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ELECTRONIC AND OPTICAL MAINTENANCE AND REPAIR CENTER

DP/VIE/80/039

VIET NAM

Terminal report*

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

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* This document has not been edited.

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Preface

Being aware of the essential need in maintenance and repair of the existing electronic and optical instruments in the universities, various laboratories/research institutions and hospitals, the Government of Vietnam inserted this programme into its National Development Plan and submitted its request to UNDP to include a project proposal to assist the 'Electronic and Optical Maintenance and Repair Centre' in its Country Programme for 1982/1986.

UNIDO was nominated by the Resident Representative of UNDP Hanoi with his letter of 6 April 1982, to be the Executing Agency of the above-mentioned project.

The Preparatory Assistance Document was approved and forwarded to UNIDO Headquarters on 11 May 1982.

A draft project document was prepared by an expert. Taking into account the UNDP Headquarters' comments and recommendations, a modified version was submitted to UNDP Hanoi on 24 November 1983 for its final review and endorsement.

The project document was finally signed by the three parties on the 11 June 1984 with an approved budget allocation of US$ 1.310.000.- for a three years duration.

The project became operational on the day of the expert's arrival to Hanoi on 26 October 1984.

This document represents the Terminal Report containing its final assessment, findings and recommendations.

C O N T E N T S

I. BACKGROUND

A. OBJECTIVES

The purpose of this project was to raise the efficiency of the scientific research and application of its results to production by promoting the maintenance and repair of electronic and optical equipment to professional standards.

Specifically, the aim of the project was:

1). To strengthen in Hanoi a centre created for the maintenance and repair of electronic and optical equipment and instrumentation in universities, research and development institutes, technical service agencies of the Government, medical services, industrial production units at national level.

2). To train qualified national staff in the techniques required for the repair and maintenance work to be provided by the centre to its client institutions throughout the country.

3). To develop specialized human and technical resources through the provision of expert advisory services to the centre and the organization of training programmes thus also contributing to improving the quality of the services provided by the centre to its client institutions.

4). To improve the durability and guarantee the proper functioning of equipment provided by UNDP technical assistance to other institutions within various projects. being implemented or already completed.

5). To reinforce the constant use of regular preventive maintenance. as the most cost-effective method of ensuring continued. accurate and dependable operation of the equipment concerned. with minimum disruption of industrial or research operations.

B. LOGIC OF THE PROJECT

The serious problems faced by the country in the field of instrument maintenance during the reconstruction period have lead to the inclusion of the programme into the national development orientation.

The rough weather conditions composed of high heat and humidity prevailing most of the time. and a considerable amount of airborne dust have caused a rapid corrosion to the unprotected apparatus. This would soon damage the sensitive components and subsequently leading to a rapid deterioration of the instruments which would soon be be rendered ineffective. To overcome the afore-mentioned problems by means of air conditioning is hampered by frequent and long period break downs of the city power supply. Proposed solution to improve the environment where the instruments are located has failed due to the

scarcity of the means of this country for a required massive investment. Consultant's findings recommended a most realistic short and medium term solution, namely through regular maintenance.

Electronic and optical equipment and instrumentation in Vietnam have been imported from foreign countries such as Europe, Soviet Union, China, and Japan.

The Company for Scientific and Technical Materials Supplies (COSTMAS) has been acting as the sales and after sales services agency of Zeiss Jena and has established a small service workshop, which exclusively carried out maintenance of Zeiss instruments with tools and spare parts supplied by the manufacturer and purchased within the warranty-period service. The efforts undertaken by the company to also render services to other instruments of different makes, however have failed due to the unavailability of the necessary spareparts as well as of the required expertise. These facts have inspired the company to strengthen its capabilities in rendering services to various institutions. UNDP was then requested by the Government to include in its Country Programme for 1982/1986 a technical assistance project in the field of electronic and optical maintenance and repair. These activities were carried out at a centre, which was also known as Instrument Service Centre, established by the Decree No. 144/QD of 21 Dec.1983, issued by the Company. The Centre was thus established to function under the direct supervision of the Company, constituting an autonomous but subordinate entity with a responsibility for maintenance and repair of electronic and optical instruments in use in Vietnam.

II. PROJECT ACTIVITIES

The activities of the project proceeded at a much lower speed than previously set out in the project document and its work plan.

To meet the service demands of the customers, following workshops have been established in the Centre:

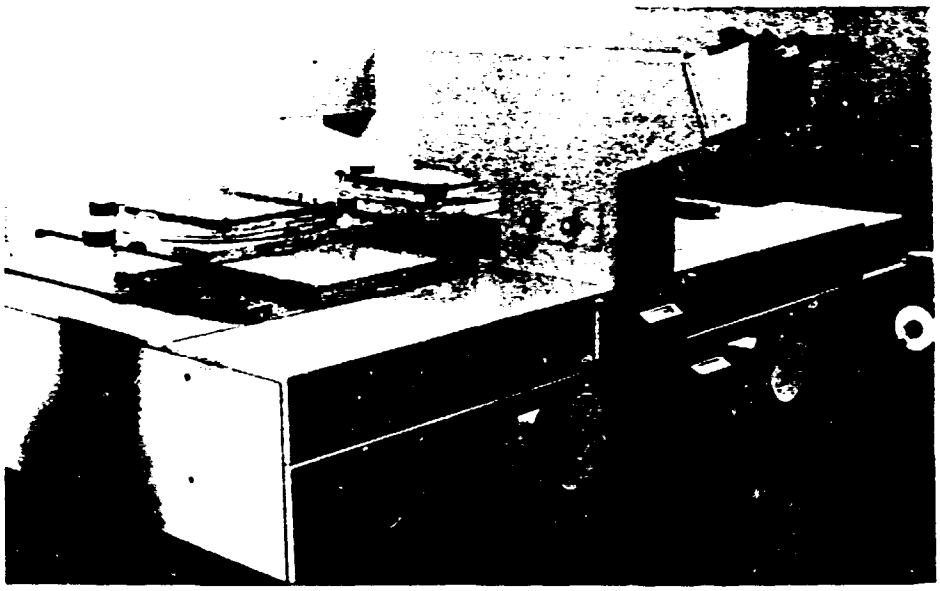
1). Electronic and analytical instrument workshop.

The workshop occupies 80 m2 room on the second floor. Seven technical staff are assigned to run this workshop which is equipped with a wide variety of equipment such as analogue multimeter, digital multimeter, oscilloscope, oscillograph with one and two channels, milli ohmmeter, A.V. milli voltmeter x-y recorder, x-t recorder, digital pH.meter, ion meter, digital flame photometer, spectrophotometer, refractometer, conductivitymeter, I.C tester, transistor tester and some electronic tools.

The workshop renders maintenance and repair services of electronic and analytical instruments belonging to the universities of Vietnam, Hanoi Research Institutes, Son Tay Sugar Factory, Hanh Minh Survey Institute, Da Nang Pharmacological Factory, Da Nang Polytechnic Institute, Geological Survey Institute, and a few UNDP projects. Due to the high sensitivity of these instruments repair and maintenance works can only be done at the customers' premises. For this purpose a mobile workshop is used.

2). Electrical workshop

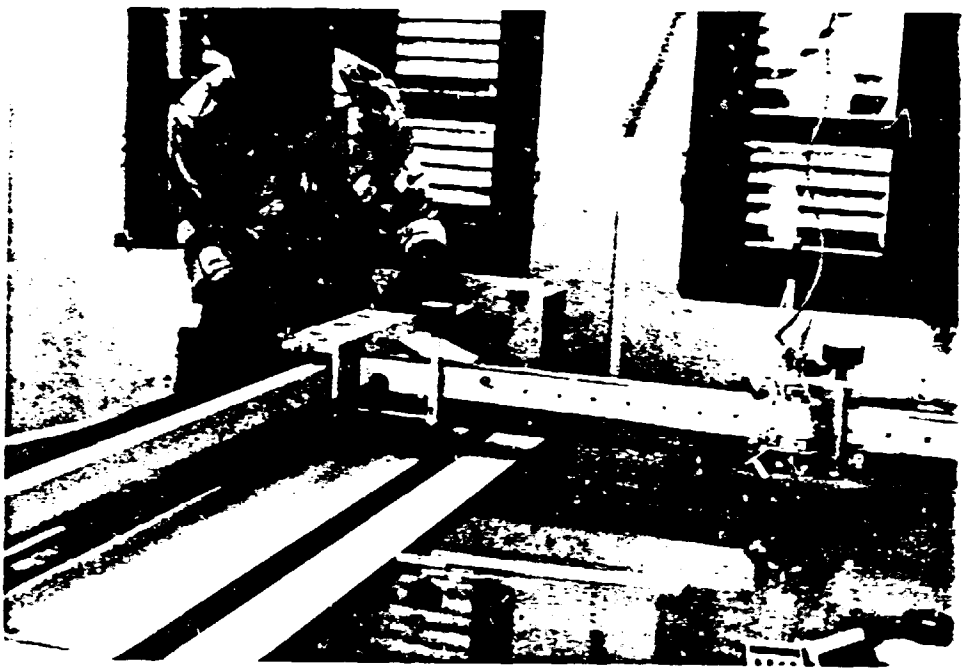
This workshop occupies a space in the groundfloor of the building. Two technical staff run the day to day repair and maintenance works of electrical equipment of the customers, such as electrical ovens, furnaces, other equipment having heating elements, distillation apparatus and coil winders. Their repair activities often involve other staff of the mechanical workshop.



