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*for a sustainable future*

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ONE YEAR'S REPORT  
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METAL INDUSTRY OF  
JAMAICA

TO: Mr. Gustavo Polit,  
Chief, Section for the Americas,  
United Nations Industrial Development Organization,  
Rathausplatz 2,  
P. O. Box 707, Vienna,  
Austria.

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ONE YEAR'S REPORT  
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RESTRICTED

COUNTRY: JAMAICA

OFFICIAL: HANS W. HEIN

PROJECT NO.: JAM- 011 - C - (SIS)

FIELD OF WORK: METAL INDUSTRY

DATE: 3rd DECEMBER, 1970

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INTRODUCTION

1. This Report is a short summing-up of the results of one year of service to the Jamaican industry. After having got to know that my contract has been extended for another four months, I consider it more appropriate to write this interim report and not a final one.
2. I want to express my sincere thanks to all who supported my work and helped me in the first year of my assignment in Jamaica, as there are:
  - The Honourable Minister Lightbourne and Members of the Ministry of Trade and Industry
  - All Members of JIDC - The Executive Director, Secretary, Industrial Promotions Department, Productivity Centre, Economics Department, Library, General Administration
  - The Resident Representative of UNDP and his office Staff
  - The Bureau of Standards
  - My colleagues in the fields of electrical, shoe and leather and chemical industries
  - The German Embassy
  - Representatives of Foreign Firms operating in Jamaica
  - Jamaican industrialists, engineers and businessmen, too numerous to mention them all.
3. Without their help and assistance my mission could hardly have been a support to the local metal and related industries.
4. It may be specially mentioned that there is a very close and fruitful co-operation with my colleague for the electrical and electronic industry - Mr. C. P. Storr. As there are many overlappings in our fields of work - in the technical education of local staff and workers as well as in production

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processes - this good co-operation turned out to be very valuable for quite a number of local industries, and not only in our particular fields of work.

I. WORK DONE

5. During the year, nearly 100 factories and places were visited, to get a survey of the industry related to my field of work. Quite a number of factories were visited repeatedly to give assistance and/or advice they had asked for.

6. The following subjects, proposals and projects were evaluated or commented upon:

- 6.1 Local production of components for electric irons
- 6.2 Production of pre-stressed concrete poles
- 6.3 Manufacture of small twist drills with an offered specialised machine
- 6.4 Aluminium alloys and die casting machines
- 6.5 Moulds for injection moulding machines
- 6.6 Machines and equipment of a steel structure and welding firm for sale
- 6.7 Assembly of floor polishers
- 6.8 Comparison of two factories producing fluorescent lighting fixtures
- 6.9 Enquiries about a loan application of a Kingston firm
- 6.10 Assistance in commissioning laboratory equipment in a liqueur factory
- 6.11 Application to aggravate the import of water purifiers
- 6.12 Work permits for skilled expatriate workers
- 6.13 Better practical education of production engineers and foremen (initiated by and worked out with Mr. C. P. Storr)
- 6.14 Eight proposals for more economical production in the form of sketches or workplan were given to local industrialists
- 6.15 A number of farms were supplied with specific information they had asked for
- 6.16 Repeated advice to a factory owner intending to set up a rolling mill for aluminium sheets
- 6.17 Locally produced staples were said to be of poor quality. By making a number of trials and touring various banana packing plants and visiting other consumers it could be ascertained that imported staples are by no means of better quality. Malfunctioning is always related to poor maintenance of the staplers and/or careless operation of the workers.
- 6.18 A firm intending to produce refrigerators has been repeatedly advised on components which could be produced later on locally and on licence documents. The Jamaica Development Bank has been advised on a loan application of the same firm.

6.19 Similar assistance has been rendered in the local production of gas cooker components. Another firm (under the same management as 6.18) intends to introduce a new cooker in the market.

7. The initial planning of buildings, machines, equipment, tools and measuring instruments for a toolroom in Jamaica has been completed. A sketch of the wanted buildings has been given to the Land and Buildings Department of JIDC and the design is going on.

8. Planning of particular tools like grinding wheels and selection of tool steel, die sets and other materials is still to be done. Grinding wheels can be determined only when the grinding machines are known. Ordering of tool steel and related items in advance is a tricky business because every toolroom engineer or tool designer has his own opinions about materials to be used.

