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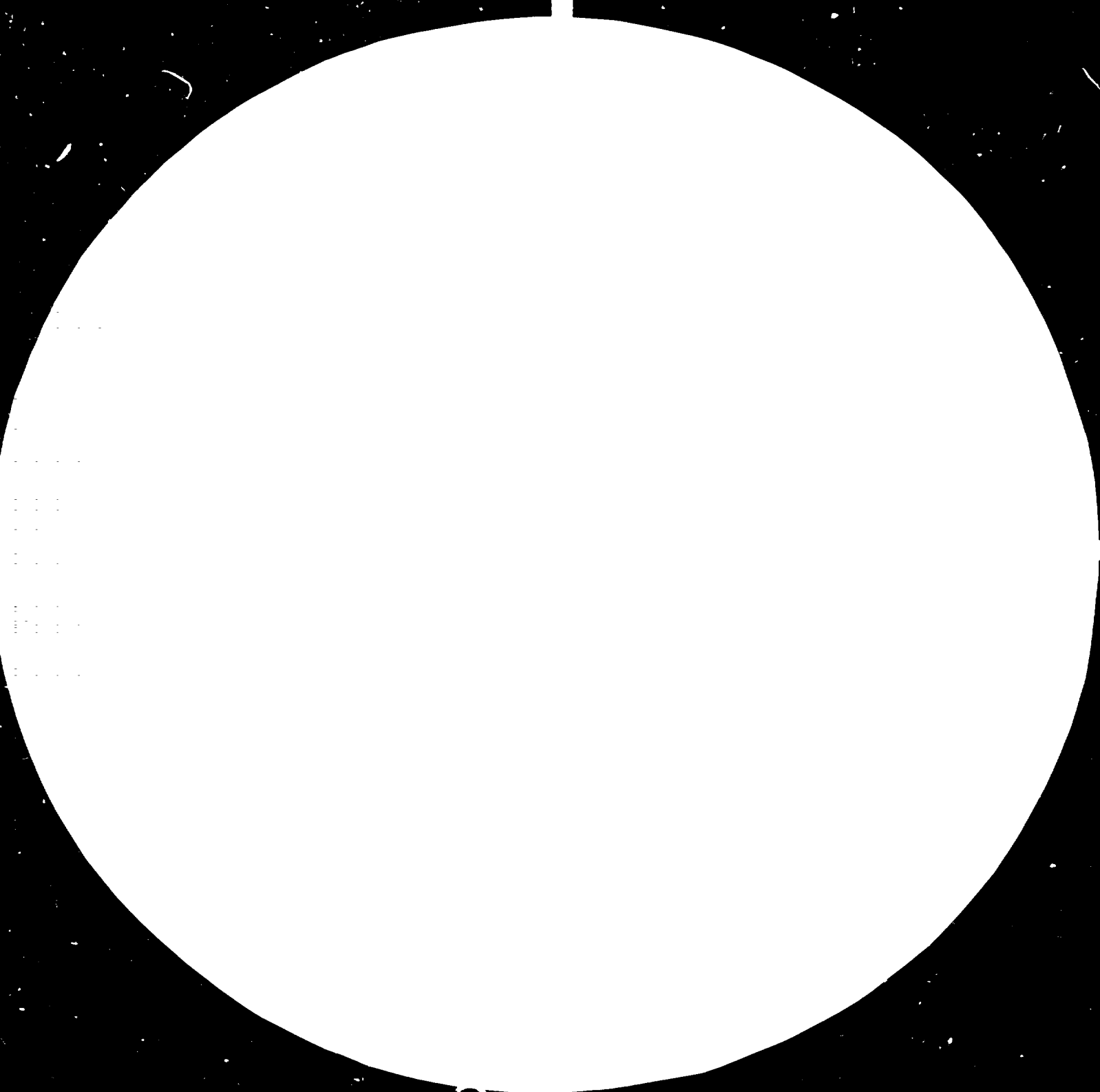
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ASSISTANCE TO THE LIBYAN CEMENT FACTORY, BENGHAZI .

TF/LIB/75/002

LIBYAN ARAB JAMAHIRIYA

Mission report: Preliminary study for long-term technical advice

Prepared for the authorities of the Libyan Arab Jamakiriya
by the United Nations Industrial Development Organization

Based on the work of A.M. Afify,
technical adviser to the cement industry

V.81-33543

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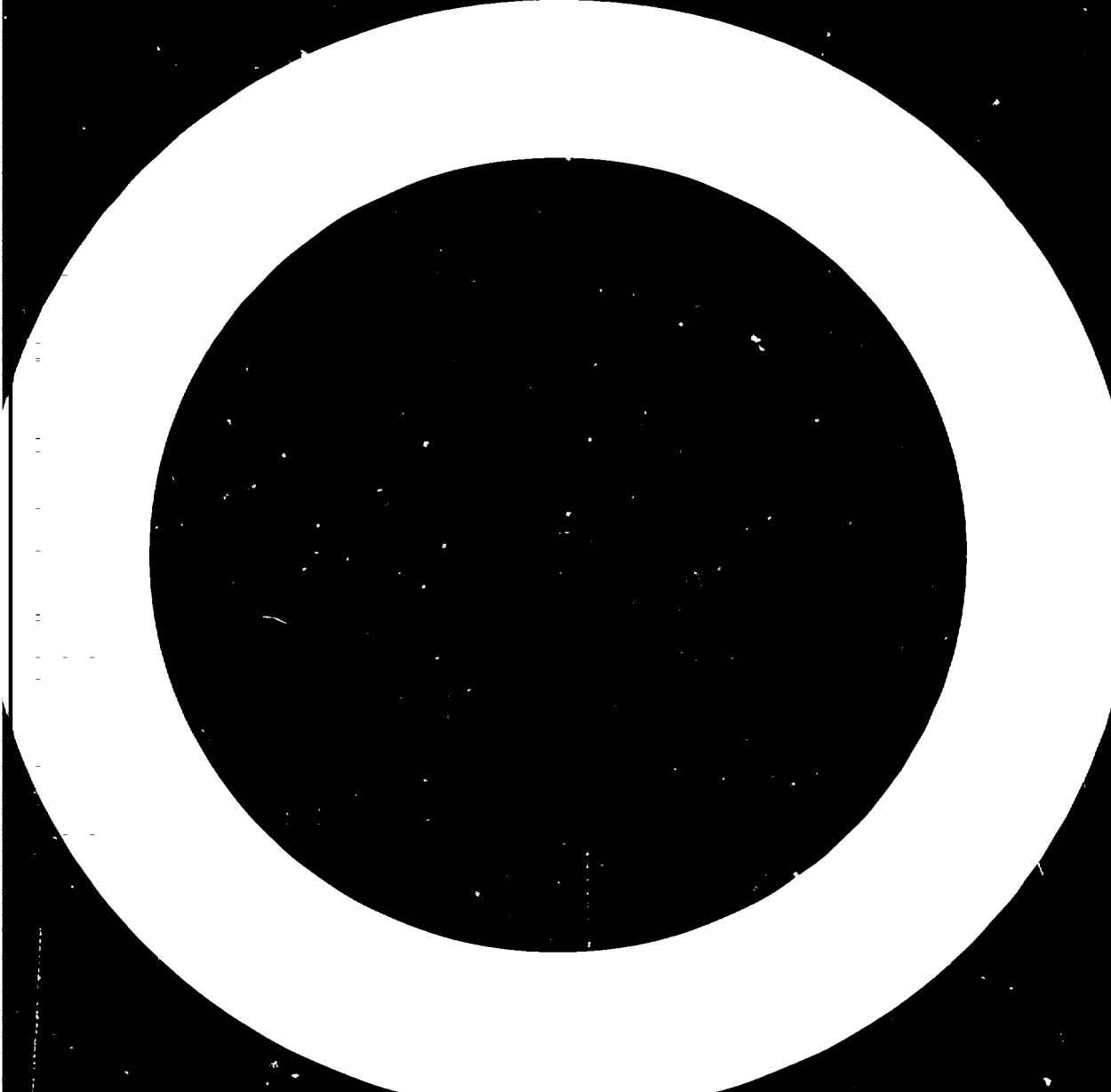
ABSTRACT