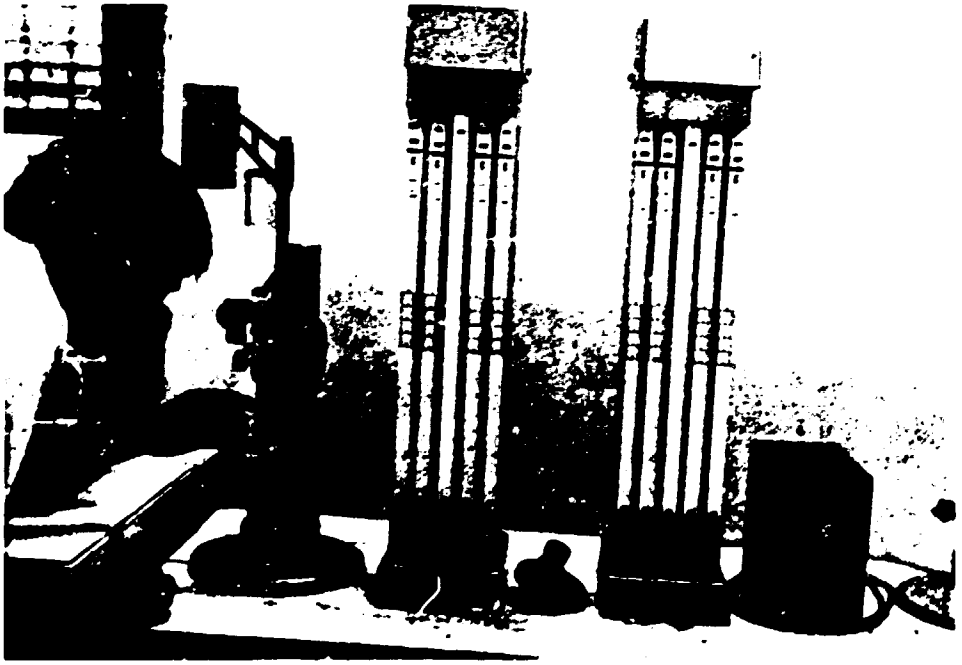
3). Opto-mechanics workshop

The workshop is situated on the second floor of the Centre premises With its 10 technical staff the opto/precision mechanics workshop represents the biggest one in the Centre. Its activities cover the repair and maintenance of survey equipment such as theodolite.(leveling equipment): photogrammetry (topocart, rectimat, plotting table): microscopy (microscope, telescope, mono-and binocular): hospital equipment for opthamology, such as retinophot, dioptrimeter and other specialist equipment: precision mechanics (balances, refractometers hardness tester, coordination grinders).

41. Office equipment workshop

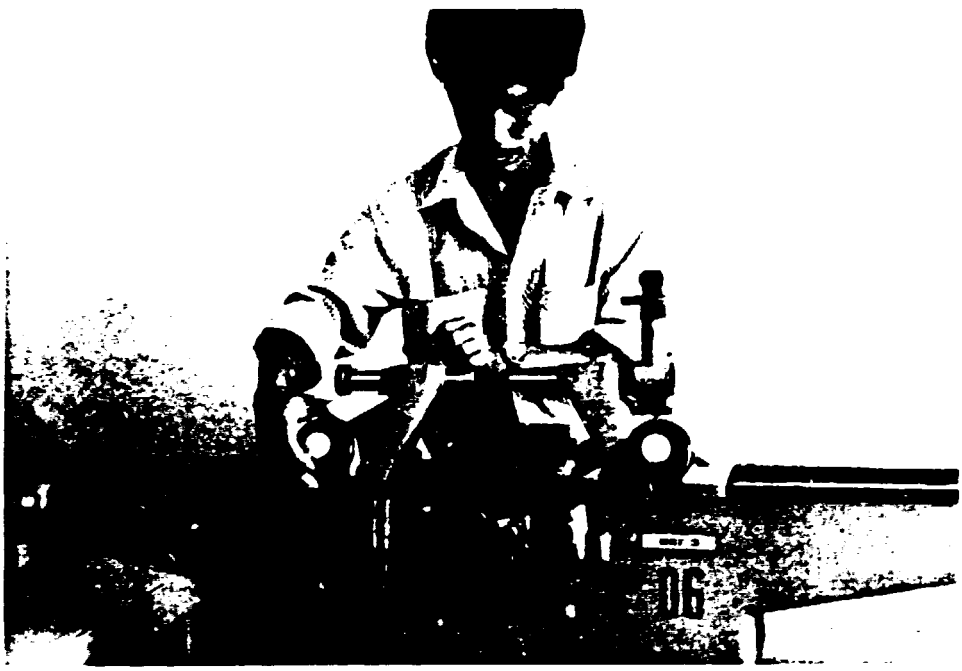


The office equipment workshop is run by two technical staff. Their main job is to repair and to carry out maintenance of photocopiers, duplicators and electrical typewriters belonging to the Government, UN institutions and embassies. The workshop has been equipped with the necessary tools and spare parts.



5). Refrigeration workshop

This workshop provides services to hospitals, food processing factories, Government institutions, UN establishment, embassies and private people. Any equipment employing a compressor, such as refrigerators, hospital bloodbank, deep freezers, cooling chambers, centrifuges and air conditioners, is serviced by four technical staff of this workshop.



6). Glassblowing workshop

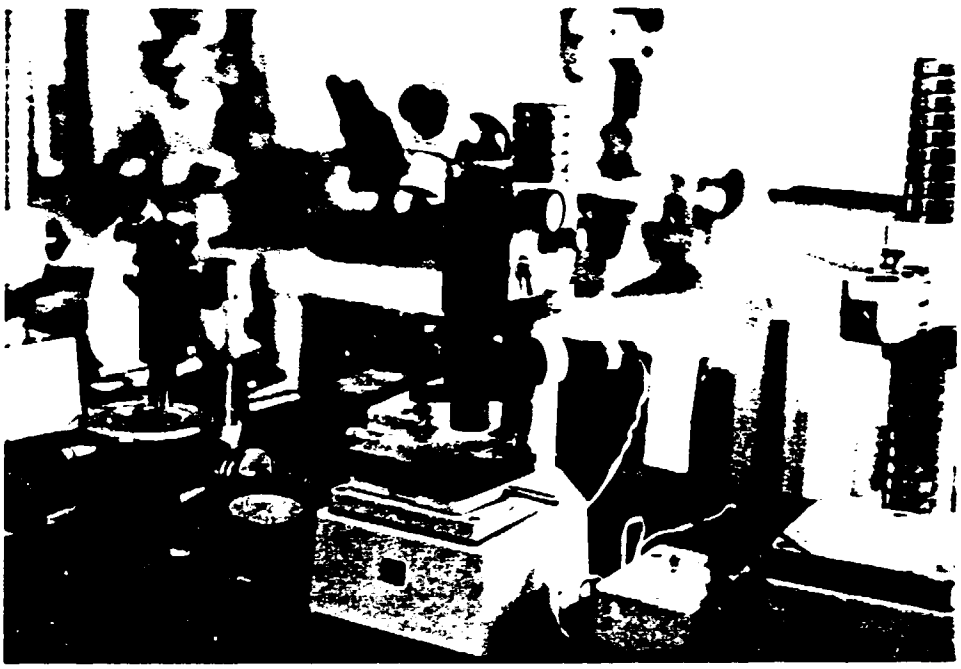
The glassblowing workshop is equipped with necessary equipment which have been imported from the Netherlands and FRG: it is situated in an outbuilding next to the main building of the Centre. It has its own storeroom and workshop. For safety reasons the gas-plant is located outside the building, in a separate shed.The work done by four staff in the glassblowing workshop is of production nature, i.e making test tubes, capillary tubes and connection pieces.

/). Mechanical workshop

The workshop is equipped with usual machine tools such as a lathe, a milling machine, a pillar drill, a spot welder, a socket press, a bench grinder, a power hacksaw, a cutting machine, a bending machine, a sandblasting machine and necessary mechanical acessories; it is run by five technical staff and occupies an 80 m² space, which is an annex to the main building. It is meant to provide a support service to other workshops.

III. ACHIEVEMENT OF THE IMMEDIATE OBJECTIVES

All five immediate objectives of the project have been either fully or partially achieved.



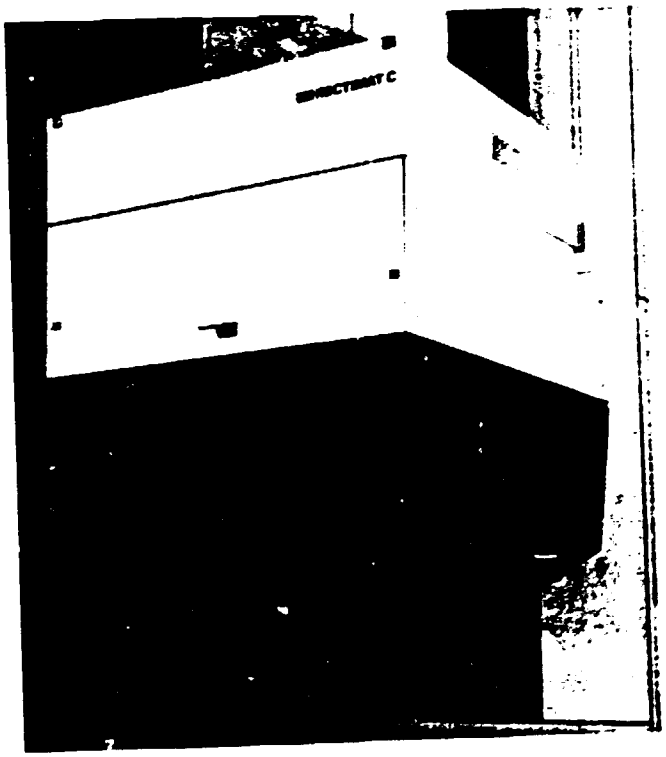
The strengthening of a Centre created by the Company for Scientific and Technical Materials Supplies (COSTMAS) for the maintenance and repair of electronic and optical equipment has been fully carried out in spite of several hindrances caused by the delays of centre's premises construction, fielding of experts, placements of fellows and procurement of equipment due to some licence requirements.

The Electronic and Analytical Workshop has been established, equipped with necessary equipment, qualified technical staff and supported by short term international experts. The workshop is now able to provide maintenance and repair services to various customers.

The Electrical Workshop can rewind damaged motors, rewire heating elements in furnaces or other heating devices as well as manufacture replacement parts for damaged electrical elements.

