to December
NCZ - April to March

THE WORLD BANK
Washington, D.C. 20433
U.S.A.

Office of Director-General
Operations Evaluation

May 24, 1993

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

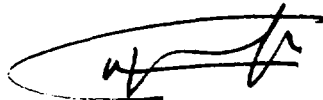
SUBJECT: **Project Completion Report on Zambia
Fertilizer Industry Restructuring Project (Credit 1662-ZA)**

Attached is a copy of the report entitled "Project Completion Report on Zambia - Fertilizer Industry Restructuring Project (Credit 1662-ZA)" prepared by the Africa Regional Office, with Part II contributed by the Borrower.

The objective of the project was to restore the technical integrity and the financial viability of Nitrogen Chemicals of Zambia (NCZ). This objective was not achieved. The scale of the effort required was underestimated. At completion, the plants were still not operating properly and the company was incurring heavy losses. The Bank contribution to the project was to finance technical assistance, training and rehabilitation of some plant facilities. Training, management and environmental/safety aspects were enhanced as a result of the project. However, the overall performance of the consultants hired to carry out this component was well below expectation. Two bilateral donor agencies also participated in the project, OECF from Japan and KfW from Germany. The scope of the works changed significantly when delays in the KfW financed component led to further deterioration of the plant. Since then, rehabilitation has been running behind requirements.

The project is rated as unsatisfactory and its sustainability as uncertain.

Although some data are missing, the PCR provides a frank and informative account of project outcomes. An audit is underway.

A handwritten signature in black ink, consisting of a large, stylized initial 'W' followed by several horizontal strokes and a vertical line, all enclosed within a thin, hand-drawn oval.

Attachment

PROJECT COMPLETION REPORTZAMBIAFERTILIZER INDUSTRY RESTRUCTURING PROJECT

(CREDIT 1662-ZA)

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PROJECT COMPLETION REPORT

ZAMBIA

FERTILIZER INDUSTRY RESTRUCTURING PROJECT
(CREDIT 1662-ZA)

PREFACE

This is the Project Completion Report for the Fertilizer Industry Restructuring Project in Zambia.

The Bank's financing consisted of a credit (Credit No. 1662-ZA) denominated in SDRs and equivalent at the time to US\$10 million which was signed on April 9, 1986 and became effective on September 25, 1986. The credit closing date, originally December 31, 1990, was extended subsequently to December 31, 1991. The accounts were closed with the credit being fully disbursed on May 10, 1991.

The PCR was prepared jointly by the Industry and Energy Division of the Europe, Middle East and North Africa Regions shared services and the Industry and Energy Division of the Southern Africa Department, Africa Region (Preface, Evaluation Summary, Part I and Part III and by the Borrower (Part II).

Preparation of this PCR was initiated during the Bank's final supervision mission of the project in August 1991 and is based, inter alia, on the Staff Appraisal Report and Report and Recommendation of the President, the Memorandum of Understanding and the Credit Agreements, Supervision Reports, correspondence between the Bank, the co-financiers, the Borrower and the chief beneficiary of the credit, internal Bank memoranda and data.

PROJECT COMPLETION REPORT

ZAMBIA

FERTILIZER INDUSTRY RESTRUCTURING PROJECT
(CREDIT 1662-ZA)

EVALUATION SUMMARY

1. Objectives. The key objective of the project was to assist the new Zambian development strategy introduced in 1983, whose most important elements were: the transformation of the agricultural sector into the leading source of economic growth; and the restructuring of the industrial sector to increase efficiency and exports.

2. The project was to restore the technical integrity and the financial viability of Nitrogen Chemicals of Zambia Ltd (NCZ) in order to ensure timely delivery of fertilizer to Zambian farmers and explosives to the mines at internationally competitive prices and at minimum foreign exchange outflow.

3. Implementation Experience. At the request of the Zambian Government, the Bank decided in January 1985 to participate in the project with two bilateral donor agencies - OECF of Japan and KfW of Germany. The latter would be responsible for the physical rehabilitation of the two main production lines at a total estimated cost of about US\$54 million. The Bank's contribution to the project was to finance technical assistance, training of NCZ's staff and rehabilitation of some off-battery facilities for a total estimated cost of US\$10 million.

4. The Japanese rehabilitation component for the NCZ I production line was completed in August 86, only one month behind schedule and within budget. However, the German component was very delayed. The turnkey contract for rehabilitation of the NCZ II production line only became effective in early 87 - one year later than the appraisal estimates. The suspension of disbursements to Zambia by the Bank in 87 and by KfW in 88 led to further delays. As a result, the German contract was completed only at the end of 89.

5. The implementation of the NCZ II plant rehabilitation was disappointing. Performance of all consulting groups was below expectation. The scope of works changed significantly when delays led to further deterioration of the plant. Plant rehabilitation could not be completed without additional financing of an unknown magnitude. Due to the donors' reluctance to close the large but undefined financing gap, the work was terminated when the funds were used up. Efforts were made by NCZ to reduce the scope of works and thereby the funds required to get the NCZ II plant "up and running". But the rehabilitation remained incomplete right up to the Credit Closing in December 1991.

6. As a result, NCZ fertilizer production has not even reached 50% of the appraisal estimate. This has caused severe financial problems, which have been exacerbated by unexpectedly high production costs, customers who have defaulted on payments and the inability of the government to pay fertilizer subsidies brought on by earlier price controls.

7. Project Results. The project did not meet its key objective of increasing the domestic supply of fertilizer. Less than 20% of the country's fertilizer needs are supplied from the high cost NCZ operation. The rest of the supply is still imported in various forms from ammonia to finished products. It is difficult to assess whether the ongoing efforts to complete the NCZ II plant and bring it on-stream will succeed. Indications are that if the fertilizer complex can operate at typical capacity, it will be financially and economically viable - on the basis that the costs incurred at the date of this report are treated as a sunk cost. It is therefore worthwhile for NCZ to continue its efforts to complete the rehabilitation, provided that this can be achieved at a reasonable cost.

8. Project Sustainability. The NCZ operation is not sustainable until the plant rehabilitation is complete. Sustainability can only be attained when sufficient operating profits are generated to pay for the necessary investments in preventive maintenance, overhauls and replacements. The following steps are needed: (1) Financially restructure NCZ to regain a strong balance sheet. The main requirement will be for the present government to fulfill the obligations of the previous government to pay off the inordinately high accounts receivable; (2) complete the rehabilitation of NCZ II; (3) elevate plant capacity utilization to the levels foreseen at appraisal; (4) ensure availability of foreign exchange for plant operation and maintenance and import of raw materials; and, (5) ensure a reliable supply of good quality coal. With effort, these steps can be achieved.

9. Findings and Lessons Learned. Overall, the project failed to meet its major objectives. It did little to establish a reliable and cost effective supply of fertilizers to the Zambian farmers. The successful outcome of the project pivoted around the total technical rehabilitation of the plant. When this failed, the TA, training and other software inputs also lost most of their impact.

10. The two most important lessons learned are: Firstly, rehabilitation of technically complex installations requires large financing contingencies, and one donor to be recognized as leader and to have the authority and influence to achieve results. In this project, the Bank was a minor lender and could not persuade the lead donor to see the project through to completion. Secondly, putting price as a major factor in the evaluation of consulting contracts leads the winning consultant to economize on the quality of staff. In turn, this leads to performance not meeting expectations.

PROJECT COMPLETION REPORT

ZAMBIA

FERTILIZER INDUSTRY RESTRUCTURING PROJECT (CREDIT 1662-ZA)

PART I. PROJECT REVIEW FROM BANK'S PERSPECTIVE

A. Project Identity

Project Name : Fertilizer Industry Restructuring Project
Credit No. : 1662-ZA
RVP Unit : Africa Regional Office
Country : Zambia
Sector : Industry

B. Background

1.01 In 1983 the government asked the Bank to assist in the rehabilitation of the fertilizer and explosives manufacturing plants located in Kafue and owned and operated by the state company Nitrogen Chemicals of Zambia Ltd (NCZ). The first plant (NCZ I), delivered and installed by a Japanese contractor and financed by a bilateral loan from the Overseas Economic Cooperation Fund (OECF) of Japan, was commissioned in 1970. In order to expand and diversify production capacity of NCZ to meet a larger part of the country's fertilizer requirements, the construction of a second production line (NCZ II) was started in 1975 with a consortium of West German and French contractors responsible for the whole of the works except utilities and infrastructures and financed by commercial loans. Following several delays and cost overruns this plant went on stream in 1982.

1.02 In 1983 plant utilization was still below 35%. NCZ faced financial problems caused by the low capacity utilization, high production costs due to inefficient operations, and a heavy debt burden resulting from implementation of the NCZ II plant. Studies indicated economic merit in undertaking the full rehabilitation of both plants, and both OECF and KfW offered financial support. The government, therefore, changed its request and asked the Bank to participate in the full rehabilitation of both plants including training and measures to improve management, organization, operation and maintenance of NCZ.