The present report covers a one-month mission by the technical adviser to the cement industry under the project, "Assistance to the Libyan Cement Factory, Benghazi" (TF/LIB/75/002), carried out by the United Nations Industrial Development Organization (UNIDO) for the Libyan Arab Jamahiriya. The mission lasted from 20 October to 20 November 1981 and the adviser was based in Tripoli.

This mission was the introductory phase of a long-term plan of action involving technical co-operation with the Secretariat of Heavy Industries in the supervision of the rapidly-expanding cement industry. It is envisaged that the technical co-operation will include advice and guidance on the development of studies, supervision of production progress and assistance with solving operational problems.

To assess the situation, introductory visits were paid to the Libyan Cement Company (Benghazi), the Al-Khums I and Al-Khums II Cement Plants, the Souk-El-Khemis Cement Works, the Fatayeh Cement Project (Derna) and the Zliten Cement Project, and discussions were held with all the relevant personnel.

The specific issues and problems discussed at each factory are detailed in the findings. Recommendations are made for developing national technical expertise through on-the-job training; the construction of residential villages near the factory sites for the staff; developing local paper-bag production; carrying out studies of local raw-material resources; introducing production of special cements; ensuring adequate preventive maintenance and spare-part stocks; keeping production data up to date; developing industrial safety principles and revising the organization charts and job descriptions.



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INTRODUCTION

The project, "Assistance to the Libyan Cement Factory, Benghazi" (TF/LIB/75/002), represents a new form of technical assistance with direct support to industry. The project is being financed by the authorities of the Libyan Arab Jamahiriya through a trust-fund arrangement with the United Nations Industrial Development Organization (UNIDO).

The project started with a short mission (February to March 1976) by this expert as building-materials adviser. He was then fielded several times (from November 1976) for a total of 36 months, during which he also acted as project co-ordinator. He was repatriated in February 1980 when a new project co-ordinator, A.R. Marei, was assigned to the project. At the request of the Libyan authorities, the adviser was again fielded for three one-month missions (beginning 4 May 1980, 11 November 1980 and 19 May 1981) to review and evaluate the progress of the project. The Libyan authorities then requested the expert for a long-term assignment as technical adviser to the cement industry in general under the new project number TF/LIB/81/002. As the agreement for this assignment was still under discussion, the expert was fielded for one month from 20 October to 20 November 1981 under financing from the project TF/LIB/75/002. (The job description is given in annex I.) This one-month mission to Tripoli should be regarded as the exploratory phase of the longer-term assignment and this report as a preliminary study for the technical-advice project.

Cement is considered as fundamentally important to the economic development of the country as a whole. Since its beginnings in 1968, the Libyan cement industry has been constantly expanding until it now has a yearly production capacity of 4.4 million tons of cement and includes a whole complex of building-materials plants. Two cement works are under construction in the eastern and western regions and one is being planned for the southern region which will bring the yearly production capacity up to nearly 7 million tons by 1990.

This great expansion in the cement industry and the increasing need for trained personnel led to the development of the UNIDO technical-assistance project and will require continued technical co-operation between UNIDO and the Secretariat of Heavy Industries.

The planned long-term technical advice is designed to cover several fields:

(a) Studies of the cement industry, including the revising and bringing up to date of previous information and the development of new studies to enable rational planning of future projects;

(b) Supervision of production progress, including the introduction of unified reporting of production data which can be compared with target figures;

(c) Assistance to production units, those already operating, those under construction and those still in the planning stage, to help them deal with the problems which arise.

The national counterpart during the mission was Mohamed El-Taher, in charge of affairs relating to cement studies in the Department of Engineering and Projects (Secretariat of Heavy Industries) and secretary of the committee for the cement project in the southern region.

RECOMMENDATIONS

Detailed suggestions for each plant are given in the next chapter. General recommendations for the development of the whole project are summarized here.

Building national technical expertise

The rapid expansion in various industrial fields has vastly surpassed local manpower resources.

1. A comprehensive plan for training national manpower and improving local skills should be put into effect in the existing plants.
2. Complete groups should be trained in preparation for starting up new projects.
3. The commissioning groups and the technical-assistance teams should be considered as sources of training and should be gradually reduced until the national personnel can take over.

Local paper-bag production

It has been noticed that production was interrupted in some cases and hampered in others due to defective paper bags. In some cases, the delay in import proceedings led to a complete stoppage of cement packing. The local paper-bag industry is equipped with first-class machinery and has an ample production capacity, but production is limited because there are not enough experienced technical staff.

4. This difficulty should be overcome and the local production of paper bags promoted by making enough technical personnel available.

Accommodation

Accommodation is one of the main problems faced by technical personnel. The provision of adequate housing would certainly help to attract well-qualified and experienced staff to the duty stations.