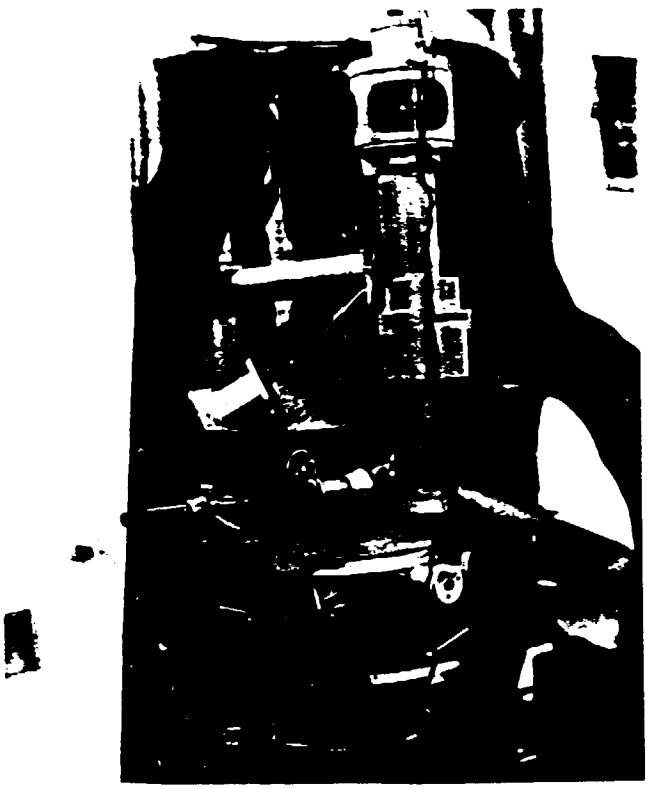
The Opto-mechanics Workshop is able to provide repair and maintenance services to the universities, research institutes, hospitals and quality control units of machine tool factories.

The Office Equipment Workshop provides maintenance and repair services of photocopiers and typewriters to the Government Institutions, UN Agencies and Embassies.



The Refrigeration Workshop is in a position to carry out repair and maintenance works to any type of refrigerators, bloodbank, cooling chambers, deep freezers, centrifuges and air conditioners.

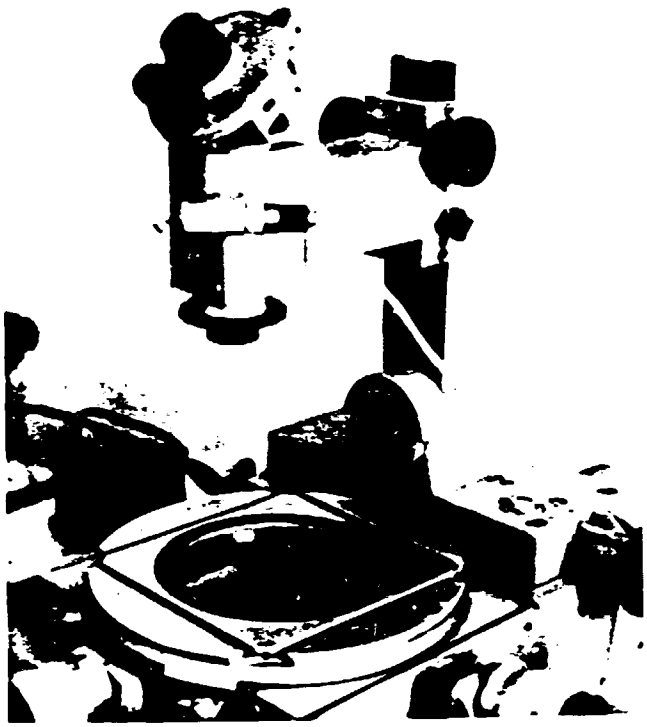
Glassblowing Workshop is equipped with necessary equipment and trained technical staff. It can do the work on soft as well as hard/pyrex glass. Scientific capillary tubes, test tubes and connection pieces are manufactured by this workshop to replace damaged parts. Complicated glass drilling and angle cutting are done in this workshop.



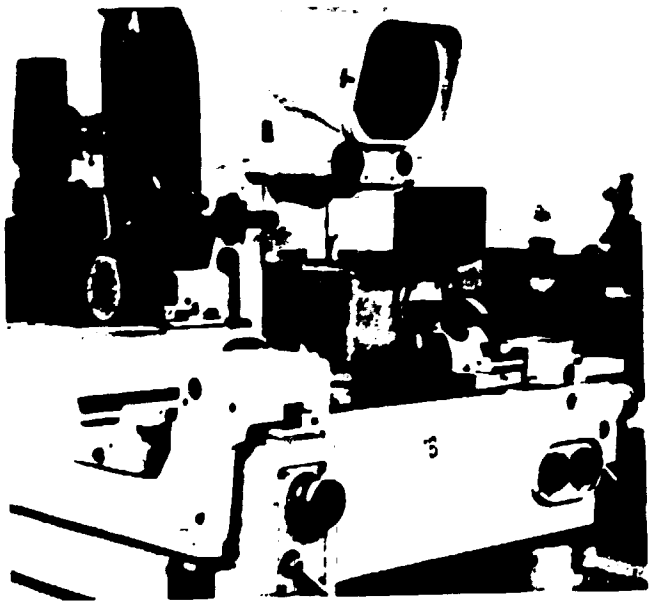
The Mechanical Workshop, established by the Centre to provide support services to other workshops, is well-equipped with usual machine tools, which are required to fulfill its job.

Seven foreign experts, namely A. Henderson (CTA), S.K. Suri (CTA), L. Drummond (mechanical engineering), H. Gardner (refrigeration engineering), H. Ebneter (opto-mechanics), A. Zwart (glassblowing), J. Blair (electronic and analytical instrument engineering) have been fielded to support the development of human/technical resources and to contribute to improving the quality of their services to the customers.

Twentyfour technical staff have been trained abroad in different fields of engineering activities. They represent the backbone of the Centre.



Items 4 and 5 of the immediate objectives have only been partially achieved or are in their initial stages. The improvement of the durability and the guarantee of the proper functioning of Government Institutions equipment have been satisfactorily achieved. But the service works for equipment provided by UNDP projects have only been partially implemented.



IV. PROJECT RESULTS UNTILIZATION

The project under final review has shown several positive results. The establishment of seven workshops in the Centre are now being utilized by the technical staff as means to render maintenance and repair services the following customers:

University of Hanoi.

Polytechnic Institute Hanoi.

Polytechnic Institute Da Nang.

Hanoi Research Institute.

Cartography Institute Hanoi.

Quang Ninh Geology Institute.

Metrology Institute Hanoi.

Several hospitals in Hanoi.

Ninh Binh Hospital.

Haiphong Medical Institute.

Thai Nguyan Central Hospital.

Pharmacological Testing Station Da Nang.

Pharmacological Testing Station Hahn Nam

Union of Pharmacological Factories Quangson.

Pharmacological Factory Da Nang.

Moc Chau Plantations

Binh Tri Thien Survey Company.

Son Tay Sugar Factory.

Han Minh Food Factory.

Textile Factory Hanoi.

Cement Factory Da Nang.

Survey and Design Institute Than Hoa.

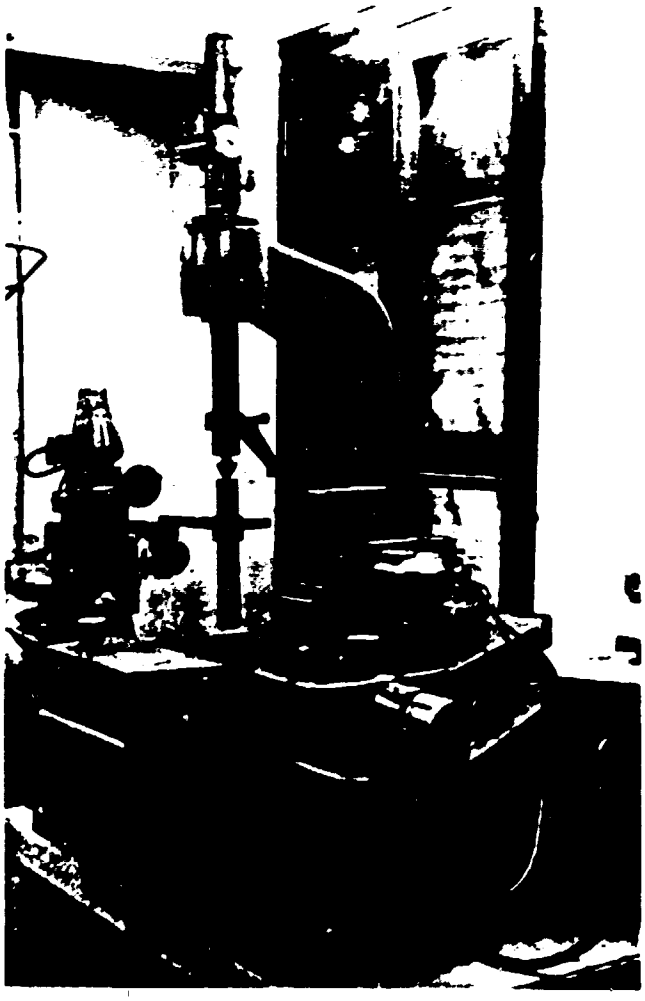
Survey Institute Hanh Minh.

Embassies of Belgium, Egypt, France, Hungary and the Netherlands.

FAO, UNDP, UNFPA, UNHCR.

The record of annual services activities which shows an amount of 1.000 different items to be repaired by the Centre, indicates a positive utilization of the project's results.

The amount of correspondence received by the Management of the Centre inquiring about or requesting the services of the workshop is indicative of the usefulness of this establishment. The Centre is helping the target institutions both inside Hanoi and the surroundings.



V. ASSESSMENT OF THE PROJECT

1). Organization, management and administration

The Centre has 50 staff, consisting of a Director, two Deputy Directors, 34 Technical Personnel and 13 General Service Staff. The Centre Director Mr. Nguyen Van Tinh reports to COSTMAS. The Heads of the Workshops as well as the General Service Staff report directly to the Director of the Centre.

The two Deputies:

Mr. Phan Manh Duc is responsible for technical matters and customer relations.