1.03 The proposed project would help meet the two important new strategic goals. First, it would improve the supply of an essential input for increasing crop production at prices comparable with imports. Therefore it supported the transformation of agriculture into a leading agent of economic growth, a development the Bank encouraged strongly. Second, it would rehabilitate an important industrial enterprise within the framework of the new industrial strategy, also strongly encouraged and supported by the Bank.

C. Project Objectives and Description

1.04 Objectives. The main objective was to assist the government to physically rehabilitate the NCZ facilities and improve its management and corporate performance.

1.05 The specific objectives of the Credit were to assist in: restructuring NCZ's management, organization, staffing and finances; introducing modern management techniques for plant operation and maintenance; upgrading the skills of the NCZ staff; ensuring an integrated and efficient technical rehabilitation of NCZ's physical facilities; and, improving the raw material acquisition and final product off-take logistics system.

1.06 Project Description. The project consisted of two major components, namely: Policy and Institutional Improvement Component consisting of provision of operating management services, staff training, and technical coordination services for the physical rehabilitation of the NCZ plant. Physical Support and Financing consisting of technical rehabilitation of the NCZ I and II plants, off-sites, infrastructure and environmental facilities.

1.07 Project Costs and Financing. Project costs were estimated at US\$ 69.25 million, of which the IDA credit was to finance US\$10 million. (corresponding to about 12% of the overall financing required), an OECF loan US\$26.28 million, a KFW loan US\$27.2 million, and NCZ the remaining US\$5.37 million.

D. Project Design and Organization

1.08 In retrospect it is evident that the design of the overall package, and of the Bank-supported components, were inappropriate. The idea was to integrate all project components into a single rehabilitation project under the Bank's overall control and supervision. The Japanese and German bilateral components were strictly kept within the battery limits of each plant while the TA component financed by the Bank ensured their coordination. Environmental and safety aspects were included in the TA component. Further, the Bank supported the rehabilitation of utilities and off-sites not covered by the two bilateral aid components.

1.09 A Bank financed operations management firm (OMF) was to restructure and streamline NCZ's organization and management and train its staff. The credit and project agreements were designed to support and maintain the desired changes and improvements in NCZ performance and to provide the Bank with proper means for surveying the process.

1.10 NCZ had the primary responsibility for project management and implementation. It entered into turnkey agreements with the same contractors that originally had been responsible for plant design and installation - Kobe Steel of Japan and Klockner of Germany. Each rehabilitation project was monitored by a technical advisor appointed by the respective bilateral financing agency. Overall technical coordination and supervision of the total work, including improvement of the off-sites, utilities and environmental systems was performed by a technical coordinator provided by the OMF. The OMF

was also responsible for plant operation and management, training of NCZ staff, and development and introduction of new financial and management information systems, and suitable procedures for production optimization and cost control. A Project Steering Committee (PSC) was established by NCZ, its parent - Zimco - and Ministry of Finance to facilitate processing of policy and finance related measures.

1.11 All these arrangements should have ensured a major improvement of the management and corporate performance of NCZ, and the successful completion of the project. As explained below, things did not turn out as well as expected and the project is still not complete.

E. Project Implementation

1.12 Implementation of the project has not been satisfactory. Only part of the objectives were met and the hoped-for positive impact on agriculture has been very limited. A general cause is that most of the parties to the project under-estimated the scale of effort required. There was also not a strong commitment to the project on the part of the government, especially with regard to foreign exchange allocations and setting of NCZ ex factory prices. The suspension of credit and aid disbursements to Zambia by the main donor agencies contributed significantly to the poor project outcome.

1.13 Project Preparation and Credit Effectiveness. The project was identified in August 1983 but the Credit only became effective on September 1986. It took more than one year of concerted effort by Bank staff to reach a first decision not to participate in the project. When this decision was subsequently reversed as a result of reevaluation of project risks and viability, it took another year for Board approval.

1.14 Strong measures had to be devised to reduce these risks to a manageable level. The efforts centered on integrating the various components into a single rehabilitation project, and persuading the government, Zimco and NCZ to completely restructure the firm. These activities directly related to NCZ were fairly successful albeit with some delay. But the efforts to coordinate the Japanese and German inputs met with only limited success. In spite of the Bank's recommendations that the NCZ I and NCZ II plants should function in tandem to achieve maximum operational efficiency the Japanese and West German companies proceeded with their technical design without mutual consultation and coordination.

1.15 The only real results of the Bank's technical coordination effort was the inclusion of a pollution reduction element in both projects. The bank had been keen for the adoption of a set of performance guarantees in the German contract, but these were negated when the plant was not completed. The modest outcome was partly due to late intervention by the Bank and reluctance by the bilateral agencies to support the modifications in the contracts suggested by the Bank.

1.16 Implementation Schedule. The physical rehabilitation component was originally scheduled for completion in December 1987. The provision of services by the OMF was to end in December 1989. With the delay of Credit

effectiveness to September 1986 things got out of sequence as the rehabilitation of the NCZ I plant had already been completed by August 1986, only one month behind schedule.

1.17 The scope of rehabilitation of the NCZ II plant proposed by the German contractor was reviewed and updated by NCZ in February 1986 and the turn-key contract was signed in June 1986. However, there were difficulties in fulfilling cross effectiveness conditions between the WB Credit and the KFW loan and the Klockner contract was delayed almost a year. Expected completion was revised to March 1989 instead of December 1987 as originally anticipated. The suspension of loan and credit disbursements to Zambia by the Bank in May 1987 and by KFW in March 1988 led to further delays in the NCZ II plant rehabilitation.

1.18 To make things worse it had become evident that the stage of deterioration of the NCZ II plant was much more advanced than anticipated. Additional rehabilitation would be outside the Klockner contract. The rehabilitation could not be completed within the rehabilitation budget and would require major additional financing. The Klockner contract was terminated uncompleted at the end of 1989.

1.19 No donor assistance could be found to complete the work due to lack of confidence in NCZ's capability to ensure project viability, and continued problems with aid disbursements to Zambia. Continued rehabilitation of the NCZ II plant was therefore done on basis of funding that could be provided by NCZ itself, with support from Zimco and the government. Due to the scarcity of these funds, the remaining rehabilitation work was divided into two stages: Phase IIA intended to get the NCZ II plant "up and running" and phase IIB to get the NCZ II plant up to higher performance. At the Credit closing date the phase IIA works were not yet completed and the NCZ II plant had not become operational.

1.20 In 1989 the OMF contract closing date was extended in stages for 15 months to extend the provision of OMF services to cover the delay in plant rehabilitation.

1.21 Credit Suspension. Due to Zambia's failure to service its bank loans and credits the Bank and IDA suspended disbursements to the country with effect from May 1, 1987, except for disbursement on ongoing consultancy contracts and some overseas training. The suspension was not lifted until mid-1989. The suspension prevented the purchase of spare parts and materials needed for plant maintenance and rehabilitation. The result was further plant deterioration and delays.

1.22 Project Costs. The estimated cost of the project at appraisal was about US\$69.3 million. At the time of this PCR, NCZ estimated the total cost of completing phases IIA and IIB of the NCZ II rehabilitation and showed that the total project cost for the whole rehabilitation project was of the order of US\$108 million for foreign costs and ZKW 770 million for local costs. The 70 % increase in the foreign costs is mainly due to the increase in rehabilitation works for the NCZ II plant that was seriously under-estimated at the start of the project.

1.23 Disbursements. At appraisal it was projected that the credit would be fully disbursed by December 1990. However, the penultimate disbursement was made in March 1991, when a large amount of approximately US\$2.3 million was used to retroactively finance some purchases of spare parts. This became part of the foreign exchange supply to the country and so assisted in the macro-financial restructuring. In May 1991, the final disbursement of US\$14,000 was made.

1.24 Risk Identification. Early in the process the Bank recognized that it would face many risks in the rehabilitation of a marginal, small size fertilizer plant. The risks were correctly identified: projected increases in world fertilizer prices would not materialize; delays in project implementation; capital costs higher than expected; and, lower than anticipated capacity utilization levels (NCZ I 80%, NCZ II 75%) due to poor management, technical problems, and the lack of foreign exchange. The project design attempted to accommodate these risks (part 4). Project implementation indicates that the Bank's first evaluation that these risks were too high to allow it to participate was correct. It was exactly the underestimate of the scope of the work which led to higher than expected capital costs.

1.25 Safety and Environment. The rehabilitation included plant modifications to reduce NOx emissions to an acceptable level. Comprehensive environmental and safety studies were carried out by the OMF and the Bank during implementation. They have been constructively acted upon by NCZ.