9. Foundation drawings, instructions about electrical connections, etc., can only be given when the machines - brand, type and size - are known.

10. It is hoped that a decision will soon be made about the items which can be supplied by UNIDO assistance. Only then can other items be ordered by the Jamaican Government.

11. During the year, quite a number of proposals have been made how the local industry can be improved. However some of them are very capital intensive and need further investigation. The proposals were:

- 12.1 Components for gas cookers
- 12.2 Plastic and other parts for refrigerators
- 12.3 A variety of components for fencing material
- 12.4 Pole line hardware
- 12.5 Dip galvanized steel window frames
- 12.6 Inner containers for electric water heaters
- 12.7 Insulators for telephone and low voltage electric lines
- 12.8 Not-notched rounds and a few profiles for burglar bars, window frames, verandah furniture, etc. and  $\frac{1}{4}$ " round as semi-finished material for a wire drawing plant
- 12.9 Compression mouldings
- 12.10 Caps for plastic bottles and other plastic items like:  
Feet and stoppers for steel and tubular furniture of all kinds, throw-away ice buckets, picnic plates, cups, etc.
- 12.11 Aluminium and zinc gravity (and, maybe, also pressure) die castings
- 12.12 Telephone cubicles and switchboard components
- 12.13 Local production of a number of cast iron parts which are at present still imported, like building hardware, components for fences and mattresses, etc.

- 12.14 High-grade steel office furniture
- 12.15 Water taps and valves and regulators for gas cylinders
- 12.16 Ship wrecking and scrapping
- 12.17 Agricultural hand tools and simple implements (shovels, spades, rakes, harrows, etc.) which are partly suitable also for road building and landscaping.
- 12.18 Tool and die making and maintenance was mentioned already under paragraphs 7 to 10
- 12.19 Production of wood screws and small screws for telephone, electrical and sheet metal products.

13. Already started or in the stage of discussion are the following products:

- Cubicles and components for telephone switchboards
- Coils and nylon components for telephone exchanges
- Lamination stampings and coils for ballasts of fluorescent tubes.

14. Certain production lines which are either very specialized or backed by foreign companies (or both) can hardly be advised by a metal expert with general experience. Companies of this kind are, for example:

- 14.1 Bauxite mining companies
- 14.2 Alumina plants
- 14.3 The aluminium extrusion plant
- 14.4 The Metal Box Company
- 14.5 The Mirror factory
- 14.6 Carib Pipe factory
- 14.7 Ceramic factory.

15. The sugar industry and sugar factories are served by another UNIDO team, their report being due approximately in March, 1971.

## II. MEETINGS, CONFERENCES AND INTERVIEWS

16. More than 70 conferences, meetings and interviews were attended with various institutions, corporations and persons. Quite a few of these meetings were within JIDC with the Executive Director, the Promotions Department and the Productivity Centre, total 24 occasions either to give or to get information and advice.

17. Eleven discussions were held with the Resident Representative of UNDP and/or Senior Members of the UNDP Staff about various subjects, and nine with the Minister of Trade and Industry, the Hon. Robert C. Lightbourne, or with Members of the Ministry of Trade and Industry.

18. Each of six meetings were attended with various Jamaica Manufacturers Association Committees and the Bureau of Standards, and a number with members

of the German Embassy, the Industrial Vocational Training Programme, the College of Arts, Science and Technology and with local importers of goods, local industrialists and expatriate skilled workers.

19. Some of these meetings or interviews showed unexpectedly good results.

### III. PROBLEMS ENCOUNTERED

20. Most of the Jamaican Industries are seriously hampered by:

- Unreliable electricity supply with frequent break-downs.
- Telephone connections are often out of order, trunk calls of only 12 miles distance are a nightmare.
- One heavy rainshower - traffic is collapsed for hours and sometimes days.
- Male workers are often neither efficient nor reliable.

21. Some factories, especially large ones, are not at all interested in getting advice or help, neither from foreign experts nor the Productivity Centre nor from any other source. They want to make their own arrangements partly at high expenses and not always with promising results.

22. In this connection a work of the late Prime Minister of India, Pandit Nehru, may be cited:

"We want to make our own mistakes and learn from them."

That obviously is true also for parts of the Jamaican industry. It is a hard and expensive way to learn, however, an effective one.