Mr. Nguyen Tuong Doanh is in charge of the Centre's administration and finance. He is also managing the General Service Division which is composed of the following personnel:

three Accountants

two Personnel Service Staff

one Purchasing Staff

two Storekeepers

one Driver

three Security Guards

The Technical Staff are well-trained and capable personnel.

2). Finance

From the start of the operation of the project the Centre has been able to run the business and to cover the salaries of its staff, the purchase of locally available spare parts from its annual revenue.

Excerpt of accounting report:

Time	Total revenue in Dong	Materials	Salaries and Investment
1986	443.527	195.585	247.942
1987	2.678.992	1.426.541	1.261.451
1988	8.003.510	3.739.083	4.264.427
1989	54.019.034	29.323.270	24.695.746

Judging from the above accounting report and the financial status of the Centre, it can be reported here that the Centre has started to gain a profit out of its service activities. The profit goes to the Government who has invested a building, human resource and equipment in the Centre, and a small percentage is used for modest reinvestment.

The Centre maintains its own bank account in local as well as in foreign currency in the National Bank of Hanoi. It should be mentioned at this point that the foreign currency account comes from the sales invoiced in foreign currency to international or foreign organizations (UNDP, UN Agencies and Embassies).
The financial management follows the usual practice of accounting system in Vietnam.

3).Manpower

The manpower control is directly made by each head of the workshop, who is supposed to know where his people are (on outside duty, on leave or somewhere in the Centre's premises).
The time spent to do a job and the materials/spare parts used

for this purpose are registered on the job sheet

4). Customer relation

The customer's relations follow the usual practice of COSTMAS, namely through an annual customers' meeting. Heads of Government's technical branches, scientific and research institutions are invited to this meeting. Every head of the Centre's workshop will meet and discuss problems and define the needs of the customers for the coming year. A maintenance and repair time schedule is then prepared by both parties. This system is good only for Government Institutions, but it is not a usual practice for rendering services to individual/private enterprises.

The Centre's premises were ready in September 1987; two years behind schedule. The building is located at Tu Liem Street, km 7, on the way to the International Airport of Hanoi. The permanent building of the Centre has four floors. It shows some deficiencies which have been repeatedly pointed out by the previous experts. The only major hazard, which is still to be repaired, is the electricity installation which is apparently a usual practice in the country. But to meet an average standard of a workshop a proper electrical installation should be done for the sake of the Centre's technical staff's safety.

Instead of required controlled air condition, an usual one plus dehumidifiers have been provided without adjusting the windows and doors to a certain degree of air tightness; this makes the air control and dust prevention illusory: the outside heat and dust penetrate through all those openings, resulting in the low repair quality of very sensitive instruments.

VI. CONCLUSION

The project under review has completed its main task, namely to strengthen in Hanoi a Centre established by COSTMAS to render maintenance and repair services of electronic and optical equipment as defined in its charter. The Centre is well equipped with up-to-date and adequate tools and instruments. The Centre has qualified human resources.24 technical staff have been trained abroad in the field of electronics,opto-mechanics, fine mechanics, mechanical engineering, cooling system and glassblowing techniques. Recently the Centre also did installation work of newly purchased scientific equipment such as Topocart D. It has built up a group of faithful customers and has even started making profit out of its activities. From this point of view the Centre should be able to stay on its own feet and to sustain itself.

The previous consultants have recommended to strengthen the management, organization, accounting system as well as technical knowledge in order to provide a better control of manpower, work efficiency and overall results. An assistance in the above-mentioned field will be still necessary.

The delay of the project was mainly caused by:

- the construction of the project building which originally planned in Tu Liem for August 1985 drifted continuously and was completed only in September 1987;
- the change of Chief Technical Adviser and the frequent postponement of experts' fielding;
- problems encountered in placement of fellows;

- licence procedures for some restricted equipment to be procured;
- frequent change of National Project Director and supervision of the project at Government level.

Having carefully assessed the project, following conclusion could be drawn:

Upon the termination of the UNDP/UNIDO technical assistance the Electronic and Optical Maintenance and Repair Centre will be capable to render services to its customers as stated in the objectives of the project document. It is expected that as its staff continuously gain more practical experience, it will be able to increase its efficiency and its self-reliance in handling sophisticated equipment; thus, the Centre will be sustainable.

VII. RECOMMENDATIONS

The Project Document has clearly stated that the duration of the project should be three years, namely from 1984 to 1987. Three times extensions due to the project's delays have been granted, i.e. in 1988, 1989 and in the current year.

Taking the above facts into account it is therefore recommended that:

1). Upon return of the last two fellows who are still on training abroad, procurement of the last batch of equipment and final tripartite review meeting which will be convened in November 1990, this project should be declared operationally completed;

2). The non-expendable equipment should be properly checked; equipment which has fallen in disuse should be transferred to another institution which in continuous co-operation with the Centre would accrue considerable advantage; as example it should be that the glassblowing equipment, such as small gas-plant, small compressor, oxygen bottles, burners, handtools, gas-generator, small drilling machine, small saw machine, small grinding machine graduating machine, annealing machine, breakoff machine, universal precision dividing machine and strain detector which fall into this category should be accommodated within the project DP/VIE/80/030 'Pilot plant for scientific glass products', to achieve concerted and better results both for the customers and the country and to avoid unnecessary duplication which is not in line with cost effective and rentability consideration of both the Centre and the Pilot plant. The above-proposed transfer should be discussed and

agreed by both National Project Directors and by the supervising Government Authority, in this case the Ministry of Commerce; and the decision should be taken by the Government before the implementation of the official hand-over of the title of equipment to the Government, which will be effected after the final tripartite review meeting on this project;

3). To guarantee continuous running of the Centre and to fulfill its purpose as Instrument Service Centre, it should establish a stock of general purpose spares which are utilized by different instruments served by the Centre and which are frequently needed;

4). The campaign to attract not only Governmental Technical/Scientific but also UNDP Institutions and private sector customers should be intensivied;

5). To achieve self-reliance and to maintain sustainability the cost-effective method should be applied in the management and in the service activities;

6). In order to ensure a good quality maintenance and repair of precision and sensitive instruments the workshops should be kept clean and dustfree. A regular cleaning of the workshop and its machine tools after every working shift should be practiced;

7). The outside appearance of the Centre premises should be bright and clean; the entrance to the Centre should be kept open to attract private sector customers.

VIII. ANNEXES

A). EXTRACTS OF EXPERTS' TECHNICAL REPORTS:

1). Arthur S. Henderson, C.T.A.

He came to Vietnam in November 1984 to implement the start-up phase of the project DP/VIE/80/039.

His major occupation was to agree with the project management on the list of equipment that could be used in the existing premises, and to supply spare parts and consumable materials that would reinforce and expand their on-going repair and maintenance operation in Trang Tien.

Advance planning of Tu Liem building has not materialized for administrative reasons. It was essential that the project management and the responsible departments of the Government get together to see that the Tu Liem building on hand-over should be ready for occupation by the Centre. This means power supplies of the right type in the right place, water supplies, drainage etc. Not to forget the holes for the airconditioners.

The despatch of 10 or 12 trainees has been delayed by internal administrative procedures. April 1985 was already passing, and unless the nomination forms were sent to UNIDO in the very near future, it was doubtful whether any trainees would be able to leave Vietnam that year. It should be noted that normal placement procedures take about six months; for the rather special requirements called for by this project, this time might even be extended. Budget provisions existed, but it was doubted if they would be utilized.

Long postal delays (20 - 30 days round trip by pouch) hampered the communication with UNIDO/UNDP Headquarter; it delayed the provision of catalogues and price lists on which equipment requisition are based.

The major short-fall on the Government side has been the complete lack of progress in the construction of the new premises.
The project management, in their contracts with clients, have rightly demanded correct working conditions for installed equipment which they have to service. It would be unacceptable for the conditions in the repair - maintenance Centre to be inferior to those demanded by clients.
After six months, the start-up phase was more or less completed; some equipment and spare parts have been received, and a great deal more was due for delivery by May/June 1985. This should enable the existing output from the Centre's staff in Trang Tien to improve in both quantity and quality, and to commence in-house training in the electronics and fine mechanics areas. Project transport was also on the way, and this should expedite mobile servicing as well as equipment transport from Centre to clients.

2). Lewis M. Drummond, expert in mechanical engineering

The purpose of his mission was :
To train local staff in precision measuring and in the use of measuring instruments.
To train local staff in the operation, routine maintenance and repair of the workshop's machine comprised as follows: lathe, milling machine, bench drill, spot welder, sheet metal bender, guillotine and other tools.
To install, commission, test and put into operation the machines and other workshop equipment.
To provide recommendations and specifications for the procurement of materials tooling, measuring instruments and machine tools inputs as required by the project.

Findings:

Machine tools.

The expert would draw attention to the fact that the inputs presently in situ can not facilitate the manufacture of the components as required to achieve the project objectives The capability of the equipment can not match the accuracy fundamental to optical engineering. At present, achievable accuracy is at best 0.05 mm. The actual requirement is 0.01 mm or better. To achieve this, substantial inputs are needed. The list of required hardware was attached to this report. In addition to the need for accuracy it is required to machine materials harder than RC.40 with surface finishes of 0.1 um. Analysis of the components indicates a cylindrical grinding capability, internal and external is required. The substantial outlay to date on milling cutters indicates the need for a tool and cutter grinder. The physical effort of cutting large diameter bar stock and flat plate can be relieved by the use of mechanical saw.

Measuring instruments.

The micrometers in the workshop at present can not provide sufficient coverage for the range and complexity of measurements to be encountered in the workshop. Other inputs are required to enable effective capability. The list of additional hardware inputs was attached. Corrosion is evident on the micrometers and setting pieces are missing.

Spare parts.

To ensure the continued use of the machine tools it is recommended to obtain sufficient spare parts.

Production control.

An unstructural approach is apparent and again recommendations are given.

Safety.

There is a lack of awareness by the Centre's staff to the dangers present in the workshop.

General observations.

The workshop area of approximately 100 m2 is ample. There is also provision for expansion should the need occur. The area is well lit, ventilated and in close proximity to the main building of the Centre.