5. Residential villages for staff should be constructed wherever necessary.

Review of raw materials

The difficulty and cost of using imported materials such as bauxite make it necessary to review local raw-material resources.

6. Previous raw-materials studies must be revised and complementary geological investigations undertaken, possibly using the prospecting facilities of the Industrial Research Centre.
7. The raw-mix composition must be redesigned so that local raw materials can replace imported ones.

Special cements

8. To supply local demand and to improve the economic efficiency of the plants, production of special cements should be introduced starting with mixed cements and rapid-hardening cement and moving on into the production of sulphate-resisting cement and oil-well cement.

Preventive maintenance and spare parts

Most operational problems could be eliminated if machinery and equipment were kept in a satisfactory operational condition and there were a sufficient stock of spare parts for carrying out maintenance, overhauls and running repairs.

9. Plans already drawn up for preventive maintenance should be put into effect together with the properly planned ordering and storage of spare parts.

Up-to-date production data

A daily review of the production situation by those in charge of operations would show up difficulties and indicate bottle-necks and this would make it possible to work out appropriate solutions before major problems develop.

10. The utmost importance should be given to procuring up-to-date production data.

Industrial safety principles

It is of prior importance to ensure the safety of both personnel and machinery.

11. The promotion of industrial safety should be achieved by making use of the experience of specialized advisers available on various levels.

Organization charts and job descriptions

12. In most cases, the old organization charts should be revised to suit the existing situation.

13. Precise job descriptions should be drawn up to clarify the main requirements for each post.

FINDINGS AND CONCLUSIONS

A. General plan of action

The Under-Secretary for Heavy Industries expressed the Secretariat's wish to improve supervision of the cement industry in various ways as shown below.

Review of production in existing cement works

This would be intended to provide a continuous check upon the correspondence between actual production and production targets. Production figures are communicated weekly to the production department of the Secretariat where an engineer is assigned to record the figures and add them up for comparison with production target figures. He also investigates stoppages, evaluates the reasons given for these and collects all the information necessary for providing appropriate advice or assistance.

The Under-Secretary for Heavy Industries asked for a unified report form which would include the most important data and give a full picture of production characteristics. The expert proposed a form to record data on production: issue and stocks of clinker, bagged and bulk cement, lime and gypsum plaster. These forms would be telexed to the Secretariat every 10 days where they would be recorded, added up to give monthly totals that could easily be compared with the planned targets. After discussions in the Secretariat and at the plants, the proposed form was officially submitted to the Under-Secretary for general circulation. Its adoption is proposed as from the beginning of 1982.

General study of the cement situation

The whole cement situation has to be reviewed. There are several earlier studies which give a distinct picture of the whole cement market, forecast local cement demand and indicate future possibilities for the export market in view of anticipated developments in the region. The last study was carried out by the Swiss firm of consultants, Prospective Engineering Gestion, but their findings are now some years old and the information has to be brought up to date.

Assistance to production units

The success of the cement industry is fundamental to the country's whole economic development. It is proposed to give more advice and practical assistance to the cement industry by:

- (a) Helping to solve problems which arise in the existing factories;
- (b) Keeping a close supervision of the progress of plants under construction and the preparation of items necessary for commissioning and start-up;
- (c) Carrying out feasibility studies or evaluating existing studies for future projects under consideration.

To make a realistic plan for carrying out this kind of assistance, introductory visits were made to the various plants and the particular problems of each were investigated.

B. Libyan Cement Company, Benghazi

A visit to the building-materials complex took place on 3 November 1981 at which discussions were held with the UNIDO project co-ordinator, the Polservice team leader, the general director, the production manager, the legal adviser, and, for the training centre, the director and the training adviser. The following subjects were discussed:

Technical-assistance team

The project TF/LIB/75/002 is proceeding well. The technical-assistance team is performing its duties according to the job descriptions with special emphasis on the training aspect. Problems over payment for flight tickets and excess baggage were solved during the visits of UNIDO staff members to the duty station. It is now arranged that Polservice will pay and then claim a refund. The problem of accommodation is on the way to being permanently solved as an ample housing complex is being constructed in the factory zone. It is anticipated that the housing will be ready around the end of this year, at which point it will be possible to field a larger number of experts, possibly up to 100 persons. The present state of the team was reviewed.

The total number of experts who have been fielded up to now is 156, of whom 76 are at present on the site and 80 have already been repatriated at different stages of the project. (For details, see annex II.)

Cement forum in April 1982

Discussions were held with the project co-ordinator and the training adviser about what preparatory steps should be taken for holding the forum in the Benghazi Training Centre. They were provided with copies of the UNIDO proposal for the purchase of equipment for simultaneous translation into Arabic, English and French. Enquiries were made about the dimensions of the conference hall and plans for the seating arrangements. It was agreed that the training centre will send information directly to UNIDO by telex followed by a more detailed letter, with copies to the Secretariat of Heavy Industries, so that communication will be faster in view of the short time remaining for preparation. A committee will be formed including representatives from the Secretariat of Heavy Industries, the Industrial Research Centre, and the Secretariats of Planning and Housing to promote efficient execution of decisions and good communications between all the authorities concerned with this forum.

Training programmes

It has been decided that the Benghazi Training Centre should give assistance with training programmes in sister companies so that they may make use of its resources. The training adviser stated that, during his last visit to cement factories in Leptis Magna, Al-Khums and Souk-El-Khemis in the company of the director of the training centre, it was agreed with the personnel there that training facilities should be extended to an appreciable number of staff members at the work sites, with special emphasis on industrial safety. It was decided that leading personnel should be trained so that they in turn could make these courses available on the site. It was agreed to arrange a training programme on problem-solving and decision-making on 14 and 15 November 1981 at the Al-Khums factory for members of the people's committee and leading personnel. Courses on

industrial safety (one in January 1982 and another in May 1982) for top management, and on informative safety (six sessions to be arranged in January, March, May, July, September, November 1982) were also planned. These courses will be organized by specialists at Souk-El-Khemis after preparation.

Disciplinary regulations

The legal adviser's views were sought on the idea of making standardized work regulations available, with a unified core and differing only according to local variations in factory circumstances. The legal adviser stated that the General People's Committee had already issued some regulations. Other regulations were still being prepared for issue in the near future and should be adopted as soon as they are issued. He therefore suggested waiting for the issue of these regulations which could be treated as a general framework to which some stipulations relating to particular factories could be added without changing the principal structure of the main regulations.