### IV. PRESENT POSITION AND PLANS

23. Within the remaining four months of my assignment, I will try to complete the pre-planning of the toolroom and to collect further information about Jamaica's metal industry.

24. Some books have been ordered considered to be valuable for further pre-planning work of the toolroom.

### V. OTHER RELEVANT INFORMATION

25. Attached to this report are background informations and job descriptions for foreign experts needed for the toolroom. The dates mentioned are not necessarily binding. It may be considered whether UNIDO can render any assistance.

26. The question of counterpart(s) has been settled in a fairly agreeable way. For various subjects and problems the concerned factory owner or manager is to be considered being my counterpart. In dealing with the toolroom pre-planning, e. g., my counterpart is the Minister of Trade and Industry.

H. W. Hein

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## FOREIGN EXPERTS

### Background Information

Jamaica's metal, electrical and plastic working industries grew in recent years faster than anticipated. However, tool and die making, repair services and maintenance of imported machines, special tools, etc. are lagging behind. Many machines are second-hand for which spare parts are not available.

All special equipment, fixtures, punching tools, moulds, etc. have at present to be ordered abroad, involving long delivery times and unavoidable expenditure of foreign exchange. The know-how to produce them locally can only be supplied through a foreign co-operation.

Hundreds of imported expensive tools are out of working condition completely, many others are giving only poor performance, needing re-grinding or replacement of cracked punches or adjustment to available machines. As a result, many machines are standing idle.

The project is intended to be not only a training centre for a toolroom crew but to supply urgently needed special tools, dies, fixtures, render general repair facilities to a variety of workshops and small factories.

These services are not intended to be free of charge, however the profit margin should be very limited, if any. The aim should be to have the centre self-contained after a period of about 5 years. ~~Six~~ Six foreign experts and ~~Six~~ counterparts are foreseen.

The Duty Station will be in Kingston, the capital of Jamaica. Jamaica has some 2 million inhabitants and Kingston,  $\frac{1}{2}$ -million. The climate is moderate tropical. Working language is English. In 1962, Jamaica became independent; she is still, however, closely connected with the British Commonwealth. The monetary system was changed to Decimal Currency on September 8, 1969 (J\$1.00 = 10 shillings or English £1 = J\$2.00).

In 1975, U.K. will change over to the metric measuring system which is at present fairly unknown in Jamaica. The Island will doubtlessly follow this general world trend, hence the foreign experts should be fully conversant with the metric measuring and calculating system, however must have knowledge of the inch system too.

In selecting of experts, emphasis should be laid on broad general experience in various technical fields other than on specialization. All should have experience in dealing with people in a tropical country with another attitude towards labour and manual skills than they have experienced in their home country. All experts should have experience in supervising and training of counterparts and workers.

Background Information (cont'd)

Cost of living and house rents in Kingston are fairly high, however, all amenities, good schools, etc. are available. Parts of the Island are pleasant holiday resorts. An International Driving Licence is recognized by Jamaica. Traffic is at present still on the left side of the roads.

ONE PROJECT MANAGER

University degree or graduated engineer with at least 20 years of experience in tool and die designing and making, in repair and maintenance of a variety of machines and in training of personnel of differing educational background in various technical lines. The Project Manager will be assisted by a counterpart and a number of experts, hence part of his duty will be the co-ordination and streamlining of the work of various departments.

The Project Manager should be capable of heading a toolroom with attached repair section and necessary design and Office Staff of finally about 40 employees and skilled workers and some 20 trainees of various trades and professions. A good knowledge of tool steel is desirable.

He should have practical knowledge in economics and factory organization and should be able to plan the year to year budgeting of the toolroom with attached departments - split into local and foreign expenditure - with assistance of the accountant and other expert members of the team. Knowledge of cost estimation will be an additional advantage.

The Project Manager will be further required to carry out all necessary negotiations with the local authorities - perhaps with the help of the U. N. Resident Representative - as well as the correspondence with the sponsoring U. N. Departments. A sense of leadership and good will of co-operation are really essential for this promising venture which is estimated to last for 5 years. By that time, or even earlier, the counterpart should be in the position to take over full responsibility of the project.

**The project should be joined in August, 1971.**

ONE DESIGN ENGINEER

With at least 20 years of experience in designing of punching dies, special tools, jigs and fixtures, devices. Knowledge of gravity die-casting and moulds for the plastic working industry would be an additional advantage. All-round knowledge and experience will be more valuable than specialization.