Tu Liem is an area of high humidity which has already affected the equipment on site. Steps to combat this problem are required.

The workshop staff are willing workers, keen to learn and have adequate basic training. Actual working experience is required to update skill level.

It should be noted that the equipment on site is not in keeping with the stated project objectives. More sophisticated inputs are required to achieve a positive result.

The selected hardware inputs are all available ex-stock Singapore, thus savings on freight, and rapid delivery are assured.

Recommendations

Measuring instruments.

Humidity has already caused damage to the micrometers in the workshop; steps must be taken to prevent similar damage to the other hardwares yet to arrive. Air conditioning of the workshop would be the correct solution; should this not be possible, protective coatings of

petroleum jelly oe similar medium must be applied to these measuring instruments. It is also advised that these precision instruments be kept in an airtight cabinet with ample vapour process corrosion inhibitors and/or dehumidifiers.

Calibration of these instruments must be carried out prior to use and records kept to confirm this fact.

Maintenance.

A maintenance schedule has been prepared utilizing the manufacturers recommendations with a simple colour code to guide the workshop staff in the frequency of application. Staff have been instructed in this field and are carrying out the daily lubrication schedule. The period before any major overhaul is required can be as as ten years, provided the scheduled is followed. There will most likely be minor repairs prior to this and it is wise to prepare for such eventualities.

Pesonnel.

The skill requirement level for the type of component and range of activities expected from the workshop is very high. Staff have not had sufficient exposure to the demands will be placed upon them. Training and actual production experience are required to raise their skill levels. Staff are eager to learn and appear to have the capability of running the workshop. Should the difficulties encountered over fellowship placement be unresolved, it is recommended that the services of a skilled toolmaker/instrument maker be obtained for a period of six months or more. Engineering drawing skills are also required and staff must acquire this skill. The need to produce components from heat treated materials is evident. To allow for this the consultant has specified grade 01 oil hardening tool steel. The processes required are

within the capability of staff to acquire knowledge of.

General notes.

Dust covers are to be provided for all of the machine tools. Corrosion inhibitors are to be placed under the dust covers at all times. Storage cabinets are to be provided for the inputs of cutters, measuring instruments, other hardwares and materials.
Machine spares are to be placed in clearly marked containers and protected from the possibility of corrosion. Letters are to be sent to the manufacturers of spot welder and drilling machines requesting operating and spares manuals: upon receipt of these manuals orders of spare parts must be placed.

3). Harry Gardner, expert in refrigeration and airconditioning

The aim of this mission as negotiated with UNIDO were:
To assist in establishing and strengthening of the refrigeration and airconditioning equipment maintenance and repair workshop.
To provide technical guidance on procedures of repair and maintenance of various kinds of refrigeration equipment including deep freezers.
To train local counterpart staff on the subject by giving lectures and providing job training.
To prepare specifications for complementary equipment, teaching aids and spare parts which might be needed for future operation of the shop.

Activities:

It appeared that the service work consisted of a work load of 20% domestic refrigerators, 40% airconditioners, 20% deep freeze cabinets and remaining 20% special application associated to laboratory cooling equipment.

Lectures were to be given starting at the beginning if any head way was to be achieved. This was found to be necessary due to the lack of know-how in physics which were allied to thermodynamics appertaining to the industry.

Due to the lack of spare parts it was found very difficult to explain the method how an item operates.

The job training was carried out through repair and maintenance visits to the customers.

The first visit was made to the Foodstuff Research Institute, Hanoi. Repair service was demonstrated to the technical staff on low temperature vacuum freeze drier. The problem with the compressor was solved.

The visit to Bach Mai Hospital concentrated in the maintenance of blood bank which had again a faulty compressor. Repair was carried out on the spot. Due to the lack of spare parts, we have decided to make one blood bank serviceable by using the best parts from other cabinets which was not functioning.

It is to be noted that all these equipments were not designed for operation in the tropical country with high ambient condition.

The visit to the library which was at the final stages of the construction involved us into solvi g a problem of airconditioners to be installed in the premisses. Inatallation plan was drawn, calculation of energy consumption was made and recommendation was given to the library management.

Recommendations:

The greatest danger in the workshop was the poor standard of the electrical installations. Standard code of practice layed down by the Electricity Authority should be followed.

Every piece of electrical machine tool should be bonded to the earth by separate wire having an alligator type clip. This precaution was required as none of the electrical socket outlets were provided with earth connection.

Electric welding workshop would be used primarily for electric arc welding. When welding by arc is in operation the outside shutters should be closed to minimize arc penetration.

Workshop should be kept clean and dustfree.

4). Helmut Ebneter, Opto-mechanics engineering expert

The aim of the mission was:

To assist in establishing maintenance and repair workshop for opto-mechanics equipment, particularly photogrammetry and survey instruments.

To provide necessary theoretical knowledge and on-the-job training to the national staff.

To give technical guidance in the workshop organization/management.

Activities:

The Institute for Agricultural Planning and Projection has a Department of Topography, which is responsible for producing topographic maps of an area of 11.45 mio. Ha. at a scale of 1:5000 and 1:10.000. Sofar 1.5 mio. Ha are mapped. This means that it would take 50 years to complete the job, if all of the instruments (topocart, plotter, rectimat) are in good working condition.

The space for this Department is old but clean and tidy. No person is allowed to enter with shoes. The airconditioner is not working properly therefore it allows the grow of fungus on the optics.

The electrical wiring is of poor standard; frequent black-outs have

caused damages to the electronic components.

The following instruments are under maintenance and repair contract with the Centre:

Wild A10 with plotting table PZT13. co-ordinate register device eK22. IBM-713 type writer. Facit tapepunch.

Wild A8 with P2T 13. orthophoto attachment PP08. co-ordinate register device EK IBM-713 typewriter.

Wild B8S with pantograph.

Wild PUG 4 point transfer device

Zeiss Jena Topocard with plotting table.

The instruments were installed in 1975: no service has been carried out since then. Fungus has attacked all optical parts and destroyed partly the coated surfaces. Mirror cardans. gliding bearings have dried out and become stiff. Rails, space rods and ball bearings are rusty. Electrical and electronic components are corroded and damaged. Picture illuminations are damaged beyond repair.

These equipment were used as demonstration aids to the national staff on how they should proceed with the maintenance and repair.

The only recommendation is: the Institute should provide adequate air-conditioning, in order to prevent the grow of fungus. The room temperature should be kept at the maximum of 25 C and maximum humidity 64%.

ANNEX B: LIST OF EQUIPMENT

(Final property control list will be provided by UNDP Vietnam)

Project Number

DP/VIE/80/039

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
NON-EXPENDABLE PROPERTY CONTROL RECORD

Period Ending :

Country : VIETNAM

Project Title : ELECTRONIC AND OPTICAL MAINTENANCE AND REPAIR CENTRE

Purchase Order Number	Item No.	Description	Qty. Ord.	US Dollar Equivalent	Received Qty.	Received M	Received Y	Cond.	Qty On Hand	Remarks
15-5-00252	1	STOREBRO COMBI MILL MILLING MACHINE, COMPLETE.	1	19,004.00	1	12	85			
15-5-00292	1	TOYOTA HIACE COMMUTER 12-SEATER W/C.A.C. COOLER.	1	5,968.00	1	06	85			
		CHASSIS NUMBER ===> YH50B-0027323 ENGINE NUMBER ====> 2Y-0245561 REGISTRATION NO. => NN 2940								
15-5-00292	2	TOYOTA HILUX PICKUP W/C.A.C. COOLER.	1	3,959.00	1	06	85			
		CHASSIS NUMBER ===> YN50-0041613 ENGINE NUMBER ====> 1Y-0121037 REGISTRATION NO. => NN 2939								
15-5-00292	3	TOYOTA COROLLA 1300 STATION WAGON DX W/C.A.C. COOLER.	1	3,877.00	1	06	85			
		CHASSIS NUMBER ===> KE70-6203712 ENGINE NUMBER ====> 4K-6541801 REGISTRATION NO. => NN 2938								
15-5-01528	1	WESTINGHOUSE MODEL AH-125 ROOM AIRCONDITIONER.	10	4,170.00	10	02	86			
15-5-01528	2	HONDA MODEL EG550E AC/DC GENERATORS.	2	854.00	2	02	86			
15-5-01528	3	HONDA MODEL EM-2200XR GENERATOR.	1	878.00	1	02	86			
15-5-01528	4	HONDA MODEL EM-3000R GENERATORS.	2	2,274.00	2	02	86			
15-5-01529	1	100MHZ 8 TRACE OSCILLOSCOPE VP-5512A.	1	1,894.00	1	10	86			

Project Number : DP/VIE/80/039

Country : VIETNAM

Purchase Order Number	Item No.	Description	Qty. Ord.	US Dollar Equivalent	Received Qty.	Received M	Received Y	Cond.	Qty On Hand	Remarks
15-5-01529	2	200MHZ 2 TRACE OSCILLOSCOPE VP-5520B.	1	4,710.00	1	10	86			
15-5-01529	3	15MHZ 2 TRACE OSCILLOSCOPE VP-5216A.	1	458.00	1	10	86			
15-5-01529	4	R.C. OSCILLATOR VP-7212A.	1	3,606.00	1	10	86			
15-5-01529	5	FUNCTION GENERATOR VP-7402A.	1	1,422.00	1	10	86			
15-5-01529	6	SWEEP GENERATOR VP-8813B.	1	1,655.00	1	10	86			
15-5-01529	7	AC VOLTMETER VP-9640A.	1	451.00	1	10	86			
15-5-01529	8	ANALOG VOLTMETER VP-916A.	2	1,200.00	2	10	86			
15-5-01529	9	DIGITAL MILLI OHM METER VP-2941A.	2	1,939.00	2	10	86			
15-5-01565	1	PORTABLE STROBOSCOPE (MAINS) PM9113/00.	1	2,796.00	1	10	86			
15-5-01565	2	59MHZ DTB SCOPE INCL. BATT. PM3217/80.	1	2,483.00	1	10	86			
15-5-01565	3	PULSE GENERATOR PM 5712.	2	3,974.00	2	10	86			
15-5-01565	4	COUNTER PM6654/01.	1	3,970.00	1	10	86			
15-5-01565	5	OSC. TROLLEY PM8991/01.	1	543.00	1	10	86			
15-5-01565	6	DC CURRENT PROBE PM9101/01.	2	1,043.00	2	10	86			
15-5-01565	7	OSCILLOSCOPE TROLLEY PM8991/01.	1	543.00	1	10	86			
15-5-01565	8	DIGITAL MULTIMETER PM2518X/11, SERIAL NOS. 02583-02584-03657.	3	1,213.00	3	10	86			

