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PESTICIDES DEVELOPMENT PROGRAMME IN INDIA

DP/IND/80/037

INDIA

Technical report: Findings and recommendations*

Prepared for the Government of India
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of S. Deri, expert in instrumentation

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Vienna

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SUMMARY

This Technical Report deals with the second mission of the Expert in instrumentation/electronic equipment at the DP/IND/80/037 Pesticides Development Programme India project from 1987/1/15 to 1987/4/14.

Because of the second mission it was possible to judge the progress in instrumentation at the project comparing to the situation of 1985/1/20 when the first mission of the Expert had been terminated. Briefly, the project has implemented the most important proposals suggested by the Expert, and, the instrumentation sponsored by UNIDO has been increased during the last two years.

During the reported period it was held an international scientific seminarium at the project. The Expert took part in it as a lecturer and as a session - Chairman.

The new proposals can be found at the end of this Report.

INTRODUCTION

The DP/IND/80/037 project of Pesticide Development Programme India is a UNDP/UNIDO assisted ongoing project being executed by the Government of India through Hindustan Insecticides Limited (HIL).

The project is placed in the HIL Research and Development Centre at Udyog Vihar, Gurgaon, near the Delhi airport. There are three large buildings there, the first one serves for the chemical laboratories and rooms especially for the project people, the second one contains the Pilot-plant, and the third one gives room for the laboratory of analytical instruments, the library and some R&D laboratories. In the laboratory of analytical instruments one can find the group for the maintenance of scientific instruments and equipment responsible for all such things belonging to the project and to the R&D Centre of HIL.

The first mission of the Expert was motivated by the inspection, installation and commissioning of equipment and instruments in the laboratories and in the pilot plant. The second mission was justified by the same activity regarding to the newly purchased equipment and instruments as well, extended to the repair of equipment out of work and to the training of the local staff for maintenance.

IMPLEMENTED PROPOSALS

During the first mission it was recommended to purchase and install an emergency generator. Now the installed emergency generator is one of the most important equipment at the project.

Regarding the proper timing of instrument purchase and commissioning the proposal said that first the suitable room for the instrument should be prepared. Now for the 5890A Gas Chromotograph and HP 5970B Mass Selective Detector delivered in the near future, the proper room is under preparation.

For safety reasons it was recommended to have fire extinguishers. Now the fire extinguishers are installed.

For the same reason it was mentioned the importance of well constructed safety earthing in the pilot plant. Now the safety earthing is mounted. It was proposed also the correction of the connection of the 'neutral' at the main switch board. Now it is correctly aligned eliminating the danger of fire.

For maintenance it was recommended purchasing hand tools. Now the maintenance group has a complete set of hand tools.

It was proposed in the case of chemical laboratories that the exhausting ventillators should be equipped with lattice shutters to prevent against the ingoing dust. For the most important places the lattice blinds now are assembled.

It was recommended to purchse a general electric type Hydrogen Generator for safety and measurement accuracy reason. Now this equipment is ordered and will be commissioned in the near future.

FINDINGS AND ACTIONS

The instrument and maintenance group consists of Mr. K.L Soni and Mr. G.D. Agarwal. Both of them are very active in the repair and maintenance work.

At the beginning of this mission the emergency generator was checked because of random voltage variations. It became clear that the electronic control unit was faulty. As it is 'Made in India' it was changed for a new one, and the operators of the generator were trained how to adjust the generator. At the same time it was recommended to install three magnetic switches one for each phase, to avoid the overload.

The HPLC was out of work because of the wear out part of the pump. A local company got the commission to repair it supervising by the maintenance group. Now the equipment is in good condition.

The Pye Unicam SP-2000 Infrared Spectrophotometer was out of work and the local agent was not able to repair it because the complete lack of IR source. The equipment was repaired. The heater of the NERNST source was changed at the photometer assembly of the equipment the beam switch motor driver and the pulley was repaired and adjusted properly; the electronic power supply units were checked.

The Perkin Elmer Infrared Spectrophotometer 197 was repaired last year, but at the wavelength of 8 micron it was always stopped. The driver chain was aligned wrong, the mechanical parts were dirty, and wrong aligned. Now it is repaired.