The Design Engineer should be capable to attend to the Project Manager's duties in his absence. A thorough knowledge of cost estimation of the jobs to be executed is necessary. Adaptation to local possibilities, performance of workers, local wage rates, cost of materials, overheads, can naturally be learned only at site and necessary data will be provided or are to be elaborated.

Required is the capability to draft and sketch the wanted dies, etc. and to supervise and train a staff of draftsmen and trainees. In the initial stage, draftsmen courses are to be worked out and to be conducted. An Assistant Design Engineer with supplementing experience and counterparts are foreseen for the design office. Training has to be conducted in the metric system.

The Design Engineer could be further requested to represent the Centre and its interests in the Bureau of Standards which has recently been created. This could comprise a field as wide as: materials, metric measuring system, fits and tolerances, cutting tools, drawing practice and others.

In co-operation with the Assistant Design Engineer, the project is scheduled for a period of five years, for the Design Engineer - 3 years, and for the Assistant Design Engineer - 4 years, with a certain time of overlapping. Each should assist the other in duties and responsibilities. When having completed the terms, the counterparts should be fully trained to take over duties and responsibilities.

The project should be joined in September, 1971.

ONE ASSISTANT DESIGN ENGINEER

Should have at least 15 years of experience in design and manufacture of moulds for plastic working industry (extruders, injection and blow moulding and compression moulding machines). Knowledge of die casting moulds and some experience in sheet metal working tools is desirable.

One task of the Assistant Design Engineer will be the production planning and scheduling of devices designed, the follow-up of workshop progress and related jobs. The team of 6 foreign experts have to closely co-operate in fulfilling the various tasks of the project.

Good knowledge of tool steel and materials used in a toolroom is desirable. Drafting of spare parts for broken down machines can be necessary too. Checking of drawings, supervising of draftsmen and conducting of draftsmen training courses are further duties to be performed. Knowledge of commercial cutting tools would be an additional advantage.

The post is foreseen for a period of 4 years, work to be taken up about 9 - 12 months after arrival of the Design Engineer. During the stay in the country, a counterpart should be fully trained to be able to take over all responsibility.

The project should be joined in July, 1972.

ONE FOREMAN FOR REPAIRS

*Must be familiar with the  
repair and maintenance work*

Wanted is a foreman with 15 to 20 years of experience in repair and maintenance of a variety of machines. Must have thorough knowledge of arc and gas welding and brazing. Knowledge of pneumatic and hydraulic equipment will be an advantage.

Together with his counterpart, the Foreman will be mainly responsible for dismantling of machines and for ordering of spare parts, if necessary. These and re-working of wornout parts will be done in the attached well-equipped toolroom. Special care must be given to the assembly and trial runs of the repaired machines. A considerable part of the Foreman's time will be used for supervising the local staff.

He should have the capability to work out lessons and to conduct training courses (assisted by his counterpart) in preventive maintenance of various machines and to instruct the customers about better service to their machines.

Duration of the post is foreseen for 3 years with a total project duration of 5 years with together six foreign experts.

Should join the project in November, 1971.

- 4 -

ONE TOOLROOM FOREMAN

With at least 20 years of experience in all toolroom machines. Should have thorough knowledge of materials used in a toolroom and must be able to supervise and train the machine operators thoroughly, to upgrade their skills, instruct them in blueprint reading, etc.

The re-grinding section for commercial tools like saw blades, milling cutters, twist drills, reamers, will be under his supervision too.

Inspection of components in production, training of a counterpart and instruction of trainees will be additional duties of the Toolroom Foreman. He should start with supervising the installation of machines and after 3 years of service his counterpart should be able to continue his work.

After some 10 months it is foreseen that he will be assisted by a second foreign expert who will be primarily in charge of bench work and hardening. Quite some work consists of repairing of wornout special tools which were previously imported into Jamaica. Another Foreman will be in charge of the repair and maintenance section of the project.

Should join the project in September, 1971.