Project Number : DP/VIE/80/039

Country : VIETNAM

Purchase Order Number	Item No.	Description	Qty. Ord.	US Dollar Equivalent	Received Qty.	Received M	Received Y	Cond.	Qty On Hand	Remarks
15-5-01565	9	LINEAR VHF PROBE PM9211/01.	1	522.00	1	10	86			
15-5-01565	10	MEMORY ADAPTER PM9140/01.	2	757.00	2	10	86			ONE LOST AT PORT, INSURANCE CLAIM/REPLACEMENT SHIPPED 3/88
15-5-01565	11	IEC-BUS INTERFACE FOR PM2528 PM9291/02.	1	778.00	1	10	86			
15-5-01565	12	BCD OUTPUT FOR PM2528 PM9292/02.	1	543.00	1	10	86			
15-5-01565	13	LOGIC MULTIMETER PM2544/01, SERIAL NOS. 01541-01546.	2	3,783.00	2	10	86			
15-5-01565	14	ELECTRONIC MULTIMETER PM2504, SERIAL NOS. 05555-05603.	2	1,704.00	2	10	86			
15-5-01565	15	DIGITAL MULTIMETER PM2528/02, SERIAL NO. 02889.	1	2,952.00	1	10	86			
15-5-01565	16	50MHZ DTB SCOPE DQ 05-1074 PM3217B.	1	2,483.00	1	10	86			
15-5-01565	17	60MHZ DIG. STOR. IEEE-488 PM3315/001, SERIAL NO. DQ01-932.	1	11,043.00	1	10	86			
15-5-01565	18	X-Y RECORDER A4 STANDARD PM8043/01, SERIAL NOS. 01370-01371.	2	4,443.00	2	10	86			
15-5-01565	19	MINI RECORDER 2-8 CM/HR PM8110/22, SERIAL NOS. 04103-04104.	2	1,800.00	2	10	86			
15-5-01565	20	AC STABILIZER 1 KVA 200V PE1610/01, SERIAL NOS. WB1020, 1019.	2	5,670.00	2	10	86			

Project Number : DP/VIE/80/039

Country : VIETNAM

Purchase Order Number	Item No.	Description	Qty. Ord.	US Dollar Equivalent	Received Qty.	Received M	Received Y	Cond.	Qty On Hand	Remarks
15-5-01565	21	DC POWER SUPPLY PE1642/00.	2	3,591.00	2	10	86			
15-5-01565	22	CVT 1,5 KDA END USER PE1414/201, SERIAL NOS. WB2467, 2470.	2	1,443.00	2	10	86			
15-5-01565A	1	PHILIPS MEMORY ADAPTER 9447 091 40011 PM 9140/01.	1	463.00						
15-6-00478	1	REGULATED SPECTRONIC 20 SPECTROPHOTOMETER 33-31-72.	1	1,282.00	1	11	86			
15-6-00478	2	SPECTRONIC STANDARDS 333150.	1	501.00	1	11	86			
15-6-00478	3	MODEL SA520 BENCH TOP PH/MV TEMPERATURE METER COMPLETE.	1	711.00	1	11	86			
15-6-00478	4	LABORATORY CONDUCTIVITY METER MODEL LI521.	1	703.00	1	11	86			
15-6-00478	5	PIRANI PENNING 1005 07-D386-32-000.	1	1,083.00	1	11	86			
15-6-00478	6	ELVI 655/CA DIGITAL FLAME PHOTOMETER COMPL. WITH ELVI 755 COMPRESSOR.	1	3,624.00	1	11	86			
15-6-00478	7	HYGROGRAPH NO. 1.0612.00.000.	1	482.00	1	11	86			
15-6-00478	8	SARTORIUS LABORATORY ELECTRONIC PRECISION BALANCE MODEL L 420 S.	1	1,396.00	1	11	86			
15-6-00478	9	ADJUSTING WEIGHTS MODEL 6712-00.	1	447.00	1	11	86			
15-6-00809	1	SMALL UNIVERSAL PRECISION DIVIDING MACHINE WITH STANDARD ACCESSORIES.	1	2,869.00						

Project Number : DP/VIE/80/039

Country : VIETNAM

Purchase Order Number	Item No.	Description	Qty. Ord.	US Dollar Equivalent	Received Qty.	Received M	Received Y	Cond.	Qty On Hand	Remarks
15-6-00809	2	DIAMOND HIGH SPEED DRILLING MACHINE WITH STANDARD ACCESSORIES.	1	2,626.00						
15-6-00809	3	FULLY AUTOMATIC STATIONARY COMPRESSOR.	1	2,306.00						
15-6-00809	4	UNIVERSAL GLASS CUTTING MACHINE WITH STANDARD ACCESSORIES.	1	3,897.00						
15-6-01190	1	KIRCHOFF BUNSEN SPECTROSCOPE WITH 16CM DIAMETER.	1	918.00						
15-6-01190	2	BINOCULAR MICROSCOPE, OBJECTIVES 10, 40, 100 MAGNIFICATION EYE PIECE PAIR 10 MAGNIFICATIONS WITH 6V - 10W ILLUMINATION.	1	2,088.00						
15-6-01190	3	ANGLE TESTING INSTRUMENT FOR GRADUATED CIRCLES WITH 4 COLLIMATORS.	1	20,703.00						
15-6-01190	4	TOP LOADING ELECTRO-OPTICAL BALANCE WITH DIGITAL DISPLAY.	1	1,484.00						
15-6-01190	5	UNIVERSAL REFRACTOMETER (ABBE TYPE) RANGE 1,3 TO 1,7.	1	3,022.00						
15-6-01190	6	ARMEALING FURNACE, 1150 DEGREES CENTIGRADE WITH ELECTRONIC CONTROL.	1	2,088.00						
15-6-01190	7	MOBILE VACUUM PUMPING UNIT, ULTIMATE VACUUM 10-4 TORR SUCTION CAPACITY.	1	4,126.00						
15-6-01190	8	MOBILE VACUUM PUMPING UNIT, ULTIMATE VACUUM 10-6 TORR SUCTION CAPACITY.	1	5,000.00						

Project Number : DP/VIE/80/039

Country : VIETNAM

Purchase Order Number	Item No.	Description	Qty. Ord.	US Dollar Equivalent	Received Qty.	Received M	Received Y	Cond.	Qty On Hand	Remarks
15-6-01190	9	ROTARY VANE SINGLE STAGE OIL PUMP ULTIMATE VACUUM 1 MILLIBAR.	1	599.00						
15-6-01190	10	ROTARY VANE DOUBLE STAGE OIL PUMP ULTIMATE VACUUM 10-3 MILLIBAR.	1	1,401.00						
15-6-01190	11	HIGH VACUUM PIRANI GAUGE RANGE 0,011 MILLIBAR TO 100 MILLIBAR.	2	1,714.00						
15-6-01190	12	DIGITAL VACUUM METER, RANGE 1 MILLIBAR TO 1300 MILLIBAR.	2	1,929.00						
15-6-01190	13	COMPRESSION VACUUM METER RANGE 80 TO 0,001 MILLIBAR.	2	1,458.00						
15-6-01190	14	HYGROGRAPH WITH DAILY RECORDER SPRING CLOCKWORK AND CHARTS.	1	473.00						
15-6-01190	15	CONSTANT TEMPERATURE COMBINED BRIDGE THERMOSTAT NO. 177-410.	5	2,967.00						
15-6-01190	16	CONSTANT TEMPERATURE COMBINED BRIDGE THERMOSTAT NO. 177-420.	5	4,027.00						
15-6-01190	17	TEMPERATURE INDICATORS NO. 266-505.	10	4,049.00						
15-6-01190	18	TEMPERATURE INDICATORS NO. 266-667.	10	4,286.00						

Project Number : DP/VIE/80/039

Country : VIETNAM

Purchase Order Number	Item No.	Description	Qty. Ord.	US Dollar Equivalent	Received Qty.	Received M	Received Y	Cond.	Qty On Hand	Remarks
15-6-01254	1	TOYOTA LANDCRUISER STATION WAGON WITH THIRD SEAT MODEL FJ62LV-KCZ. CHASSIS NUMBER ===> FJ62-066854 ENGINE NUMBER ====> 3F-0131722 REGISTRATION NO. => ???	1	14,329.00						
15-6-01535	1	EMCO TS-5 TABLE MOUNTED CIRCULAR SAW.	1	421.00						
15-6-01535	2	MODEL SD310 STARTRITE COMBINED PLANER AND THICKNESSER MACHINE, COMPLETE.	1	1,936.00						
15-6-01535	3	MODEL SP.7 DISC SANDER, COMPLETE.	1	463.00						
15-6-01535	4	CHIP HOOD WITH EXTRACTOR FAN.	1	618.00						
15-6-01535	5	KOKKO 70A COMPLETE SET OF BALL BEARING EXTRACTORS.	2	937.00						
15-6-01535	6	87 PIECE GAUGE BLOCK.	1	848.00						
15-6-01535	7	130MM CENTRE HEIGHT FULL UNIVERSAL DIVIDING HEAD COMPLETE WITH ACCESSORIES.	1	1,602.00						
15-6-01535	8	P1001 ELECTRONIC BENCH DRILL.	2	1,785.00						
15-6-01535	9	MODEL 34 BR/6 PEDDINGHAUS COMBINED PUNCH AND SHEAR.	2	1,091.00						
15-6-01535	10	SCISSORS TYPE MOBILE LIFTING TABLE.	2	2,645.00						
15-6-01535	11	VENEERED CHIPBOARD TOOL CUPBOARD 2100MM.	2	990.00						