F. Project Results

1.26 Project Objectives. The project did not meet its chief objective of improving domestic production of fertilizers for development of Zambia's agriculture at minimum foreign exchange outflow. Despite the immense investments and efforts by the government and NCZ, the plants are still not operating properly. The resources needed to complete the project must be considered carefully. On the one hand, they are a drain on the energy and finances of the country, but on the other, the return on the incremental investment to get the NCZ II plant "up and running" is very attractive.

1.27 Physical Results. The rehabilitation of the NCZ I plant was completed almost on schedule. In spite of the scope of work done by the contractor being increased during implementation, the additional costs were within the contingency of the OEFC loan.

1.28 At the time of this PCR, the NCZ II plant had not been fully rehabilitated or brought into operation. NCZ is still short of a few million dollars to do the additional work identified during the execution of the Klockner turnkey contract.

1.29 Strengthening of NCZ Management and Organization. The Policy and Institutional Improvement Component which constituted the Bank's main direct input has been fairly successful in spite of the shortfalls in the OMF performance. The component was implemented partly by the Bank itself during project preparation and partly by the OMF.

1.30 The plant operation and rehabilitation projects are now managed completely by the Zambian personnel, following the termination of the OMF contract and the withdrawal of the expatriate contractors. The senior and operating managers are showing much initiative in relation to both completing the project and improving operations. In this sense, the efforts of the Bank and the OMF have been successful.

1.31 Financial Performance. At the Credit closing date NCZ was again in dire need of financial restructuring. It had not been in compliance with the financial covenants for 2 years. Because NCZ has been unable to submit recent audited accounts detailed scrutiny of the company's financial status at closing is not possible. There is little doubt that the actual NCZ financial performance is not comparable with the appraisal estimates since the company has been operated with heavy losses the last 3-4 years.

1.32 Project Impact. The project's training component has undoubtedly had a positive impact on the capability and performance of the NCZ management and staff. Today they represent a vast resource of fertilizer and process industry expertise - a sound asset for the country. The environmental effects of the fertilizer production in Kafue have been reduced to an acceptable level and the safety aspects of plant operation have been significantly improved. Further, the project has had a positive impact on the fertilizer pricing policies and it has led to improved autonomy of one of the major parastatals, as a possible step towards future privatization.

G. Project Sustainability

1.33 The present low capacity utilization makes the NCZ operation unsustainable today. NCZ needs to function at a level where the generation of operational profit will allow it to invest enough in preventative maintenance to sustain operations. Sustainable operation requires the Kobe and the Klockner plants to operate at a high capacity utilization level. This requires the presently inactive NCZ II plant to be brought on-stream. The estimated cost of completing Phase IIA to get the plant "up and running" has been reduced by NCZ to about US\$4 million from the originally estimated US\$15-20 million. Some US\$1.3 million was obtained from Zimco and the balance is being sought from commercial banks as NCZ improves its financial standing. Part of the funds for Phase IIB have been obtained in the form of a US\$8 million grant from the Italian Government.

1.34 NCZ is financially devastated and has been so since it was asked by the government to take over the fertilizer marketing and distribution activities of Namboard and ZCF more than 2 years ago. It did so but was not given enough working capital, nor has it been paid fully for past sales. The government directed NCZ to supply fertilizer to customers reluctant or unable to pay for it and has not acknowledged its liability to recompense, nor has it paid NCZ the subsidy element for the period when prices were controlled.

1.35 The company needs a capital injection of some KW 4.5 billion to get it back on a sound financial footing. A major financial restructuring of NCZ will thus be required to improve the company's credit rating if it is to obtaining commercial funding for rehabilitation purposes.

H. Bank Performance

1.36 The Bank made major efforts to minimize and control the many risks associated with the project. Project preparation and implementation were closely controlled and monitored. There were detailed identification, pre-appraisal, appraisal and two post-appraisal missions. During the 63 months between the credit effectiveness and closing, there were 14 formal - and many more informal - supervision missions, including two major project reviews (schedule B, section 8, part III).

1.37 The Bank's performance, including the technical staffing of the various missions, can generally be described as satisfactory.

1.38 The financial contribution of the Bank was only 12% of the total funding, but yet the Bank took on the responsibility for the integration of the project components into one single rehabilitation project and for the coordinating, optimizing and integrating the two bilateral components. This was a major undertaking which in the end failed to achieve its goals.

1.39 Though the Bank generally made a positive contribution to the intended improvement of NCZ's technical integrity and economic and financial viability, in retrospect, the following lessons may be learnt from the experience in the Project:

- (a) The immense investment in the NCZ plant in Kafue is still non-performing. Huge resources are required to bring the plant on stream in a sustainable manner. It therefore seems fairly obvious that the Bank should have stuck to its original decision not to participate. Instead, it should have helped Zambia develop an efficient nationwide fertilizer import and distribution system to ensure timely availability of fertilizers at a reasonable price.
- (b) Due to the suspension of disbursements the provision of the OMF-component became the Bank's sole direct contribution to the project. The Bank ought therefore to have reacted more promptly to the shortcomings and falling performance of the OMF.
- (c) The placing of expatriate consultants in line management functions was a very delicate matter that did not turn out well. More attention should have been given to this aspect of the OMF-NCZ agreement. There should have been more critical scrutinizing of the professional and personal profiles of the appointed candidates.
- (d) Stronger technical coordination of the Bank financed components and those of the bilateral agencies was needed. The required characteristics of the Bank and bilateral components need to be sufficiently defined so that all the donors are acting together.
- (e) The rehabilitation of complex technical installations requires the inclusion of very generously sized contingencies in the financing plan.

- (f) When the major donor chose to decide against the Bank's recommendations not to complete the project this inevitably led to physical failure of the project. An important lesson is the risk accepted by the Bank when relying on other donors in complex projects, and the potential for better success if a donor takes total responsibility for providing external assistance for a project.
- (g) The blame for the project failure is a contentious issue. The bilateral agency blames Government, NCZ and the OMF. It also blames the Bank for inadequate efforts in supervising coordination of rehabilitation. The Bank never accepted responsibility for more than provision of one individual as coordinator. Eventually, though, the Bank took steps when the suspension situation permitted and when it became evident that no other donor would fill the gap to add to this effort through refocussing the role of the OMF. The style and tone of bilateral communications did not help to promote a supportive donor relationship.

I. Borrower Performance

1.40 Government compliance with the covenants has generally been unsatisfactory especially the provision of the necessary financial support to NCZ during project implementation. To a significant extent the government has been instrumental in getting NCZ into its present serious financial jeopardy.

1.41 The technical management provided by NCZ during project implementation can be considered satisfactory except for the lack of effort in the maintenance and preservation of equipment and materials during the long periods without rehabilitation activities. There is some excuse for this in the lack of foreign exchange to obtain needed supplies, and the unclear split of responsibilities between the OMF and NCZ.

1.42 The financial performance of NCZ has not been satisfactory. NCZ is out of compliance with the covenants concerning the submittal of audited accounts for FY 90/91, which has not been received by the Bank.

1.43 In retrospect, the main lessons that can be learned by the borrower and the beneficiary from the project experience are:

- (a) The rehabilitation of technically complex installations cannot proceed without proper financing, including adequate provisions for contingencies.
- (b) It is vital to establish proper responsibilities, performance criteria and baseline when employing an OMF.

J. Bank/Borrower Relationship

1.44 The Bank's relationship with the government, NCZ and the co-financiers OECF and KFW has generally been good. Due to the disjointed timing

of the Japanese input the actual cooperation between the Bank and OECF was rather limited. In the case of KFW it was fairly close and included coordinated pre-appraisal and appraisal, common project reviews and cross effectiveness between the IDA credit and the KFW loans. The cooperation between KFW and the Bank ended suddenly in 1990 after both had monitored nearly 12 months of detailed negotiations between Klockner and NCZ concerning the execution of Phases IIA and IIB. While the Bank felt that the project should be brought to 'up and running', at that point, the German government withdrew its support when it saw little chance of conditions being fulfilled that it had set on project viability and management. This led to a decision by the Norwegian Government not to finance a management contract between Norsk Hydro and NCZ that likewise had been negotiated for months.

K. Consulting Services

1.45 Two groups of consultants were employed to help execute the project - an Italian company and a German firm. The Italian firm was selected as the OMF under IDA rules from five international consulting groups. The German firm was selected under KfW rules from a list of German consultants to supervise Klockner's work. Neither seems to have performed with full satisfaction. Both were the subject of many complaints by NCZ management during project implementation.