ONE TOOLROOM FOREMAN

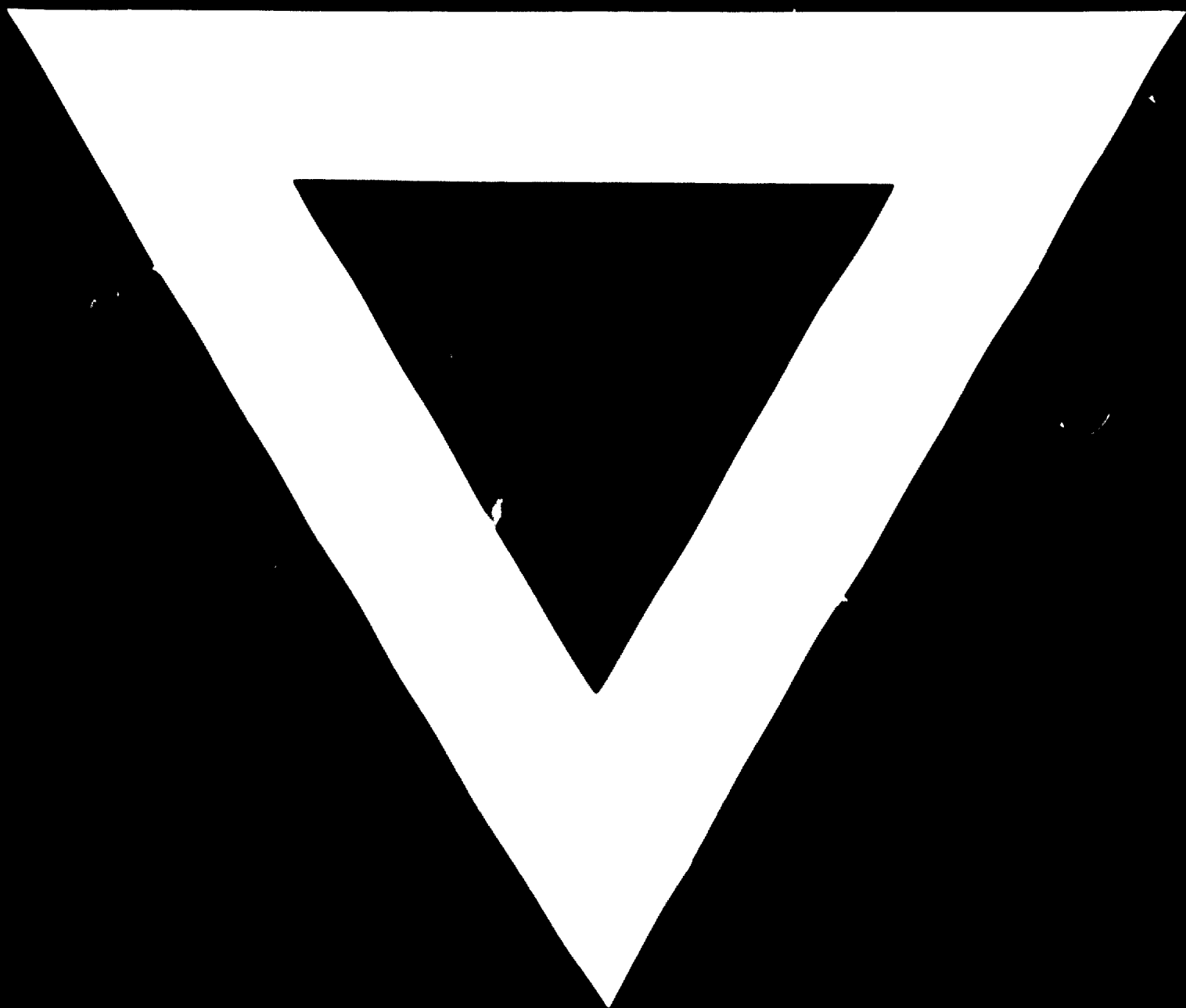
With 15 to 20 years of experience in various lines of toolroom work. His particular tasks will be to supervise and train the toolroom bench worker in reading of blueprints, marking, drilling, tapping, reaming, filing, etc. Further he has to supervise the hardening of components used in tool and die making, hardness testing and related subjects.

It is foreseen that he will stay for 4 years with the project and he should be able to be in charge of the whole toolroom when the other toolroom expert has left the country, respectively he should assist the local counterpart in fulfilling his duties. Some knowledge of electric motors and switchgear would be an additional advantage.

A broad experience will be more appreciated than specialisation and the ability to pass on his own knowledge to a counterpart and the local personnel must be well developed.

Should join the project in July, 1972.





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