Project Number : DP/VIE/80/039

Country : VIETNAM

Purchase Order Number	Item No.	Description	Qty. Ord.	US Dollar Equivalent	Received Qty.	M	Y	Cond.	Qty On Hand	Remarks
15-7-00756	1	THREE-JEW-CHUCK 125MM.	1	487.00						
15-7-00756	2	HORIZONTAL PLANE GRINDING MACHINE "LABORATORY MODEL", COMPLETE.	1	3,413.00						
15-7-00756	3	ANGLE GRINDING ATTACHMENT.	1	637.00						
15-7-00756	4	ANGULAR DRILLING ATTACHMENT.	1	404.00						
15-7-00756	5	VISE FOR DRILLING MACHINE.	1	921.00						
15-9-C0601	1	SPECIAL EXECUTION FOR DRILLING MACHINE NO. 561/01: WELDED BASE AND BUILT-IN THREE-CHAMBER WATER CASCADE WITH HIGH PRESSURE WATER PUMP, INDIVIDUALREGULATION OF PRESSURE GAUGE.	0	1,168.00						
25-0-03785	1	FLOOR FAN, SANYO/JAPAN.	5	450.00	5	08	85			F.P.O. 003785
25-0-05048	1	BESELER PORTA SCRIBE G100 OVERHEAD PROJECTOR.	1	312.00	1	02	85			F.P.O. 005048
25-0-05048	2	DALITE DELUXE B WALL SCREEN, LENTICULAR 60 X 60.	1	89.00	1	02	85			F.P.O. 005048
25-0-05052	1	FACIT 1740 MANUAL OFFICE TYPEWRITER 49CM.	1	372.00	1	02	85			F.P.O. 005052
25-0-05052	2	OLYMPIA CARRINA II PORTABLE TYPEWRITER 31CM CARRIAGE, ENGLISH KEYBOARD.	1	115.00	1	02	85			F.P.O. 005052
25-0-05052	3	RICOH MODEL FT-3020 PHOTOCOPIER.	1	1,752.00	1	02	85			F.P.O. 005052

Project Number : DP/VIE/80/039

Country : VIETNAM

Purchase Order Number	Item No.	Description	Qty. Ord.	US Dollar Equivalent	Received Qty.	Received M	Received Y	Cond.	Qty On Hand	Remarks
25-0-05052	4	SHARP MODEL EL1601 DESK CALCULATOR WITH PRINTER.	1	32.00	1	02	85			F.P.O. 005052
25-0-05052	5	AMBASSADOR MODEL 600 SHREDDER.	1	507.00	1	02	85			F.P.O. 005052
25-0-05052	6	OKAMURA MODEL 4417KE STEEL FILING CABINET, 4 DRAWERS.	2	308.00	2	02	85			F.P.O. 005052
25-0-05052	7	OKAMURA MODEL 4912KE (12) VISIBLE RECORDERS.	2	514.00	2	02	85			F.P.O. 005052
25-0-05683	1	STANDARD ELECTRICALLY DRIVEN GAS GENERATOR.	1	1,373.00						F.P.O. 005683
25-0-05683	2	PORTABLE AUTOMATIC ELECTRICALLY DRIVEN GAS GENERATOR.	1	941.00						F.P.O. 005683
25-0-05686	1	REX ROTARY MODEL RR-400 MANUAL OPERATED STENCIL DUPLICATOR.	1	798.00						F.P.O. 005686
25-0-05687	1	AUTOMATIC MULTIPLE COIL WINDING MACHINE MARK II, 220V/50HZ.	1	950.00						F.P.O. 005687
25-0-05688	1	OSK 6615 PH CHECKER.	1	770.00						F.P.O. 005688
25-0-05688	2	OSK 3503 TRANSISTOR TESTER.	1	616.00						F.P.O. 005688
25-0-05688	3	OSK 3504 DIGITAL IC TESTER, TYPE A BENCH MODEL.	1	1,493.00						F.P.O. 005688
25-0-05688	4	OSK 6694 DIGITAL IC TESTER.	1	733.00						F.P.O. 005688
25-0-05688	5	OSK 3505 OP AMP TESTER.	1	782.00						F.P.O. 005688
25-0-06103	1	SANDBLAST BOOTH.	1	963.00	1	12	85			F.P.O. 006103

Project Number : DP/VIE/80/039

Country : VIETNAM

Purchase Order Number	Item No.	Description	Qty. Ord.	US Dollar Equivalent	Received Qty.	Received M	Received Y	Cond.	Qty On Hand	Remarks
25-0-06103	2	TRANSFORMER 220/110.	1	99.00	1	12	85			F.P.O. 006103
25-0-06103	3	VAPOUR DEGREASING M/C 230V.	1	669.00	1	12	85			F.P.O. 006103
25-0-06104	1	AIR CLEANER, 230V, WOOD-GRAIN CABINET.	2	709.00	2	12	85			F.P.O. 006104
25-0-06104	2	ULTRASONIC CLEANER WITH TIMER.	2	864.00	2	12	85			F.P.O. 006104
25-0-06104	3	AUTOTRANSFORMER CAPACITY 500 WATTS.	2	178.00	2	12	85			F.P.O. 006104
25-0-06104	4	HYDRAULIC LIFT TRUCK WITH REMOVABLE FORKS.	1	1,316.00	1	12	85			F.P.O. 006104
25-0-06105	1	CHARGING STATION COMPLETE 220V, 50HZ, INCLUDING SENTRY GAUGE.	2	3,045.00	2	12	85			F.P.O. 006105
25-0-06105	2	PORTABLE PAINT SPRAY OUTFIT FOR 220V.	1	1,050.00	1	12	85			F.P.O. 006105
25-0-06106	1	10/039 SUPER 7B 3.1/2" X 19" QUICK CHANGE LATHE COMPLETE WITH STANDARD EQUIPMENT.	1	1,418.00	1	10	85			F.P.O. 006106
25-0-06108	1	REX ROTARY MODEL RR-22 ELECTRIC OPERATED SPIRIT DUPLICATOR.	1	710.00	1	03	85			F.P.O. 006108
25-0-06109	1	MANUAL TYPEWRITER "ROBOTRON" MODEL 20/67 CM KEYBOARD, VIETNAM TYPESTYLE.	1	252.00	1	05	85			F.P.O. 006109
25-0-06850	1	STAVOL MODEL SVC3000N VOLTAGE REGULATOR.	1	458.00	1	02	85			F.P.O. 006850
25-0-06850	2	AUTO STEP-DOWN TRANSFORMERS 220/110V.	2	162.00	2	02	85			F.P.O. 006850
25-0-06851	1	MAX MODEL GL95CS DRAFTING MACHINE SET: MODEL PM915GL2 TRACKER.	1	261.00	1	02	85			F.P.O. 006851

Project Number :

DP/VIE/80/039

Country :

VIETNAM

Purchase Order Number	Item No.	Description	Qty. Ord.	US Dollar Equivalent	Received Qty.	Received M	Received Y	Cond.	Qty On Hand	Remarks
25-0-06851	2	MODEL MD-A45 DRAFTING STAND.	1	468.00	1	02	85			F.P.O. 006851
25-0-06851	3	MODEL MB-915 DRAFTING BOARD MAGNETIC WITH ACCESSORIES.	1	151.00	1	02	85			F.P.O. 006851

Project Number	UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION NON-EXPENDABLE PROPERTY CONTROL RECORD	Period Ending : Date of transfer
DP/VIE/80/039		

Country : VIETNAM

Project Title : ELECTRONIC AND OPTICAL MAINTENANCE AND REPAIR CENTRE

We certify that the quantities of non-expendable equipment received, less the quantities of non-expendable equipment written-off, reflect the physical count of the items on hand at the date of transfer. Custodial responsibility of the listed items is accepted herewith.

Resident representative _____ Date _____
signature

Government counterpart _____ Date _____
signature

ANNEX C: FINANCIAL STATUS AS AT END MARCH 1991

(The financial completion report will be submitted separately)