1.46 The Italian firm was selected by NCZ and approved by the Bank as OMF and provider of the technical coordinator. It won the bidding over a Norwegian company, when commercial evaluation of the two bids, necessitated by an apparently very narrow difference between the technical bids, showed that the Italian offer was approximately 40% lower than the Norwegian one. This was mainly due to lower Italian manmonth rates. By international standards, the Italian firm's salaries were also quite low. This may have been the cause of complaints by NCZ about the quality of Italian personnel. Some were said to be less highly qualified than the Zambians they displaced, others to lack fluency in English and many not to possess deep experience or knowledge about parts of the technology of the NCZ plants.

1.47 An evaluation of the performance of the OMF in December 1989 indicated severe shortcomings with regard to plant maintenance, performance of studies, issuing of progress reports, training of Zambian counterparts and introduction of improved operating systems. Poor relations existed between NCZ and OMF management and staff. However, taking note of the limited choices caused by the suspension, the significant Italian grant money that had been promised and based on a reform program for the OMF, the Bank agreed that the Italian contract could be extended for 15 months to March 31, 1991 to cover a crucial period of project financing negotiations.

1.48 The selection of the German consultant to control the performance of Klockner - both German and both financed by KFW - created some problems during implementation since NCZ believed (rightly or wrongly) that the consultant was "too close" to the contractor.

L. Project Documentation and Data

1.49 The Development Credit Agreement and the Project Agreement have both been found quite adequately designed for achieving the intended project objectives with regard to key operational, organizational and financial areas.

1.50 The Project Appraisal Report was very comprehensive and provided an appropriate framework for reviews, supervision missions and for the present PCR. However, a clearer definition of indicators for project implementation and project achievements and their corresponding baseline as well as the inclusion in the Agreements of the requirement for submittal of data for such indicators would have been most useful in connection with project evaluation.

1.51 Generally the project files were readily available and very comprehensive but only a few of NCZ's audited accounts could be identified in the files. There were holdups in the auditing of the accounts caused by NCZ's financial problems, but by the time of the PCR, all the accounts except those for 1990/91 had been released. The Bank's database was not able to provide any useful Audit Covenant Reporting for this PCR.

PROJECT COMPLETION REPORT

ZAMBIA

FERTILIZER INDUSTRY RESTRUCTURING PROJECT
(CREDIT 1662-ZA)

PART II. PROJECT REVIEW FROM BORROWER'S PERSPECTIVE



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Ref: NCZ/GM/IML/jlk

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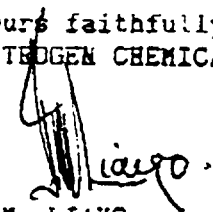
The World Bank
1818 E. Street
Washington DC
20433 USA

Dear Sir

RE: PROJECT COMPLETION REPORT ON CREDIT 1662-ZA

Herewith please receive our review for Part II of the captioned project as the amendments to the relevant pages as regards Part I and Part III.

Yours faithfully
NITROGEN CHEMICALS OF ZAMBIA LIMITED


I. M. LIAYO
GENERAL MANAGER

cc Mr J. Innes World Bank Representative Lusaka
Managing Director - NCZ

SUMMATION

It is extremely regrettable and unfortunate that this part of the Project Completion Report i.e. a retrospective assessment and analysis of the performance on the key issues relating to the project, has to be done when major areas like completion of rehabilitation, completion of intended trainings, completion of the in-house computerised data management systems etc etc are NOT YET COMPLETE.

While due cognisance for certain shortcomings outside the scope and control of the performance under this report must be given such as (a) non-compliance on the guarantee by BOZ to release yearly \$5 Million for maintenance spares, water treatment chemicals and catalysts (b) delay and set-back in the rehabilitation of the Klockner line due to freezing of funds assured by the co-financier caused by delayed compliance by GRZ to give economic prices to NCZ's products etc etc., all which put up a strain on the performance of the OMS, it must also be recognised that the OMS got a sympathetic consideration from GRZ, ZIMCO and the Bank itself in granting necessary time extensions and re-allocations of funds utilisation and in fact towards the later half of the project some exceptional assistance from new co-financiers especially EEC.

Therefore, a very candid, frank and totally unbiased assessment has been made by involving the entire management team of NCZ that has resulted in this synopsis. Categorical statements made herein can be substantiated by records and evidence of responsible staff at NCZ. While due credit must be given for Zambianisation and the consequent exposure of Zambian Managers to senior and top head of the department level responsibilities one cannot omit the saddening and disheartening facts like (a) poor quality experts and specialists being involved (b) muzzling down of bonafide and purposeful criticisms by beneficiary's employees that were contrary to the OMS views (c) not involving the senior Zambian personnel in the periodic or annual project progress reckoning discussions which could have contributed substantially in constructive course corrections and could have made the project financing more useful.

PROJECT COMPLETION REPORT

PART II

This report constitutes the beneficiary's analysis and evaluation of the project for purposes of both the statutory requirement and the learning objective of the World Bank which are set out in detail as here-in-under.

A) MANDATED TASKS

Obviously project completion is not just the exhaustion of the funds allotted for it or the lapsing of the time frame allotted for it. It is equally achieving the targets set or completing the mandated task originally intended.

The mandated tasks envisaged originally for the OMS (Overseas Management Service) company were:-

- 1) Technical co-ordination of the rehabilitation of both the Kobe line and the Klockner Line, together with any other component mutually agreed as required for the rehabilitation project;
- 2) Management and assistance in the operations of the plant during and after completion of the rehabilitation;
- 3) Install a suitable in-house computer system to meet all managerial data processing needs and train NCZ personnel in manning and improving the same to meet the growing future needs of the company;
- 4) Development and implementation of proper organizational restructuring of NCZ to sustain continued viable operations;
- 5) Training of NCZ Zambian personnel for the same;
- 6) Preparation and submission of various studies set-forth in Appendix A i.e.,
 - i) Environmental studies of solid and liquid effluent disposal systems;
 - ii) Energy audit study;
 - iii) Study of safety procedures;

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The detailed description at Appendix A specify that each study should determine current and future impact of the study subject and propose adequate recommendations to adhere to strict international standards and after approval by NCZ to supervise their implementations.

The mandated tasks were to last from October 1985 to December 1989 and cost a total of 423 man months of assorted grades but during the tenure was extended vide Side Letter I dated 27th March, 1989. The emphasis of this Side Letter which was duly approved by World Bank was:-

- 1) To enhance the validity of OMS manmonths to 682;
- 2) To enhance correspondingly the fees and charges payable to OMS home office, living allowance, travel and contingency costs and;
- 3) To enhance the personnel to support the Technical Co-ordinator of the rehabilitation by Seven (7) more.

Later by a further Side letter II dated 29th November, 1989, the tenure of the project was extended by a period of 12 months so as to last up to 31st December 1990 and the OMS's responsibility towards organizational restructuring was curtailed so as to remove the responsibility of management by OMS personnel who were to appoint and train the Zambian counterparts by making OMS personnel as counterparts in an advisory and consultant capacity with the Zambian managers' becoming responsible for running the plant.

Finally vide agreement dated 19th November 1990, the period of OMS involvement under World Bank project was extended by a further 3 months but contingent upon the OMS company obtaining before expiry of such extended period. The Italian grant of 11.65 ITL approved for the revised scope of the feasibility study proposal that was already submitted through NCDP GRZ to the Italian Government.

It was therefore, clear from the above that the projects mandated tasks had often been changed and had been watered down considerably initially because of freezing of the funds from the co-financiers KfW and the non-implementation of certain GRZ conditions envisaged under the original project proposal and then later on amended again due to weaknesses shortcoming and failures in the OMS company's actual performance against targeted goals.

B) CONTINUITY OF PERSONNEL INVOLVED

It must be born in mind that the consistency and continuity of performances by all the parties was hampered by quite a few changes in the actual personnel assigned for the jobs. Numerous changes in

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OMS personnel have already been detailed with World Bank. There were three (3) changes in the Managing Director of NCZ who is the sole and prime operating officer of the beneficiary recognized under the contract. Even on the financiers' side the initial stages of controlling and directing the mandated tasks was vested with an official whose sympathetic consideration for the OMS was unduly high. Efforts are now being done to assimilate all the departmental comments on the various facets of OMS performance.

C) TECHNICAL CO-ORDINATION OF REHABILITATION

The zero date for the rehabilitation of the Kobe Line financed by the Japanese co-financier OECF had already commenced and the technical specifications, procurements of plant and equipment etc had progressed considerably before the World project came into effect. The procurement costs had been kept within the Japanese Grant's value limits and sufficient contingency funds were available when the OMS technical co-ordinating personnel under the World Bank funding came on site just in time for the shutdown of the Kobe plant lines and could supervise the shutdown, erection, commissioning and startup of the Kobe line right on schedule. But the co-ordination of this Kobe rehabilitation and dovetailing the same with the Klockner line rehabilitation programme started getting rough weather from the very word "go". Apparently, this prime task which should have been completed by November 1988 as per the original project so as to have 14 months of post rehabilitation operations under OMS supervision is yet to be completed despite the project time that has been suitably extended. Thus in essence, the project is not complete. The reasons for this delay are varying and not all of it attributable to OMS. Those that could be attributed to OMS' are:

Defective technical expertise and defective sequence and execution of jobs e.g costly superfluous replacement of vessels like the drop Separator in Gasification and unnecessary draining of available resources on Air Conditioning of Control Rooms at great expenses while totally ignoring water draining and dust sealing of sub stations which are totally damaging and detrimental for efficient post rehabilitated operations.