C. Al-Khums I Cement Plant

This factory was visited on 10 November 1981 when various questions were examined with the Secretary of the People's Committee and those responsible for production. The most important questions were:

Raw-materials study

One of the most fruitful endeavours would be a review of raw materials with the aim of replacing imported bauxite by local clay, having first established a suitable additive and an appropriate raw-mix design. It was agreed to use existing raw-material studies and to carry out complementary investigations locally.

Possible production of special cements

This possibility should be explored, especially in the field of mixed cements, rapid-hardening and sulphate-resisting cements. This could be done in conjunction with the raw-materials study mentioned above and the planned general maintenance and repairs would be an appropriate starting point.

Difficulties in production process and maintenance

Various bottle-necks exist. Many of the outstanding problems were discussed and a close co-operation has been planned to try and arrive at adequate solutions.

Production standards

It was pointed out that the most useful tool for ensuring efficient production was up-to-date production data. A general outline of the figures to be reported every 10 days to the Secretariat of Heavy Industries was discussed and consideration given to monthly differences which would show up between book figures and actual measurements.

Detailed job descriptions

These have to be drawn up in reasonable conformity with arrangements already adopted in sister cement plants and taking advantage of the considerable experience obtained in this field in some of the well-established cement works.

Manpower planning

From the exchange of views, it became apparent that the plant is suffering from an acute shortage of the technical manpower which is necessary for efficient operation and maintenance and for solving the technical problems which arise. The situation will be studied in an effort to improve the supply of technical personnel.

A quick look at the plant shows quite a lot of technical difficulties which need dealing with. It is hoped that a considerable part of these difficulties will not occur after the planned maintenance and repairs have been carried out and after a solution is found to the problem of the shortage of technical manpower.

D. Al-Khums II Cement Plant

This new plant, installed at Leptis Magna, was visited on 9 November 1981. Various aspects of rationalization were negotiated with the Secretary of the Production Committee, the production manager, and the electrical engineer in charge. The following fields were discussed:

Extension of the technical-assistance contract

The Indian firm, International Development Consultant, is managing the operation and maintenance through a group of technical personnel totalling 245 persons ranging from normal workers to leading engineers. The first phase of the contract was over at the end of September 1981 and is being followed by a transitional period of six months under the same conditions. It has been agreed to introduce training procedures for the national personnel to promote local skills. As the existing contract is now being thoroughly reviewed, a training clause could be introduced without prejudice to the progress of production.

Electrical current

Interruption of the electrical current is a very serious problem as it causes a lot of harm to the refractory lining of the furnace. The feasibility of providing a portable power-generating unit was investigated after studying the work loads and the possibility of connecting up a provisional power supply.

Organization chart and job descriptions

The original organization chart will be reviewed to incorporate the operational practices actually in use since the provisional take-over. Precise job descriptions will have to follow for each specialization, making use of experience already gained in the Libyan Cement Company in this respect.

Disciplinary regulations

Work on these has been postponed so as to allow for the issue of the standardized regulations presently under study by the General People's Committee. Transitional regulations can be applied until the said issues are at hand.

Follow-up of production procedures

The proposed 10-day report summing up the production, issue, and stocks of clinker and bagged and bulk cement was the subject of intense discussion. It was made clear that the Secretary of Heavy Industries would officially announce the starting date of this reporting scheme so that there would be no misunderstanding among production units.

Industrial safety measures

Measures essential for industrial safety will be taken in the factory, making use of experience from the Benghazi Training Centre. Supervisory training sessions are planned during January and May for leading personnel. From the factory inspection, it was established that the production process is well-planned and maintained. The most serious problems arise through cement hardening, especially in the packing plant, where there is trouble with closed paper-bag valves.

E. Souk-El-Khemis Cement Plant

The plant was visited on 12 November 1981. Discussions were held with the works manager and the persons responsible for production, statistics, and electrical maintenance. The discussions covered the following aspects:

Review of technical manpower

The technical management contract of the firm, Khune (Federal Republic of Germany), operates through 20 Yugoslav technicians. In addition, about 120 Indians are employed as well as a number of technicians from Turkey and other countries. It was agreed to review the manpower situation and to arrange for the introduction of training for the local staff so that they can master operation and maintenance techniques as soon as possible.

Unified production figures

There was a discussion of the proposal to notify the Secretariat of Heavy Industries every 10 days of the figures for production, issue and stocks of clinker, bagged and bulk cement and lime. Possible ways of resolving the problem of differences between the production and statistics departments were discussed.

Standardized organizational regulations

There was a discussion on how to establish an organization attuned to the special local conditions and also making use of the experience gained in this field by sister cement companies. It was understood that the question of organization has been entrusted to Garyounis University who are submitting a draft proposal for discussion before the document is finalized.

The problem of water supply

There is still a water-shortage problem. Out of the seven deep wells dug so far, only two are productive and that only to a limited extent (14 cubic metres an hour compared to a total requirement of 60 cubic metres an hour for the cement and lime factories). It was decided that the most appropriate solution would be to dig four deep wells in the Subeia region, and to build pipelines from there and from the lake in the Maganin Valley. The project was put out to tender. Offers submitted are under consideration. It has been agreed to give special priority to the water problem and to seek close co-operation with the Secretariat of Heavy Industries in this matter.

Maintenance of measuring and control equipment

The preliminary investigation has shown that a major problem is the shortage of spare parts and lack of well-trained national instrumentation specialists. A system of preventive maintenance should be put into effect and the present facilities for repair, calibration and maintenance of instrumentation should be extended and reinforced with more repair and calibration equipment.

From the short introductory visit to the factory, it could be seen that considerable efforts are being made to deal with operation and maintenance problems with patience and goodwill. It is to be hoped that these efforts, in co-operation with sister cement factories, will be highly successful.

F. Fatayeh Cement Project, Derna

The construction site was visited during the period 4-6 November 1981 and discussions were held with the Secretary and another member of the Follow-up Committee. Discussions also took place with the resident and electrical engineers of the consultants (Holderbank Management and Consultancy). On the 5 and 6 November 1981, the Under-Secretary for Heavy Industries and the General Director of the Engineering and Projects Department paid a visit to the site. An expanded meeting was held with representatives of the Secretariat for Heavy Industries, the Fatayeh Project Committee, Holderbank Management and Consultancy, Mitsubishi Heavy Industries and the adviser. At this meeting and through discussions, the following points were clarified:

Review of construction progress

On 1 November 1981, the amount of work achieved compared to the progress scheduled for that date was as follows:

	<u>Achieved</u>	<u>Scheduled</u>	<u>Fulfilment</u>
Excavation	142 000 m ³	182 000 m ³	78.5%
Concrete work	80 000 m ³	100 200 m ³	80%
Steel construction	1 460 t	4 300 t	34%
Mechanical erection	... ^{a/}	...	21%
Electrical erection	15%

a/ ... Data not available.