The air-dryer for the IR equipment was installed, now it is in good condition.

Perkin Elmer VISUV spectrophotometer was wrong, as the register was blocked frequently. The sinchronmotor of the registrator was wrong. Now it is mended, but it is recommended to buy a new motor and replace it.

Repaired balances : 4 pcs of Sartorius type analytical balance, 1 pc Mettler electronic balance.

The repair and installation of a water purifier was done.

The HEREUS VOTSH deep freezer was mended. Now it needs a Siemens V-23008-A0002-A-052-220V relay.

The 3-phase compressor at the pilot plant was wrong adjusted. Now Mr. Dutta knows how to adjust it properly.

The Leybold-Hereus Freeze Drying equipment got its lost parts. Unfortunately one of the new Dewar flasks is broken, and it was not possible to have proper vacuum oil. Moreover, for using this equipment it needs a continuous supply of liquid nitrogen. So it is advisable to leave this equipment for training purpose for the maintenance group, supposing that after a while it will be possible to repair and install it. For the normal installation it needs a new Dewar of flask type MARATHON 30 (1,0 bar; -196°C, -1 bar; + 20°C from MESSER GRIESHEIM, GERMANY.

During the period of mission it was held an international seminarium. In the frame of it the Expert delivered two lectures dealing with the effective preventive maintenance of scientific equipment. At one time he was the Chairman of the technical session.

New instruments sponsored by UNIDO at the project:

ERWEKA AR400
Watson-Marlow 502S
Wisa DRG M
Aeromatic Ag
Silverson Lab. Mixer,
Turbula Type T2C,
Dino Mill KDL Spec.
Cole - Parmer stirrer
Labsonic
Sonorex
Brookfield Viscometer.

RECOMMENDATIONS

Until now the project reached significant progress. To be able to continuing this progress it is advisable to take account the following:

1. Without electrical power it is impossible to do any satisfactory work at the project. The public electric supply has very long breaks, some times for the whole day. The importance of the emergency generator is obvious. Unfortunately, the present emergency generator has not enough capacity for the project-work. For this

- it is recommendable to get an other emergency generator of the present type.

Having two similar type of emergency generator the capacity of electric power-supply will be doubled for the most loaded periods, moreover, the redundancy of generators will ensure the continuity of electric power supply in the case of a failure of one generator.

To ensure continuous trouble free running of generators

- it is recommendable to install three magnetic switches, one for each phase, to avoid the damages because of overload.

2. For the Perkin Elmer 55^{9} VIS-UV Spectrophotometer it is recommended to purchase and replace a sinchronmotor with the following datas:

Servomoteur
Type DZ 21 BQ
Excit.36V
Debit 2W
Contr. 18V
á ride 2800 T/m
MAGNETIC SA LIESTAI

The best solution is to order it from the Perkin Elmer firm.

3. The project has two similar type of HEREUS VOTSCH deep freezer but the power relay for the one is out of work. As this relay is a bit over stressed

- it is recommendable to purchase and install 3 pcs of the relay with the following data :

  SIEMENS V23008-A-0002-A052-220V AC

  The best solution is to order them from the SIEMENS firm through their dealer in Delhi.

4. The Du Pont Thermal analyser contains thermo couples which are placed so that very easy they can go wrong. As the project has no spares

- it is recommended to purchase the sample and reference thermocouples 3 sets of Platinum - Platinum/13% Rhodium directly from the Du Pont firm.

5. The laboratories have no special protection against the affects of dust storms which happen frequently in May and June. To protect the sensitive instruments and equipment

- it is recommended to diminish the gaps at the windows and doors; to use proper filtering for the air conditioners; to assembly lattice blinds for all the wall-ventilators. (The best solution would be the use of separated box for each instrument).

6. The maintenance group of the Project needs some tools.

- it is recommended to buy :
  table lamps, magnifier lens; dental mirror, forceps, drill machine (hand moved), drill bits from 1,0 mm to 10 mm (incr.0,1 mm); soldering iron (Weller TCP-1 type for 220V); special screw-driver with the facility of screw fixing.

7. Each laboratory should have its own main-power-switch with easy access, placed near the main-entrance of the laboratory. (In an emergency case it makes possible to switch off the whole laboratory in an instant).

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