Defective technology i.e, even with prior experience of blockages and leakages due to corrosion in the Asponia Rectisol heat exchangers within two years of actual performance, the project co-ordination envisaged only one filter upstream of only one heat exchanger without really analysing the solution of the problem of blockage and leakages. The cause of the problem was something else i.e, NOX abatement which was well established before the zero date itself, this one filter upstream on one heat exchanger only was not

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a solution at all. Examination and replacement of the already damaged heat exchanger was not covered under Phase I of the project but was put under the beneficiary's scope. Further the technical survey did not address the eminent failures of Air Separator plants whose average life span should have been circa 12 years under normal working conditions. Also there was no necessity to install a new design of the Oxygen Evaporator which was not being used anyway.

Management of available contingency finances. The OMS appeared to have been over-lax in approving contracts variations and a lot of variations which did not have a direct bearing on the project had exhausted all the planned contingency even before the erection commenced. The scope did not emphasize or zero on the major bottleneck areas and the project administration apparently lacked proper perception in the allocation and utilization of available resources.

Defective procurement. It is apparent that in a number of cases, the relationship between what was required and what was procured were totally unrelated. Certain items were bought when the plant on which they were to be installed had already been modified or scrapped (debagging machines, wooden conveyor); two large fans, complete missing the motors only were bought as spares when the plant had only one such fan in use. The two fans are still in stores and what would have been a useful procurement would have been the bearings and small components requiring to be replaced within 2 years of operations but not the whole fan itself. The fans would probably not be needed for another 8 to 10 years.

In another case 6 fans were bought to replace existing 2 with an average life performance of 5 years at least. Another classic case is that of OMS procurement of 80 drive pulley sets all of the same gearing ratio when in the factory there are only 8 such pulley sets with a life period of over 10 years average. Infact the whole factory has only 40 pulley sets of varying gearing ratios.

Organization of NCZ scope was to say the least most haphazard and uncoordinated. Engineers and Technicians of Zambian origin were first ignored and lots of technicians totally strange to the jobs were imported at very heavy manhours cost but whose reports on NCZ

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scope of work had to be scrapped. Later on enlightenment dawned and Zambian Engineers, Process Supervisors Technicians were involved in finalizing the now enlarged NCZ scope but many of them were misdirected under technical co-ordinator of the rehabilitation and the morale dropped significantly and staff turnover of experienced staff was exceptionally high.

D) MANAGEMENT AND ASSISTANCE IN PLANT OPERATIONS DURING AND AFTER REHABILITATION

With this responsibility being at least partly unaccomplishable since the prime responsibility of rehabilitation is yet to be completed, it is also apparent that various side letters and amendments dissolved and diluted considerably the original responsibility of plants operational management and upon stream lining of procedures and operation manuals for Zambians to take over completion of the project. However this being a cardinal area with regard to the contribution of OMS as well as an expansive area for scope to contribute in this regard, the views of various Heads of Departments have been culled into some positive achievements or the pro-points and some negative aspects on the con-points. The pros-points can be summarised as:-

- 1) Contrary to the management before the advent of OMS when the Zambian middle and senior managers were "not encouraged" to learn and get acquainted with the plant operations and management, the OMS brought with them a different concept in which they removed as many Indian expatriates as possible and Zambianised their positions quite fast and expeditiously. However, they had wrongly assumed that the Zambians knew nothing and the role of OMS company were to show them how to operate the plant, preferably the Italian way even though the circumstances and environment in Zambia were quite different from those in Italy.
- 2) OMS also broadened managerial cadres, by scrapping of the "Assistants" positions and by segregating plants into smaller manageable units for which supervisors were appointed who reported directly to the head of department.
- 3) The appointment of Junior officers for day to day operations thus concentrating on manufacturing and maintenance operations with a small skeleton of personnel under Planning.
- 4) The Laboratory was made independent of Production with a separate head of department reporting to the General Manager/Works Manager which not only relieved the Production Manager of the strain but also constituted effective policing and control of products including waste products and effluents.

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- 5) The philosophy before their advent was that both production and maintenance were equally responsible for the plant and equipment. But they brought in a philosophy that the plants and equipment belong to the production staff who live with the equipment. This change in philosophy increased the production department's dedication to routine plant maintenance.
- 6) Other production cost savings were envisaged by use of Limestone instead of unslaked Lime; using synthetic Gypsum as filler for NPK were also welcome concepts.

However, there were substantial negative aspects attached with each pros point:-

- i) When contrary to the earlier assumptions they discovered that Zaibian staff were not as ignorant as originally thought severe serious iron fisted intimidation and booting out some who were too clever for them were practised. Job security meant total agreement with the OMS staff.
- ii) The specialists who came from OMS for management assistance were by and large ignorant of the processing techniques of the plant they were supposed to manage. The "expert" for gasification had never seen a gasifier and the Ammonia plant "Specialist" even complained that he had never heard or seen a rectisol system operated. Various other "experts" in NPK and Maintenance were no more than "glorified Technicians" and the amount of knowledge transferred to NCZ technicians were negligible and not worth the money spent on these experts manmonth costs.
- iii) The OMS company had no programmes for Middle and Senior level management and the mandate for training with OMS associated companies was never actioned.
- iv) The centralization of planning activities had caused serious emergency breakdown because of the relative alienation of the planning section from the shopfloor level. Thus instead of planned programmes taking shape, the performance under OMS management was more of constant fire fighting.
- v) While creating a separate department called transport department superfluously reduced pressure of purchasing department as well as production department who were herein before responsible for actual movements clearing

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and physical receipt, spares, bulk raw materials etc. The employees recruited and specialist assigned to these departments were absolutely raw and there was more chaos than order compared to herein before.

- vi) OMS failed miserably in detailing and implementing preventive maintenance and therefore efforts to reduce production costs and increase plant operational times gave apparent spurts of production but had severe damage inflicted onto the plant. This was further accentuated in the absence of guaranteed foreign exchange for buying preventive maintenance spares.
- vii) House keeping in NCZ which was already in bad shape was made worse during OMS management period with house cleaning efforts reserved for important visitors to the factory. Computerisation of stores has still remained a pipe dream and with the added confusion prevailing during OMS management regime locating emergency spares items was a nightmare.
- viii) NCZ's past records of effluent handling was characterized by outletting Nitrates in the liquid outlet courses into the Kafue River and disposing boiler ash and solid waste in specific places outside the factory but OMS committed worse murders by pouring liquid acidic waste from Sulphuric Acid Plant (when the slurry effluent pumps failed) into the Kafue river. Calcine dust was allowed to accumulate in undesignated areas. The gaseous emissions from NPK and SAP did severe damage to Zesco power station.

In the final analysis, while all management responsibilities were thrust quite expeditiously on Zambian Managers who got exposed to management pressure and responsibilities poor quality expertise, intimidation, shortcut methods to increase production quantities or to reduce production costs without adequate care for plants and equipment life and corrosive damages, substantial fall in the stringent standards dedication and morale maintained in NCZ before OMS era etc., have all put together, more than nullified any advantages gained.

E) INSTALLATION OF SUITABLE COMPUTER SYSTEM

The project's completion required choosing a proper in house computer system so that satisfactory management data including various statistics relating to sales, production, manufacturing costs are available in an integrated fashion. NCZ had been hiring piece meal computer services from various outsiders like IBM,

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Indeco Computer Centre, ICL etc. These were scrappy, inadequate and had to be integrated into an efficient system within the company itself. It therefore, involved perse choosing the optimum system and then integrating sales, payroll, purchasing, stock and stores accounting systems into one efficient viable unit and training NCZ personnel to use the same and improve the systems to be in line with the growing and constantly dynamic management requirements.

In the choosing of the hardware of the computer system, there appears to have been error of judgement as a micro-computer system of ICL DRS-300 was opted upon with 12 mega bytes memory and a fixed disk space of 135 mega bytes. Also the planned configuration could not be set up due to the wrong hardware purchased as the terminals ordered were wrong for the requirements. Further most of the packages bought along with the computer system could not be used because of poor comprehension of the packages e.g. SMB financial packages were useless because they were mainly tailored for retailer's outlet situations. These packages are still lying idle in NCZ.