The planned schedule

The timing for completion of various critical points has been given by Mitsubishi representatives as follows:

Limestone and clay crushers	1 May 1982
Water system	31 March 1982
Compressed-air system	10 June 1982
Administration building	October 1982
Sewage system	June 1982
Gypsum crusher	10 July 1982
Fuel-oil system	10 June 1982
Service station	October 1982
Chemical laboratory	May 1982

Electrical-current requirements

The contractor gave the electrical-current requirements for each stage of the planned construction schedule as:

500 kVA	15 Feb. - 30 March 1982
6 000 kVA	1 April - 30 April 1982
10 000 kVA	1 May - 30 August 1982
50 000 kVA	1 Sept. 1982

The consultant thought that these dates were very optimistic. An aerial high-tension line is being installed to connect Bomba to the project. As this installation is scheduled for completion by the end of February 1982, the help of the Secretary for Electricity is being sought to ensure a fast supply.

General Co-ordination Meeting

This was scheduled to take place in Hiroshima starting on 16 November 1981. The contractor is supposed to submit extensive information and a complete set of documentation for revision and completion. In order to give

the contractor ample time to prepare this documentation, it was agreed to postpone the meeting for one week (i.e. until 23-27 November 1981). At the contractor's request, the postponement was then extended by a further day.

Requirements for the start-up

It was agreed that a complete set of documentation would be provided during the General Co-ordination Meeting in Hiroshima so that the engineers of the consulting firm could check that it would be adequate for operation and maintenance. The contractors also agreed to submit a proposal covering procedure for the acceptance tests and to provide information about commissioning requirements such as limestone, clay, gypsum, iron ore, fuel, water, paper bags, wooden pallets, shrink foils etc.

Raw materials

An adequate supply of the raw materials needed for commissioning and start-up has to be provided. As from 1 May 1982, a daily limestone supply of 3,800 tons (based upon 1,011 kg of limestone per ton of clinker), and a clay supply of 2,000 tons per day (based upon 543 kg of clay per ton of clinker) will be needed. An iron-oxide stock of 5,000 tons has to be prepared for three month's consumption (based upon 10 kg of iron oxide per ton of clinker). A gypsum stock of 5,000 tons would be sufficient for one month's consumption (based upon 5% of the maximum production capacity) as from June 1982. In this connection, it was decided to investigate the possibility of procuring gypsum from the El-Ebiar region and of the Industrial Research Centre carrying out geological prospecting in this area. A study comparing the cost of gypsum imports with supplies from the Sedra region, known to be a reliable gypsum source, should also be made.

Quarrying equipment

This was all ordered and most of it arrived through Benghazi harbour. The remaining portion is on the way. As soon as it arrives and the quarries are opened, it will be possible to train local personnel in this field and build up ample stocks for commissioning.

Road to the clay quarry

Negotiations were held with the Korean Hyundai Company who reduced their price for the job and work may be started shortly. A temporary road could be used for opening up the clay quarry until the new road is in operation.

Fuel-oil supply

The contractor will specify the required quantity and timing for fuel-oil supplies. The storage capacity is designed for 15,000 tons which is ample for two months' needs and will provide a buffer against possible future shortfalls in fuel-oil supplies.

Water requirements

These have been specified by the contractor as 1,276 cubic metres a day. The water supply is ample as the four deep wells which have been dug proved to be sufficient to cope with total requirements. The contractor stated that the water system will be ready by the end of March 1982.

Lubricants

Lubricants were ordered according to the specifications and quantities communicated by the contractor. The major part of the consignment is already at hand, the rest is on the way.

Paper bags

The requirement is for 3-ply paper bags of 50-kg capacity, with the dimensions 400 x 300 x 150 mm. It was agreed to import 1 million paper bags to be ready at the site before the end of June 1982.

Wooden pallets

A local contractor will supply wooden pallets at the rate of 13,000 units (1200 x 1000 mm) in each of the start-up months. The first batch will be ready for use before the end of June 1982.

Shrink foils will be prepared with the pallets at the rate of 27 rolls per month, with special attention to requirements during the commissioning period.

Telephone and wireless communications

Negotiations are being carried out with the Derna Post and Telephone Department for laying a telephone cable to Martuba and connecting the required telephone lines to the factory. A frequency for wireless communication has been applied for.

Technical manpower

A team of 120 technicians with diverse specializations will be assembled. Tenders are being obtained from the state commercial enterprise, Polservice, Warsaw, Poland, from Polytechna, Prague, Czechoslovakia, and from Tesco, Budapest, Hungary. Advance recruitment action has been initiated by UNIDO within the framework of a reimbursible loan agreement. From Korea, an offer will be submitted by Hyundai Company directly to the Fatayeh project committee in Derna. When all the tenders are in, representatives of these firms will be invited to negotiations in Tripoli and the successful tenderer will be selected.

To fulfil the training requirement clause in the general contract, a group has to be selected to receive full-time training for one year for this project.

Housing for workers

The civil contractor, Polimex Cecop, promised to make part of their accommodation available for civil personnel. The first part, able to accommodate 200 persons, will be ready in July 1982. A contract is being prepared for progressive purchasing of accommodation from Polimex Cecop according to a definite time schedule. Service facilities for the expected number of personnel are also being sought.

Site services

In view of the special site location far away from Derna town, the Under-Secretary for Heavy Industries advised that provision should be made for complete on-site service facilities including catering, medical treatment, transport, work clothes etc.

G. Zliten Cement Project

A follow-up review was held with the contractor's representatives, the engineer in charge on the site and the persons responsible for this project in the Secretariat of Heavy Industries.

The construction site was visited on 10 November 1981. A review of progress is necessary to determine requirements for the forthcoming stages. The contractual stipulations prevailing so far have to be scrutinized to see what measures need to be taken to continue this project successfully.