RUN-DATE 1991-04-05
UNIDO - UMAP02/B

DETAIL REPORT ON PROJECTS AS AT 1991-03-31
BY PROGRAM ELEMENT AND COUNTRY

PROJECT NUMBER: DP/VIE/80/039

PROJECT TITLE ELECTRONIC AND OPTICAL MAINTENANCE AND REPAIR CENTRE

PROJECT REVISION 8
PROJECT STATUS C - OPER COMPL
PGM-ELEMENT CODE J13313
FIRST ISSUED 82-08-15 LAST UPDATED 91-03-20

BUDGET LINE	DESCRIPT	TOTAL ALLOTMENT		CURR YR PHASING		PRIOR YEAR EXP.		CURR YR DISB.		BAL CURR YR OBL		COMMITTED FUTURE YEARS	BALANCE CURR YR	UNCOMMITTED BALANCE
		M/M (1)	DOLLARS (2)	M/M (3)	DOLLARS (4)	M/M (5)	DOLLARS (6)	M/M (7)	DOLLARS (8)	M/M (9)	DOLLARS (10)	(11)	(12) (4-8-10)	(13) (2-6-8-10-11)
31-19		0.0	0	0.0	0	0.0	6898	0.0	0	0.0	0	0	0	6,898-
31-20		0.0	0	0.0	0	0.0	12865	0.0	0	0.0	0	0	0	12,865-
31-21		0.0	0	0.0	0	0.0	4734	0.0	0	0.0	0	0	0	4,734-
31-22		0.0	0	0.0	0	0.0	8981	0.0	0	0.0	0	0	0	8,981-
31-23		0.0	0	0.0	0	0.0	7834	0.0	58	0.0	0	0	58-	7,892-
31-24		0.0	0	0.0	0	0.0	7714	0.0	0	0.0	0	0	0	7,714-
31-99	FELLOWS	0.0	215,285	0.0	0	0.0	218519	0.0	118	0.0	0	0	118-	3,360-
32-00		0.0	22,675	0.0	0	0.0	0	0.0	0	0.0	0	0	0	22,675
32-01		0.0	0	0.0	0	0.0	22675	0.0	0	0.0	0	0	0	22,675-
32-99	STUDYTOUR	0.0	22,675	0.0	0	0.0	22675	0.0	0	0.0	0	0	0	0
33-00		0.0	2,000	0.0	0	0.0	0	0.0	0	0.0	0	0	0	2,000
33-01		0.0	0	0.0	0	0.0	2000	0.0	0	0.0	0	0	0	2,000-
33-99	INSERVICE	0.0	2,000	0.0	0	0.0	2000	0.0	0	0.0	0	0	0	0
38-00		0.0	21,219-	0.0	0	0.0	0	0.0	0	0.0	0	0	0	21,219-
38-01		0.0	0	0.0	0	0.0	19096-	0.0	0	0.0	0	0	0	19,096
38-02		0.0	0	0.0	0	0.0	2104-	0.0	0	0.0	0	0	0	2,104
38-03		0.0	0	0.0	0	0.0	65-	0.0	0	0.0	0	0	0	65
38-99	SUR PY OB	0.0	21,219-	0.0	0	0.0	21265-	0.0	0	0.0	0	0	0	46
39-99	TRAINING	0.0	218,741	0.0	0	0.0	221929	0.0	118	0.0	0	0	118-	3,304-
41-00		0.0	1,510	0.0	0	0.0	0	0.0	0	0.0	0	0	0	1,510
41-10		0.0	0	0.0	0	0.0	855	0.0	0	0.0	0	0	0	855-
41-12		0.0	0	0.0	0	0.0	655	0.0	0	0.0	0	0	0	655-
41-99	EXPENDABL	0.0	1,510	0.0	0	0.0	1510	0.0	0	0.0	0	0	0	0
42-00		0.0	714,891	0.0	0	0.0	0	0.0	0	0.0	0	0	0	714,891
42-01		0.0	0	0.0	0	0.0	695124	0.0	0	0.0	0	0	0	695,124-
42-99	NONEXPEND	0.0	714,891	0.0	0	0.0	695124	0.0	0	0.0	0	0	0	19,767
48-00		0.0	58,389-	0.0	0	0.0	0	0.0	0	0.0	0	0	0	58,389-
48-01		0.0	0	0.0	0	0.0	345-	0.0	0	0.0	0	0	0	345
48-02		0.0	0	0.0	0	0.0	58834-	0.0	0	0.0	0	0	0	58,834
48-99	SUR PY OB	0.0	58,389-	0.0	0	0.0	59179-	0.0	0	0.0	0	0	0	780
49-99	EQUIPMENT	0.0	658,012	0.0	0	0.0	837455	0.0	0	0.0	0	0	0	20,557
51-00		0.0	14,880	0.0	0	0.0	0	0.0	0	0.0	0	0	0	14,880
51-10		0.0	0	0.0	0	0.0	2538	0.0	0	0.0	0	0	0	2,538-
51-11		0.0	0	0.0	0	0.0	438	0.0	0	0.0	0	0	0	438-
51-21		0.0	0	0.0	0	0.0	218	0.0	0	0.0	0	0	0	218-
51-22		0.0	0	0.0	0	0.0	18	0.0	0	0.0	0	0	0	18-
51-40		0.0	0	0.0	0	0.0	8694	0.0	0	0.0	0	0	0	8,694-

RUN-DATE 1991-04-05
UNIDO - UMAP02/B

DETAIL REPORT ON PROJECTS AS AT 1991-03-31
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PROJECT TITLE ELECTRONIC AND OPTICAL MAINTENANCE AND REPAIR CENTRE

PROJECT REVISION S
PROJECT STATUS C - OPER COMPL
PGM-ELEMENT CODE J13313
FIRST ISSUED 82-06-15 LAST UPDATED 91-03-20

BUDGET LINE	DESCRIPT	TOTAL ALLOTMENT M/M (1)	TOTAL ALLOTMENT DOLLARS (2)	CURR YR PHASING M/M (3)	CURR YR PHASING DOLLARS (4)	PRIOR YEAR EXP M/M (5)	PRIOR YEAR EXP DOLLARS (6)	CURR YR DISB M/M (7)	CURR YR DISB DOLLARS (8)	BAL CURR YR OBL M/M (9)	BAL CURR YR OBL DOLLARS (10)	COMMITTED FUTURE YEARS (11)	BALANCE CURR YR (12) (4-8-10)	UNCOMMITTED BALANCE (13) (2-6-8-10-11)
11-01		1.5	7,658	0.0	0	1.5	7658	0.0	0	0.0	0	0	0	0
11-02		38.7	270,631	0.0	0	38.7	270630	0.0	0	0.0	0	0	0	1
11-50		9.9	110,271	0.0	0	0.0	0	0.0	0	0.0	0	0	0	110,271
11-51		0.0	0	0.0	0	2.0	22921	0.0	0	0.0	0	0	0	22,921-
11-52		0.0	0	0.0	0	2.0	17501	0.0	0	0.0	0	0	0	17,501-
11-53		0.0	0	0.0	0	0.6	8993	0.0	0	0.0	0	0	0	8,993-
11-55		0.0	0	0.0	0	3.1	44865	0.0	0	0.0	0	0	0	44,865-
11-57		0.0	0	0.0	0	2.2	16191	0.0	0	0.0	0	0	0	16,191-
11-99	**INTEXPERT**	**48.1**	**388,560**	**0.0**	**0**	**48.1**	**388559**	**0.0**	**0**	**0.0**	**0**	**0**	**0**	**1**
15-00		0.0	8,936	0.0	0	0.0	0	0.0	0	0.0	0	0	0	8,936
15-01		0.0	0	0.0	0	0.0	8935	0.0	0	0.0	0	0	0	8,935-
15-99	**TRAVEL**	**0.0**	**8,936**	**0.0**	**0**	**0.0**	**8936**	**0.0**	**0**	**0.0**	**0**	**0**	**0**	**1**
16-00		0.0	32,464	0.0	0	0.0	0	0.0	0	0.0	0	0	0	32,464
16-11		0.0	0	0.0	0	0.0	13795	0.0	0	0.0	0	0	0	13,795-
16-12		0.0	0	0.0	0	0.0	4758	0.0	0	0.0	0	0	0	4,758-
16-31		0.0	0	0.0	0	0.0	13369	0.0	0	0.0	0	0	0	13,369-
16-99	**OTHERPERS**	**0.0**	**32,464**	**0.0**	**0**	**0.0**	**31922**	**0.0**	**0**	**0.0**	**0**	**0**	**0**	**542**
18-00		0.0	5,014-	0.0	0	0.0	0	0.0	0	0.0	0	0	0	5,014-
18-01		0.0	0	0.0	0	0.0	5397-	0.0	0	0.0	0	0	0	5,397
18-05		0.0	0	0.0	0	0.0	1017-	0.0	0	0.0	0	0	0	1,017
18-99	**SUR PY 08**	**0.0**	**5,014-**	**0.0**	**0**	**0.0**	**6414-**	**0.0**	**0**	**0.0**	**0**	**0**	**0**	**1,400**
19-99	**PERSONNEL**	**48.1**	**424,946**	**0.0**	**0**	**48.1**	**423002**	**0.0**	**0**	**0.0**	**0**	**0**	**0**	**1,944**
31-00		0.0	215,285	0.0	0	0.0	0	0.0	0	0.0	0	0	0	215,285
31-01		0.0	0	0.0	0	0.0	9366	0.0	0	0.0	0	0	0	9,366-
31-02		0.0	0	0.0	0	0.0	8991	0.0	0	0.0	0	0	0	8,991-
31-03		0.0	0	0.0	0	0.0	7887	0.0	0	0.0	0	0	0	7,887-
31-04		0.0	0	0.0	0	0.0	4399	0.0	0	0.0	0	0	0	4,399-
31-05		0.0	0	0.0	0	0.0	11472	0.0	0	0.0	0	0	0	11,472-
31-06		0.0	0	0.0	0	0.0	9366	0.0	0	0.0	0	0	0	9,366-
31-07		0.0	0	0.0	0	0.0	8926	0.0	0	0.0	0	0	0	8,926-
31-08		0.0	0	0.0	0	0.0	19323	0.0	58	0.0	0	0	58	19,381-
31-09		0.0	0	0.0	0	0.0	10755	0.0	0	0.0	0	0	0	10,755-
31-10		0.0	0	0.0	0	0.0	7567	0.0	0	0.0	0	0	0	7,567-
31-11		0.0	0	0.0	0	0.0	6203	0.0	0	0.0	0	0	0	6,203-
31-12		0.0	0	0.0	0	0.0	7446	0.0	0	0.0	0	0	0	7,446-
31-13		0.0	0	0.0	0	0.0	8091	0.0	0	0.0	0	0	0	8,091-
31-14		0.0	0	0.0	0	0.0	17822	0.0	0	0.0	0	0	0	17,822-
31-15		0.0	0	0.0	0	0.0	8727	0.0	0	0.0	0	0	0	8,727-
31-16		0.0	0	0.0	0	0.0	4143	0.0	0	0.0	0	0	0	4,143-
31-17		0.0	0	0.0	0	0.0	11583	0.0	0	0.0	0	0	0	11,583-
31-18		0.0	0	0.0	0	0.0	7446	0.0	0	0.0	0	0	0	7,446-

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51-43		0.0	0	0.0	0	0.0	4226	0.0	0	0.0	0	0	0	4 226
51-99	SUNDRIES	0.0	14,880	0.0	0	0.0	18130	0.0	0	0.0	0	0	0	1,250-
58-00		0.0	59-	0.0	0	0.0	0	0.0	0	0.0	0	0	0	59-
58-01		0.0	0	0.0	0	0.0	1059-	0.0	0	0.0	0	0	0	1 059
58-99	SUR PY OB	0.0	59-	0.0	0	0.0	1059-	0.0	0	0.0	0	0	0	1,000
59-99	MISC.COST	0.0	14,821	0.0	0	0.0	15071	0.0	0	0.0	0	0	0	250-
99-99	PROJ TOT.	48.1	1,316,520	0.0	0	48.1	1297457	0.0	116	0.0	0	0	116-	18 947