As regards the development of integrated system to say the least it was exceptionally slow. The integration involved payroll accounting, the sales and debtor accounting, stocks accounting computerisation of invoice, material receipts and spare parts stores to be all integrated with a main ledger system together with ancillary statistical data on production sales, plantwise production costs etc., to be readily available to the management for its decision making. The time frame was to complete these within the first 30 months of the project period, test, de-bug and homogenise the fully integrated system for the next 12 months and then the NCZ personnel to take over operations and developments of the system during the next 6 months. Original idea was that OMS will come with tailor made packages for NCZ and institute the integrated system making it operational within 6 months, but that was an impossible conception. However, until the completion of the extended project period only payroll accounting and industrial accounts systems were completed. The sales, debtor, creditor, nominal, costing and stocks together with the computerisation of the stores for spare parts control were all left incomplete. In a nut shell the overall objective of the integrated accounting system has not be achieved.

As regards training no training of any kind was offered to the computer staff recruited as fortunately well qualified and experienced indigenous Zambians were available who in some cases were more qualified than the OMS computer specialist himself. It thus was instrumental in developing alternate software packages within the company itself in lieu of the wrong SMB softwares acquired along with the computers. The Zambian qualified staff recruited were largely responsible for the payroll accounting, and the industrial accounting systems installed during the tenure of

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the project. They have also, after the completion of the project period, put in place the sales and debtors system, the purchases creditors and stock control system, nominal ledger and sub-accounting systems and have all but completed the integration of the system excepting the computerisation of the stores which is expected to be completed before 1993.

F) DEVELOPMENT OF PROPER ORGANISATIONAL STRUCTURE AND TRAINING FOR CONTINUED VIABILITY OF OPERATIONS.

This is an area where requirements of the project appears to have undergone various changes during the tenure of the project period. Initially there was an erroneous concept that the Zambians had to be trained ab-initio forgetting the fact that they were instrumental in running the plant lines despite defective designs and defective materials of construction and they had operated the Kobe line for over 15 years. This had caused a lot of manhours being wasted in imparting rudimentary knowledge of basic science like mass, temperature, pressure etc. which the operators had actually covered in secondary schools. Further as the project time progressed, it became more and more apparent that the indigenous Zambians were in fact more experienced and knowledgeable than the OMS specialists themselves and if at all some orientation and exposure to modern managerial techniques was only required. But the progress in this regard was minimal if not nil. This is further emphasised by the changes in project requirement vide Letter I and II which altered the management during the rehabilitation from OMS hands with Zambians as counterparts to management by Zambian with OMS as counterparts.

Another major area of improvement required under this project's mandated tasks was to properly organise various procedures and manuals such as laying down the specific startup and operating manuals for each plant, maintenance manuals etc., so that the operators do not go by personal experience alone but have a code or set of procedures to follow and abide by. The progress in this regard was also very poor and even as of now, the Zambian Managers are updating or writing up the various plant manuals.

The status as of now is that it is well recognised by all concerned that proper and adequate managerial and organisational skills for viable operations is available with the Zambian Managers itself and what is required is only (a) Periodic and consistent updating with modern managerial techniques, (b) Minimal or preferably no outside interference in the commercially prudent ways of managing the company and (c) Last but not least, basically necessary working capital and project completion finance. In fact the viability of the company is already vetted by the World Bank when they cleared the 5 year business plan and which can be if felt necessary be appended or referred to in the PCR by the World Bank.

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While there was some truth in the original concept of NCZ being over-staffed and the pruning exercise be undertaken, what really happened was the best of the lot and not the dead wood or the passengers in NCZ who got snipped or pruned. If anything, the initial requirement that middle and senior managers be exposed to modern technology was the most purposeful of the training needs but despite periodic monitoring by various participants e.g. NCZ, OMS, Zisco and World Bank this was left in abeyance and not tackled. It would be very useful for the lender and borrower together with the executor to have open grass root level meetings and progress reckoning procedures so that necessary positive course corrections are instituted administered and monitored say on a 6 monthly or yearly basis.

B) ENVIRONMENTAL STUDY

A study was carried out by a senior OMS official during period July 86 to March 87. The report compiled and published during the said period was just an aggregation of the data already known to NCZ personnel regarding the actual pollutants and their various levels and media of pollution but which were not properly documented in the past by NCZ.

The environmental study report thus officially released in March 87 was just an assimilation of the various laboratory reports; discussions with various shopfloor superintendents and managers and systematic documentation of historical data. Unfortunately the project's real requirements of proposing suitable control technology, design specifications and costing of the modification after analysis of economic benefits derived therefrom etc., were not done at all let alone the question of monitoring their implementation. The report thus being basic rudimentary historical information, has since been filed away.

H) ENERGY AUDIT

Unfortunately during the tenure of the project period there was no study or report undertaken or done. However, since March 91 NCZ's Technical department has been carrying out their own scrutiny and evaluation of all the Energy utilised in the factory with a view to identify all sources of energy wastages and losses in the plant. The Technical department have made the recommendations some of which are at the implementation stage and it is expected that all the recommendations will be implemented fully before 1993 - 94 provided necessary finances therefor are available.

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1) STUDY OF SAFETY PROCEDURES

Two Specialists from OMS came in to assist the running of the Safety section of NDZ with a view to improve efficient functioning of the section and laying down various safety manuals and procedures, as well as perfecting the fire prevention and emergency evacuation of the factory premises. But unfortunately, the first Specialist who worked in this section for only 4 months before he was promoted as Maintenance Manager. During his tenure in the safety section he only managed to introduce the use of bicycles for the movement of Safety Superintendents and revise the plant work permits cards for NDZ workers.

After his departure from the Safety section an exceptionally aged official took over as Specialist to Safety section for a 3 month period during which time he proposed the construction of a firefighting training ground, but only the designing of its layout was done. He also revised the contractors' safety regulations so as to include the welding control measures.

Two seminars were conducted and a senior Specialist from the OMS came to Zabbix for 1 month on a safety audit but no report was published. All in all no major improvements were made in the running of or improving the efficiency of the safety section.

PROJECT COMPLETION REPORT

ZAMBIA

FERTILIZER INDUSTRY RESTRUCTURING PROJECT
(CREDIT 1662-ZA)

PART III. STATISTICAL INFORMATION

1. Related Bank Loans and/or Credits

<u>Loan/Credit</u>	<u>Purpose</u>	<u>Year of Approval</u>	<u>Status</u>
Credit 1545-ZA Agricultural Rehabilitation Project	To encourage and support the Government of Zambia's efforts in policy and institutional reforms in the agricultural sector.	January 1985	Completed
Credit 1630-ZA Industrial Reorientation Project	To improve the foreign exchange allocation and import licensing system, to initiate changes in the import tariff, protection and incentive systems and to increase the promotion of nontraditional exports.	October 1985	Completed

2. Project Timetable

<u>Item</u>	<u>Date Planned</u>	<u>Date Revised</u>	<u>Actual Date</u>
Project Identification			Aug. 83
Initial Project Brief			Feb. 84
Staff Appraisal Report			June 84
Decision not to Participate			Sept. 84
Appraisal			Nov. 84
Issues Paper			Dec. 84
Decision Memorandum			Jan. 85
Post Appraisal Mission/Report			Apr. 85
Staff Appraisal Report (yellow cover)			May 85
Draft President's Report			June 85
Credit Negotiations			Aug. 85
Post Appraisal Mission/Report (grey cover)			Sept. 85
Staff Appraisal Report			Feb. 86
Board Approval			Feb. 86
Credit Signing Date			April 86
Date of Effectiveness	July 86		Sept. 86
Credit Suspension			May 87
Credit Closing Date	Dec. 90	Dec. 91	Dec. 91
Credit Report Completion Date	June 91	June 92	June 92

3. Loan Disbursement

<u>Bank Fiscal Year and Semester</u>	----- US\$ Million (see note) -----		
	<u>Estimated Cumulative</u>	<u>Actual Cumulative</u>	<u>Actual % of Esti- mated</u>
<u>1986</u>			
12.31.85	-	-	
06.31.86	1,000	660	66
<u>1987</u>			
12.31.86	2,000	1,094	55
06.30.87	3,100	1,973	64
<u>1988</u>			
12.31.87	4,200	2,794	67
06.30.88	5,500	3,412	62
<u>1989</u>			
12.31.88	6,800	4,930	73
06.30.89	8,000	5,966	75
<u>1990</u>			
12.31.89	9,000	6,338	70
06.30.90	10,000	7,952	80
<u>1991</u>			
12.31.90	10,000	10,000	100
06.30.91	10,000	10,000	100
<u>1992</u>			
12.31.91	10,000	10,000	100
06.30.92	10,000	10,000	100

Date of Final Disbursement: 10.05.91.