Annex I

JOB DESCRIPTION

TF/LIB/75/002/11-01/C/ 32.1 A

Post title Technical adviser to the cement industry

Duration One month

Date required As soon as possible

Duty station Tripoli with travel in the country

Purpose of project

Duties The expert will be assigned to the Secretariat for Heavy Industries in Tripoli to advise and assist in the development of the cement industry. Specifically the expert is expected to:

- Participate in the national planning of the cement industry in the light of the factual evaluation, marketing and utilization of cement and advise wherever requested on matters within his competence in the cement industry.
- Participate in studies in the cement industry, regarding problems of existing industries, substantial extensions, or the feasibility of new projects.
- Advise on industrial research, assessment of results, and on the follow-up measures to be taken.
- Participate in planning and preparation of reports and statistics indicating general trends for the cement industry and the possibility for utilization of international experience and research.
- Discuss with technical experts about their work and evaluate their achievements.
- Present technical views and take part in discussions with contractors for concluding most suitable stipulations to local conditions.

- Follow-up to new projects with evaluation of timing and technical progress, participate in acceptance tests and identify deficiencies during taking over procedures.
- Advise national key personnel in project activities and training through co-operative support related to the performance of their technical duties.
- Participate in interviewing and selecting technical assistance teams to be assigned to industrial projects, participate in evaluation and formulation of agreements and give supervision for appropriate acquaintance of teams to their duties.

The expert will also be expected to prepare a final report, setting out the findings of his mission and his recommendations to the Government on further action which might be taken.

Qualifications

University degree in Engineering or Chemistry with not less than 25 years experience in cement technology - including technical and managerial experience in cement industry, ample knowledge of its studies, and projects execution in all stages.

Language

English; Arabic and German desirable

Background Information

Cement industry started in the Libyan Arab Jamahiriya by starting up the first rotary kiln in Khoms Cement Works in 1968 with a yearly production capacity of 100,000 tons. In virtue of the special role of cement as foundation for progress in all activities and ideal for utilization of national resources in the course of the ambitious development of the cement industry within the national development plan, the Libyan authorities have devoted a special importance for advance in cement industry through extensions in the existing plants and installation of several new factories in various parts of the Libyan Arab Jamahiriya. The yearly production capacity has reached the present level of 4,440,000 tons cement being produced by four works to which is to be added 2 million tons from two works under construction in the eastern and western regions plus 0.5 million tons for a project under study for installation in the southern region, thus raising the yearly production capacity to 6,940,000 tons in 1990.

Statistics and forecasts prepared for the Secretariat of Planning have anticipated a yearly cement consumption of 8-10 million tons by the year 2000. This will require a continuous expansion of existing cement plants and additional factories to be installed.

The vast developments in cement industry call for technical co-operation between UNIDO and the Secretariat of Heavy Industries in order to cope with the said activities with the help of the necessary technical support and advice.

Annex II

STATE OF THE TECHNICAL ASSISTANCE TEAM ON 1 NOVEMBER 1981

SER NO.	SPECIALISTS NAMES	POST TITLES	BUDGET LINE	GR NO	FIELDING DATE	REPATRIAT. DATE	PREV. LINE
1	TOPOLNICKI, Tadeusz	Shift leader	11-06/A	1	31.05.78	04.03.80	11-07/D
2	KAZIMIERCZAK, Jan	Shift leader	11-06/B	1	31.05.78		
3	BODZIOCH, Jan	Shift leader	11-06/E	7	06.08.80		
4	JUCHKEWICZ, Jan	Shift leader	11-06/D	3	16.11.79	10.09.81	
5	LUCHOWSKI, Wladysl.	Shift leader	11-06/	14	28.10.81		
6	SKUPIN, Feliks	Shift leader	11-06/A	1	14.05.81		
7	KOSS, Zygmunt	Shift leader	11-06/C	1	04.03.80		
8	NYTKA, Zdislaw	Shift leader	11-06/D	1	31.05.78	28.08.79	
9	WARZYC, Stefan	Shift leader	11-06/B	1	23.07.78	17.04.79	
10	TACHYMCZYK, Bogdan	Cont. Pan. Op.	11-07/A	8	25.09.80		
11	KOSCIELNIK, Bolesl.	Cont. Pan. Op.	11-07/B	1	31.05.78		
12	PACUSZKA, Tadeusz	Cont. Pan. Op.	11-07/C	14	07.10.81		
13	KRYMOWSKI, Josef	Cont. Pan. Op.	11-07/D	3	14.11.79		
14	SLIWA, Andrzej	Cont. Par. Op.	11-07/D	7	20.08.80	20.08.81	
15	CHEBA, Zdzislaw	Cont. Pan. Op.	11-07/C	3	14.11.79	12.03.81	
16	SMERCZYNSKI, Janusz	Cont. Pan. Op.	11-07/A	3	14.11.79	05.06.80	
17	BERKA, Andrzej	Cont. Pan. Op.	11-07/B	1	31.05.78	26.07.78	
18	MAKULSKI, Waldemar	Cont. Pan. Op.	11-07/A	1	31.05.78	15.04.79	
19	KURZEPA, Jan	Miller	11-08/A	6	13.03.80		
20	STANCZAK, Jerzy	Miller	11-08/D	10	26.03.81		
21	PALASZYNSKI, Josef	Miller	11-08/E	7	06.08.80		
22	GOSPODARCZYK, Andrzej	Miller	11-08/F	7	20.08.80		
23	SWITALA, Bernard	Miller	11-08/H	10	26.03.81		
24	KONOPKA, Roman	Miller	11-08/I	3	16.11.79		
25	SEDLAK, Marian	Miller	11-08/J	14	07.10.81		
26	JAKOBZAK, Pawel	Miller	11-08/K	14	07.10.81		
27	ZADLO, Jan	Miller	11-08/L	14	07.10.81		
28	PALASZYNSKI, Stanis.	Miller	11-08/M	14	07.10.81		
29	KOPA, Erwin	Miller	11-08/G	7	06.08.80	29.10.81	
30	DUJKA, Mieczyslaw	Miller	11-08/H	8	25.09.80	24.09.81	
31	MAJEWSKI, Jan	Miller	11-08/B	1	31.05.78	24.09.81	
32	JOZWIAK, Mieczyslaw	Miller	11-08/C	7	06.08.80	13.08.81	