The USD values in the table are calculated on the basis of the conversion factor between SDR and USD prevailing at the time of the appraisal estimates, namely 1.0309. This allows direct comparison between the actual disbursements and those estimated at appraisal. The actual USD equivalent disbursed was \$12,856,800.

4. Project Implementation

<u>Indicators/1</u>	<u>Appraisal Estimate</u>	<u>Actual (or PCR Estimate)</u>
<u>Indicator 1:</u>		
Technical rehabilitation of the NCZ I plant	Completion expected by May 1986	Completed by end of August 1986/2
<u>Indicator 2:</u>		
Technical rehabilitation of the NCZ II plant	Rehabilitation expected to start March 1986 and be 100% completed by December 1987	Rehabilitation started in Jan. 87 and stopped in Nov. 89 with plant being only approx. 60% rehabilitated.
<u>Indicator 3:</u>		
Technical rehabilitation of off-site, infrastructure and environmental facilities	Rehabilitation expected completed by December 87	Not completed by end of 1991
<u>Indicator 4/3:</u>		
Total cost of rehabilitation of NCZ I plant:		
- Local	2.880 mill. ZKW	8.322 mill. ZKW
- Foreign	6.342 bill. Yen	6.342 bill. Yen
<u>Indicator 5:</u>		
Total cost of rehabilitation of NCZ II plant (i.e Phases I, IIA and IIB) /4:		
- Local	1.5 mill. USD	335 mill. ZKW
- Foreign	25.86 mill. USD	71.52 mill USD

Indicator 6:

Total cost of rehabilitation of off-site, infrastructure and environmental facilities:

- Local	0,15 mill. USD	N.A.
- Foreign	5.41 mill. USD	N.A.

Indicator 7:

Provision of Technical Assistance	Totally 423 man-months assistance to be provided in the period 1985 to 1989	Totally 1,073 manmonths assistance provided in the period 1985 to March 1991
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Comments:

1. The staff appraisal report from February 1986 does not contain any clearly defined indicators for project implementation except those related to time required for physical rehabilitation of the two plants and the size of the related costs. Thus, no specific indicators have been defined for OMF performance (except total number of manmonths to be provided) or technical rehabilitation of off-site, infrastructure and environmental facilities, being the major bank financed project inputs.

2. Due to later than estimated entering into force of the contract for NCZ I the actual delay in project completion was only one month.

The completion was valid only for the KOBE Works. The NCZ scope of site works was increased considerably during rehabilitation and these works were only partly completed at the time of completion of the Japanese Contractor's Works.

3. The rehabilitation of NCZ I was kept within the total Foreign exchange financing provided by OECF.

Variation orders issued during rehabilitation, however, only left approx. 20 mill. Yen of the originally allotted 216 mill. Yen contingency as balance for use in connection with purchase of spare parts.

The difference in actual local NCZ expenditure and originally estimated cost was due to increased scope of NCZ site works.

4. The German loan was full utilized in connection with the rehabilitation of the NCZ II plant by KINA but only resulted in approx. 60% plant rehabilitation.

The total local costs of rehabilitating NCZ II amounted to approx. ZKW 335 million in March 1991 and a further investment of approx. ZKW 393 million is envisaged by NCZ before NCZ II plant rehabilitation can be considered completed.

5. Project Costs and Financing

A. Project Costs (US\$ million)

	<u>Appraisal Est.</u>			<u>Actual (3-31-91)</u>		
	<u>Local</u>	<u>Foreign</u>	<u>Total</u>	<u>Local*</u>	<u>Foreign</u>	<u>Total</u>
Engineering & License	-	3.04	3.04)		
Equipment & Materials	0.03	28.14	28.44)		
Freight & Insurance	0.81	3.29	4.10)	218	98.23
Civil Works & Erection	1.26	9.38	10.64)	3.42**	
Spare Parts	-	8.43	8.43)		
Technical Assistance	0.64	6.02	6.66)		
Training	<u>0.10</u>	<u>0.61</u>	<u>0.71</u>)	<u>28</u>	<u>9.76</u>
Base Cost Estimates	3.11	58.91	62.02	--	-----	
Physical Contingencies	0.31	4.79	5.10	--	-----	
Price Contingencies	<u>0.35</u>	<u>1.78</u>	<u>2.13</u>	--	-----	
Total Project Cost	3.77	65.48	69.25	246	107.99	
				3.42**		
Incremental Working Capital	12.07	-	12.07			
Interest during Constr.	-	<u>2.43</u>	<u>2.43</u>	<u>117</u>		
Overall Financing Required	15.84	67.91	83.75	363	107.99	
				3.42**		
NCZ I plant	1.22	26.71	27.93	3.42**	26.71	30.13
NCZ II plant	1.50	25.86	27.36	335	71.52	
Off-site & Infrastructure	0.15	5.41	5.56			
Tech. Assis. & Training	<u>0.90</u>	<u>7.50</u>	<u>8.40</u>	<u>28</u>	<u>9.76</u>	
Total Project Cost	3.77	65.48	69.25	363	107.99	
				3.42**		

* - ZKW

** - US\$

B. Project Financing

<u>Source</u>	Planned (Cr.1662-ZA) Agreement (US\$'000)	Revised 06/16/89 (US\$'000)	Final 03/31/91 (US\$'000)
<u>IDA</u>			
<u>Expenditure Categories</u>			
1. Equipment + Materials	4,200	860	237
2. Technical Assistance	5,300	8,640	9,763
3. Overseas Training	500	500	0
	-----	-----	-----
Total IDA	10,000	10,000	10,000
<u>Co-financing Institutions</u>			
EEC			12,835
KFW/FRG	27,200	-	45,192
OECF/Japan	26,680	-	26,680
MAE/Italy	0	8,000	8,000
NCZ	5,370	-	649
ZIMCO	0	-	16,028
	-----	-----	-----
Total	69,250	-	101,438

Comments:

From the Italian Foreign Ministry a grant of US\$8 mill. equivalent has been provided, partly for financing of additional TA by the OMF and partly for procurement of materials and equipment for phase II B.

6. Project Results

A. Direct Benefits

<u>Indicator</u>	<u>Unit</u>	<u>Appraisal Est. for March 89 /1</u>	<u>Actual for March 89</u>	<u>Actual for March 90</u>	<u>Actual for March 91</u>
<u>Indicator 1</u>					
Annual sales					
AN	MT	95,000	18,247	17,433	73,951
Compounds	MT	120,000	66,796	36,332	95,673
Other	MT	15,000	NA	NA	NA
<u>Indicator 2</u>					
Yearly capacity utilization	%	75	32	25	55
<u>Indicator 3</u> (financial results)					
Sales/other income	Mill. ZKW	<u>489</u>	<u>276</u>	<u>335</u>	<u>2,587</u>
Depreciation	-	41	24	25	31
Interest costs	-	24	7	25	177
Other costs	-	<u>309</u>	<u>256</u>	<u>300</u>	<u>2,000</u>
Total Costs	-	374	287	350	2,214
Net profit/loss before extraordinary items	-	115	-11	-15	373

/1 March 1989 was target project completion date.

D. Studies

<u>Studies</u>	<u>Purpose as defined at appraisal</u>	<u>Status</u>	<u>Impact of study</u>
1. Organizational restructuring study of NCZ	Review and streamlining of NCZ organizational structure. Develop proper systems and procedures for production optimization and cost control and establish financial and management information system	Completed	Limited especially with regard to production optimization, cost control and training of Zambian counterparts
2. Environmental study	Review of possible environmental problems determined by liquid effluents and solid wastes from the fertilizer complex and proposed measures to comply with local/international regulations	Completed	Recommendations being implemented in connection with plant rehabilitation
3. Safety case study	According to recent IDA guidelines to identify possible hazards deriving from the nature of NCZ operations and to recommend corrective actions	Partly completed	Only part of the installations covered by the study
4. Energy audit study	Detailed energy survey unit by unit and for whole of complex indicating level of energy consumption and proposing areas where energy can be saved including proposed measures for same inclusive related costs and benefits	Completed	Major recommendations implemented through plant rehabilitation

Comments:

1. Besides the above mentioned studies the preparation and submittal of which formed an integral part of the services to be provided by the OMF according to the TOR contained in SAR, a number of other studies has been prepared by the OMF during its period of employment.

A list of these studies is attached as Annex No. 1 to the present report.

2. Besides studies prepared and performed by the OMF, major additional studies have also been prepared and performed during the project implementation period as follows:
 - a. "Rehabilitation of Rehabilitation Programme". Financial and Economic Analysis. Nordic Consulting Group, 1990.
 - b. Environmental Study of Kafue Area. ChemControl A/S, 1990.