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33	RAJCHERT, Stanislaw	Miller	11-08/C	1	31.05.78	26.06.80	
34	STEPINSKI, Henryk	Miller	11-08/D	1	31.05.78	28.08.79	
35	HEIN, Ginter	Miller	11-08/A	1	31.05.78	17.05.79	
36	TERPILOWSKI, Wacław	Burner	11-09/A	3	14.11.79		
37	KACZMARCZYK, Edward	Burner	11-09/B	13	03.09.81		
38	TELEGLÓW, Stanislaw	Burner	11-09/E	13	03.09.81		
39	KUSCHILL, Jacek	Burner	11-09/F	7	06.08.80		
40	RACHTAN, Tadeusz	Burner	11-09/G	7	06.08.80		
41	TOMCZAK, Stanislaw	Burner	11-09/H	13	03.09.81		
42	SZYMANIS, Ryszard	Burner	11-09/	14	07.10.81		
43	KOZERA, Tadeusz	Burner	11-09/E	7	06.08.80		
44	RESZYNSKI, Hieronim	Burner	11-09/B	6	03.04.80		
45	LUCZAK, Zbigniew	Burner	11-09/C	1	31.05.78		
46	BRODZINSKI, Jan	Burner	11-09/D	1	31.05.78	07.03.79	
47	SZADLOWSKI, Pawel	Burner	11-09/B	1	31.05.78	28.08.79	
48	BRZEZINA, Boleslaw	Mech. Main. For	11-10/	13	03.09.81		
49	JEDRZEJCZAK, Seweryn	Mech. Main. For	11-10/C	1	03.09.81		
50	SALWACH, Jozef	Mech. Main. For	11-10/D	6	13.03.80	16.07.81	
51	WOZNIAKOWSKI, Wojc.	Mech. Main. For	11-10/D	2	31.08.78	27.11.79	
52	JEDRZEJCZAK, Romua.	Mech. Main. For	11-10/B	1	31.05.78	28.11.78	
53	SZYPULSKI, Zygmunt	Mech. Main. For	11-10/A	1	31.05.78	28.11.78	
54	MATIASZEWSKI, Jan	Fitter M. Main	11-11/B	7	06.08.80		
55	BESKA, Bronislaw	Fitter M. Main	11-11/C	9	03.12.80		
56	NOGAJCZYK, Tadeusz	Fitter M. Main	11-11/D	7	06.08.80		
57	JANOSZEK, Edmund	Fitter M. Main	11-11/E	8	02.10.80		
58	DOROSLAWSKI, Mieczys.	Fitter M. Main	11-11/F	14	08.10.81		
59	BRYK, Tadeusz	Fitter M. Main	11-11/G	14	07.10.81		
60	GRODZINSKI, Andrzej	Fitter M. Main	11-11/H	9	03.12.80		
61	KOSMOWSKI, Jan	Fitter M. Main	11-11/K	2	31.08.78	24.06.80	11-11/A
62	KRYSZCZUK, Zbigniew	Fitter M. Main	11-11/	14	07.10.81		
63	SUCHODOLSKI, Ryszard	Fitter M. Main	11-11/A	6	13.03.80	16.07.81	
64	SAJPEL, Roman	Fitter M. Main	11-11/M	2	31.08.78	25.06.81	
65	PLUTA, Kazimierz	Fitter M. Main	11-11/L	9	31.08.78	01.06.81	
66	WRONSKI, Ryszard	Fitter M. Main	11-11/	6	13.03.80	27.11.80	

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67	SZYMANIEC, Jerzy	Fitter M. Main	11-11/I	2	31.08.78	27.11.80	
68	PIESCHKALA, Henryk	Fitter M. Main	11-11/J	2	31.08.78	04.03.80	
69	DRYGIEL, Kazimierz	Fitter M. Main	11-11/B	2	31.08.78	25.04.79	
70	MAKULSKI, Marek	Fitter M. Main	11-11/E	2	31.08.78	25.04.79	
71	CIASTKO, Wlodzimier	Fitter M. Main	11-11/E	2	31.08.78	25.04.79	
72	BIENIAS, Alfred	Fitter M. Main	11-11/G	2	31.08.78	25.04.79	
73	MALUSZAK, Zygmunt	Fitter M. Main	11-11/F	2	31.08.78	25.04.79	
74	CYBULSKI, Kazimierz	Fitter M. Main	11-11/D	2	31.08.78	25.04.79	
75	KANDYBA, Wieslaw	Fitter M. Main	11-11/C	2	31.08.78	25.04.79	
76	BRAUER, Witold	Fitter M. Main	11-11/A	2	31.08.78	12.12.79	
77	KROTKI, Rainhard	Comp. M. Mech.	11-12	13	03.09.81		
78	DMUCH, Wladyslaw	Comp. M. Mech.	11-12	1	31.05.78	15.04.79	
79	BLONSKI, Witold	For. Mech. W/s	11-13	2	31.08.78	21.03.79	
80	RAJDA, Miroslaw	Milling M. Op.	11-14	2	31.08.78	27.11.79	
81	OLSZEWSKI, Stanislaw	Milling M. Op.	11-14			16.07.81	
82	LACHNIK, Romuld	Maint. Elect.	11-16/B	12	06.08.81	16.07.81	
83	OKOS, Jozef	Maint. Elect.	11-16/C	3	14.11.79		
84	DZIENIS, Adam	Maint. Elect.	11-16/D	6	10.04.80		
85	WITKA, Michal	Maint. Elect.	11-16/E	2	31.08.78		
86	KURDZIELEWICZ, Stan.	Maint. Elect.	11-16/F	2	31.08.78		
87	ZIOLKOWSKI, Andrzej	Maint. Elect.	11-16/A	8	26.09.80	24.09.81	
88	KOPIK, Joachim	Maint. Elect.	11-16/A	1	31.05.78	05.06.80	
89	KOCOT, Stefan	Maint. Elect.	11-16/B	1	31.05.78	04.03.80	
90	LANGOZ, Pawel	Maint. Elect.	11-16/H	2	31.08.78	27.11.79	
91	WYSTUP, Jozef	Maint. Elect.	11-16/C	1	31.05.78	15.04.79	
92	SKWARCZEK, Stanislaw	Instrum. Sp.	11-17/B	9	03.12.80		
93	MATYJA, Henryk	Instrum. Sp.	11-17/C	2	31.08.78		
94	DUDA, Zygmunt	Instrum. Sp.	11-17/D	9	04.12.80		
95	GRZEGOCKI, Zygmunt	Instrum. Sp.	11-17/E	4	10.01.80		
96	BOROWIAK, Wladyslaw	Instrum. Sp.	11-17/F	3	16.11.79		
97	PIOTROWSKI, Mieczys.	Instrum. Sp.	11-17/G	12	06.08.81		
98	PULTORAK, Andrzej	Instrum. Sp.	11-17/	12	06.08.81		
99	LAWNICZAK, Michal	Instrum. Sp.	11-17/B	3	15.11.79	19.11.80	