7. Status of Covenants

Development Credit Agreement

<u>Covenant No.</u>	<u>Brief Description of Covenant</u>	<u>Complis.</u>	<u>Remarks</u>
Section 3.01	Borrower's commitment to the project including the taking or causing to be taken all action including provision of funds, facilities, services and other resources necessary to enable NCZ to perform in accordance with the provisions of the Project Agreement	No	The Government has only partly been able to provide the necessary financial support to NCZ during project implementation and for the outstanding rehabilitation phases II A and II B of the Klochner plant
Section 4.01	Borrower's appointment of properly qualified and experienced NCZ key staff	Yes	
Section 4.02	Borrower's appointment and maintenance of key committees such as Inter-Agency Fertilizer Coordination Committee and the Project Steering Committee	Yes	During project implementation period the Borrower has only partly been able to comply to this Covenant. Due to limitations with Zambian Railways the supply of coal and fertilizer bags to the project has been erratic and the lack of these inputs on site has caused a number of major plant shutdowns. Likewise, frequent interruptions of Zesco's electricity supply to the plant has also caused a series of both technically and financially very damaging production stops

Project Agreement

<u>Covenant No.</u>	<u>Brief Description of Covenant</u>	<u>Complia.</u>	<u>Remarks</u>
<u>Financial Covenants</u>			
Section 4.01	Auditing of NCZ's yearly accounts and financial statements, and submittal of same together with Auditor's report to the Bank	Yes No	Submittal of audited accounts to the Bank has generally been delayed throughout the project implementation period. Audited accounts and Auditor's report for the Fiscal Year 90/91 not yet received by the Bank
Section 4.02	Maintenance by NCZ of a ratio of current assets to current liabilities of not less than 1:1 for Fiscal Years 1985/1986, 1986/1987 and 1:4 for the following fiscal years	No	Due to NCZ's financial plight (para.....), it was not able to attain the required ratios.
Section 4.03	Limitation of debt incurred by NCZ in relation to a minimum permissible debt service ratio of 1:3 beginning in the Fiscal Year 1988/1989 (1st year after estimated completion of rehabilitation project)	No	Ditto
Section 4.04	Limitation of debt incurred by NCZ in relation to a minimum permissible debt-equity ratio of 60 to 40 beginning the Fiscal Year 1985/1986	No	Ditto
Section 4.06	Limitation of NCZ's yearly capital investments without prior Bank consultation, during project implementation period	Yes	Intense consultation between NCZ and the Bank has taken place regarding phase II and especially II A of the project
Section 4.07	Cancellation of NCZ's rights to pay dividends or otherwise to make distributions through reduction of capital during the project implementation period without the Bank's agreement	Yes	No dividends has been declared by NCZ

Project Agreement

<u>Covenant No.</u>	<u>Brief Description of Covenant</u>	<u>Complia.</u>	<u>Remarks</u>
<u>Financial Covenants</u>			
Section 4.08	NCZ to submit quarterly and other reports to the Bank in accordance with the requirements of the letter	Yes	The reports have been submitted, to a satisfactory extent, to visiting Bank missions
<u>Other Covenants</u>			
Section 5.01	NCZ to prepare and implement a comprehensive training programme for its staff in accordance with the Bank's requirements	Yes	...
Section 5.02	NCZ to prepare and submit to the Bank the following studies: - Environmental study - Energy audit study - Safety study and implement the studies' recommendations in accordance with the Bank's views	Yes	The studies have been prepared and major recommendations have been implemented.
Section 5.03	NCZ to prepare an Organisational Restructuring Study and submit it to the Bank for review and comments. Thereupon NCZ to implement the study's recommendations adjusted to the Bank's views	Yes	Study completed by end of April 1986 and subsequently implemented
Section 5.04	Elaboration and submittal by NCZ to the Bank of yearly Plans of Action for reducing NCZ's fixed and operational costs	Yes	Modest cost reductions have been implemented by NCZ during project rehabilitation.
Section 5.05	NCZ to ensure that ex factory fertilizer prices not later than 1.4.88 are set at levels equivalent to CIF landed costs of imported fertilizer	Yes	Fertilizer ex factory prices are based on CIF cost plus a margin (of 15%) and thus exceed the Covenant requirement. Adjustment of prices in consequence of devaluations has, however, been slow
Section 5.06	Installation by NCZ of a NOX-abatement unit in NCZ I before 1.1.1988	Yes	Minor modifications of the Kobe plant led to a reduction of the NOX discharge to a level that complied with the international standards and consequently the installation of an abatement unit was cancelled

8. Use of Bank Resources

A. Staff Inputs

<u>Stage of Project Cycle</u>	<u>Planned</u>	<u>Revised</u>	<u>Final</u>	<u>Comments</u>
Through Appraisal			20.7	
Appraisal through Board Approval			41.7	
Board Approval through Effectiveness				
Supervision			<u>84.1</u>	
Total			162.3	

B. Missions

<u>Stage of Project Cycle</u>	<u>Month/Year</u>	<u>No. of Persons</u>	<u>Mandays in Field</u>	<u>Specialization Represented</u>
<u>Through Appraisal</u>				
Project Identification	Aug. 1983	N.A.		N.A.
Project Pre-appraisal	Apr. 1984	4	64	Technical Organizational Marketing Economic Financial
Project Appraisal	Nov. 1984	4	N.A.	Technical Organizational Marketing Economic Financial
<u>Appraisal through Board Approval</u>				
Post-appraisal 1	Apr. 1985	1	4	Technical Organizational
Post-appraisal 2	Aug-Sep. 85	1	8	Financial Economic
<u>Board Approval through Effectiveness</u>				
Follow-up/Supervision	Sept. 1986	3	18	Technical Organizational & Training Environ. & Safety
<u>Supervision</u>				
Supervision	Feb. 1987	1	4	Engineer
Supervision	Feb. 1988	1	N.A.	Engineer
Supervision	July 1988	1	8	Engineer
Supervision	Nov. 1988	1	4	Engineer

<u>Stage of Project Cycle</u>	<u>Month/Year</u>	<u>No. of Persons</u>	<u>Mandays in Field</u>	<u>Specialization Represented</u>
Supervision	Jan/Feb.89	1	10	N.A.
Supervision	Aug. 1989	2	8	Finance Technical
Supervision	Nov. 1989	1	10	Finance
Supervision	Feb/Mar 90	2	20	Finance Technical
Supervision	May/Jun 90	1	15	Finance
Supervision	July 1990	1	6	Technical
Partial Supervision	Oct/Nov.90	2	5	Finance Technical
Supervision	April 1991	1	3	Technical
Supervision	June 1991	1	3	Finance
Supervision	Aug. 1991	1	5	Technical

No.	STUDY/REPORT TITLE	DATE	PREPARED BY
1	Organisational Proposal prepared by E.A. for NCZ	09.86	E.A. Milano
2	Training Programme (TP) prepared for NCZ by E.A.	10.86	E.A. Milano
3	NCZ's Maintenance Workshop Restructuring Proposal	08.86	Mr N. Cosenza
4	Nitric Acid and Ammonium Nitrate Plants Survey	09.86	Mr Bassetti
5	NCZ's Civil Maintenance Efficiency Optimization Proposal	10.86	Mr Lombardo
6	Study on Safety and Environmental Activities to be Performed at NCZ Kafue Plant	10.86	Mr Barone Mr L. Peres
7	Energy Audit Study at NCZ Kafue Plant	11.86	E.A. Milano
8	Study for the Implementation of NCZ Computerized Information System	11.86	Mr. Pastore
9	Technical Report on the Examination of the Nitric Acid Production Plants	12.86	Mr M. Bassetti
10	Suggestions Report on NCZ's Fertilizers Production	12.86	Mr P. Baccarani
11	Audit of Plant's Safety Equipment - Proposals for Improvements	2.87	Mr D. Barone Mr A. Matera
12	NPK Study	3.87	Mr P. Baccarani
13	NCZ Electrical Maintenance Inspection Report	3.87	Mr G. Priora
14	Environmental Study on NCZ	3.87	Mr L. Peres
15	Seminar on Safety held in NCZ Plant - Kafue, Zambia	5.87	Mr M. Catalano Mr A. Matera
16	Power Distribution - Training Course	5.87	Mr G. Priora
17	NCZ Manpower Development Project 1987-1988 for Maintenance, Production and Technical	6.87	Mr G. Degano
18	Technical Report on Compound Fertilizer Plant control in NCZ	10.87	Mr S. Bascetta
19	Introduction to NCZ Processes	10.87	Mr G. Degano
20	Chemical Laboratory Rehabilitation Project	11.87	Mr G. Calicchio
21	Study on Shipping and Transport	12.87	Mr A. Carlier
22	Logistic Project for Agriculture in Zambia - Bagging Plant Rehabilitation	2.88	Mr F. Besana
23	Technical Study Proposal for Improvement and Modification of the Zesco Subst.	3.88	Mr A. Iurlo