SER NO.	SPECIALISTS NAMES	POST TITLES	BUDGET LINE	GR NO	FIELDING DATE	REPATRIAT. DATE	PREV. LINE
100	PYLA, Henryk	Instrum. Sp.	11-17/D	2	31.08.78	12.06.80	
101	KRAJEWSKI, Tadeusz	Instrum. Sp.	11-17/A	2	31.08.78	24.06.80	
102	WSZOLEK, Tadeusz	Instrum. Sp.	11-17/B	1	31.05.78	26.08.79	
103	JONIEC, Piotr	Instrum. Sp.	11-17/A	1	31.05.78	08.11.79	
104	PUCZYNSKI, Jan	X-Rays Sp.	11-19/	12	06.08.81		
105	SOLTYNSKI, Andrzej	X-Rays Sp.	11-19/A	1	31.05.78	08.11.78	
106	MACKOWIAK, Jerzy	Mech. Engin.	11-20/A	7	06.08.80		
107	SARNOWICZ, Bogdan	Mech. Engin.	11-20/B	7	06.08.80		
108	PANEK, Jerzy	Maint. Fitter	11-21/A	10	26.03.81		
109	FRYSZTAK, Jan	Maint. Fitter	11-21/B	9	03.12.80		
110	KWIATKOWSKI, Andrzej	Maint. Fitter	11-21/	13	03.09.81		
111	ROSIKON, Mieczyslaw	Maint. Fitter	11-21/B	5	17.01.80	17.01.81	
112	KANIA, Waldemar	Maint. Fitter	11-21/A	5	17.01.80	17.01.81	
113	KOZIOL, Michał	Sh. Met. Fit.	11-22/A	13	03.09.81		
114	KONIUSZEWSKI, Zdzis.	Sh. Met. Fit.	11-22/B	13	03.09.81		
115	KULESZA, Henryk	Sh. Met. Fit.	11-22/D	5	17.01.80		
116	KOSTRUBIEC, Eugeniusz	Sh. Met. Fit.	11-22/E	13	03.09.81		
117	PROKOPCZYK, Jozef	Sh. Met. Fit.	11-22/F	5	17.01.80		
118	RUBIS, Jan	Sh. Met. Fit.	11-22/C	5	17.01.80	02.04.81	
119	WRZYSZCZ, Jan	Sh. Met. Fit.	11-22/E	5	17.01.80	17.01.81	
120	WAKIELSKI, Edmund	Sh. Met. Fit.	11-22/A	5	17.01.80	17.01.81	
121	IGNATIUK, Mikalaj	Welder	11-23/A	5	17.01.80		
122	SWIETON, Adam	Welder	11-23/D	8	02.10.80		
123	TRYKSZA, Tadeusz	Welder	11-23/B	5	17.01.80	17.01.81	
124	KULIK, Hubert	Welder	11-23/C	5	17.01.80	21.08.80	
125	DYLEWSKI, Janusz	Elect. Eng.	11-24	4	10.01.80	01.02.81	
126	ZDUNEK, Zbigniew	W/Shop Fitter	11-25/A	5	17.01.80		
127	KRYSTLANCZUK, Zdislaw	W/Shop Fitter	11-25/B	5	17.01.80		
128	MERKLINGER, Wojciech	Inst. El. Eng.	11-26	8	25.09.80		
129	KOPYSTYNSKI, Stan.	Instrum. For.	11-28	7	06.08.80		
130	JUSZCZAK, Mieczysl.	Shift Elect.	11-29/D	4	10.01.80		

SER NO.	SPECIALISTS NAMES	POST TITLES	BUDGET LINE	GR NO	FIELDING DATE	REPATRIAT. DATE	PREV. LINE
131	SLUSARZ, Jozef	Shift Elect.	11-29/F	7	06.08.80		
132	KICZOROWSKI, Adam	Shift Elect.	11-29/	4	10.01.80	16.07.81	
133	MELNAROWICZ, Tadeus	Shift Elect.	11-29/	5	17.01.80	11.06.81	
134	ZIMNICA, Jozef	Shift Elect.	11-29/A	6	13.03.80	28.05.81	
135	SAGADEL, Miroslaw	Shift Elect.	11-29/	4	10.01.80	21.05.81	
136	FIUTOWSKI, Ryszard	Instrum. Sp.	11-30/A	8	25.09.80		
137	BARAN, Stanislaw	Instrum. Sp.	11-30/B	12	06.08.81		
138	POZOGA, Jerzy	Instrum. Sp.	11-30/C	12	06.08.81		
139	CHWASTEK, Eugeniusz	Instrum. Sp.	11-30/D	7	06.08.80		
140	JONCZY, Jerzy	Instrum. Sp.	11-30/	7	06.08.80	06.08.81	
141	CZOK, Walter	Instrum. Sp.	11-30/	4	11.01.80	07.05.81	
142	GRUDZIECKI, Michal	W/Shop L. El.	11-31/A	9	03.12.80		
143	MAZIJ, Ryszard	W/Shop L. El.	11-31/B	11	23.07.81		
144	SWIATKOWSKI, Lech	W/Shop L. El.	11-31/C	12	06.08.81	01.10.81	
145	RABIEJ, Wlademar	W/Shop L. El.	11-31/B	4	10.01.80	17.01.81	
146	JARZABEK, Stanislaw	W/Shop L. El.	11-31/A	4	10.01.80	18.09.80	
147	PLECH, Zbigniew	High T. Elec.	11-32/A	11	23.07.81		
148	DABROWSKI, Boguslaw	High T. Elec.	11-32/B	10	26.03.81		
149	SZYMONEK, Jeneusz	High T. Elec.	11-32/	4	10.01.80	19.02.81	
150	SOBALA, Jerzy	High T. Elec.	11-32/	4	10.01.80	17.01.81	
151	KUSTRA, Wladyslaw	Diesel Mech.	11-33/A	7	06.08.80		
152	KOWALCZYK, Jozef	Lime Burner	11-38/A	7	06.08.80		
153	ZBOINA, Czeslaw	Lime Burner	11-38/B	8	25.09.80		
154	CIFSLIK, Zdzislaw	Lime Burner	11-38/	14	07.10.81		
155	CYBULSKI, Wladyslaw	Lime Burner	11-38/D	5	17.01.80		
156	STANISLAWSKI, Wlad.	Lime Burner	11-38/C	8	25.09.80	02.04.81	



