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21002

The Final Report  
on Executing of the Contract 92/102 Amendment B

UNIDO Project No. DP/DRK/87/002

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Written by Jin Yan . the Contractor's team leader

2nd March 1995

## I. Preface:

Till the end of Dec. 1994, all the service and facilities required in the contract 92/102 Amendment B which is an extension of the original contract for the UNIDO project DP/DRK/87/002 had been rendered by the contractor and had been accepted and inspected by IEI of Academy of Sciences of DPR Korea. IEI had acquired the technology and capability of manufacturing recorders which is essential for manufacture of gas and liquid chromatographs.

## II. Description of the work performed by the contractor and the results after execution of the contract amendment B

A. Supply of one set of high precision multi-functional recorder model EPR-224 in CKD.

B. Supply of 6 sets of key parts of model EPR-224 recorder.

C. Supply of necessary processing equipments and devices used for recorder manufacture.

a. One set of centreless grinding machine model M1020.

b. One set of standard voltage signal generator model 2552.

c. One set of special designed testing equipment model CHECK-0.

D. Supplying technological, technical and managerial knowledges and skills for design and manufacture of recorder to be connected to GC&LC which are being produced by IEI, through the technical training courses and relative technical documents. The details are shown in the report of training written by Mr. Bak Bong Hui, one of the trainees from IEI.

E. Technical training at the contractor's site.

a. Name of the trainees:

Mr. Bak Bong Hui, Researcher from IEI.

b. Name of the experts on recorder who were involved into the technical training

Mr. Wei Han, Senior Engineer from the Fifth Automation Instrument Factory of Beijing.

Mr. Zhang Lian Hui, Engineer from the Fifth Automation Instrument Factory of Beijing.

- c. Training period: One month (from 15th of september 1994 to 15th of october 1994).
- d. Training contents (both for lectures and practic)
  1. Design. Assembly and Test of electronic units of recorder
  2. Design and Assembly of the mechanic key parts of the recorder
  3. Final assembly and final test of the recorder
  4. Ageing procedure of the products
  5. Installation and operation of the recorder
  6. Operation training of special designed test equipment CHECK-0
  7. Installation. maintenance and operation on centraless grinding machine

The details of the training cours and the results can be refered to the training report written by the trainees attached here as the attachment of the final report. All the equipments and devices offered by the contractor have been accepted and installed and inspected by IEI.

### III. Conclusion:

Under the support of UNIDO and cooperation from UNDP Pyongyang office and the government of DPR Korea, the contractor BAIF and the subcontractor, The fifth Automation Instrument Factory of Beijing had finished executing of the contract: Amendment B to UNIDO contract no. 92/102 successfully and IEI has hold the technology and skills of design and manufacture of recorder which is necessary for a complet GC/LC system. Beside this, IEI has been equiped with basic devices used for design and manufacture of modern recorder products, so it has made the UNIDO project DP/DRK/87/002 more perfect and successful.

---- The End ----

Written by Technical Surpervisor  
of the Project

Jin

Yan



## Report of Training for Implementation of Extension of Service under the Project. DP/DKK/87/002

To implement the Extension of Service under the Project. DP/DKK/87/002, 3 members of trainees of the Institute of Experimental Instruments (IIE) the Academy of Sciences, PRC, Korea, were served the training for manufacturing recorder from the 14th of September 1994, to the 14th of October 1994, at the Beijing Fifth Automation Instrument Factory, China.

### 1. Total Success

Trainees had acquaintance with the following techniques through the training course for manufacturing recorder:

- Assembly and test of electronic units of recorder
- Assembly of key parts of recorder
- Final assembly and final test of recorder
- Ageing procedure of products

### 2. Contents of Lecture and Practice

- 1. Contents of Lecture
  - Characteristics and operational principle of EPR-221 recorder
  - Operational principle and structure of recorder
  - Operational principle of electronic circuits of EPR-221 recorder
- 2. Contents of Practice

- Assembly of electronic key parts of recorder
- Test of electronic key parts of recorder
- Assembly of mechanical key parts of recorder
- Final assembly and test of recorder.

### 3. Detailed Success

Rak Bang Hut, Research, IEL

The assembly and test of the mechanical key parts of the recorder were obtained in the course of training.

- Structure and operational principle of mechanical parts
- Assembly of mechanical parts for paper driving
- Assembly of nerve system
- Final assembly and adjustment of recorder
- Ageing procedure of products
- Test of recorder with CTR-1

Rim Bang Hut, Research, IEL

The operational principle, assembly and test of the electrical key parts of the recorder were obtained in the course of the training.

- Principles of electrical key parts (power source, DC/AC converter, alarm amplifier and paper driving circuit)

--- Test of the recorder with RFTDC COAXIAL  
CHECKER

--- Test of the recorder with CHART DRIVE  
CHECKER

--- Test of the recorder with SERVO CHECKER

--- Test of the recorder with FU CHECKER

--- Final assembly and testing of electronic  
key parts

--- Connecting electric line with special  
tools and Soldering in the PCB

#### 4. Conclusion

Training course for the "Attention of Service  
under the Project DT/DIR/01/002" was successfully  
carried out.

The trainees assimilated the operational  
principles, assembly of electrical and mechanical key  
parts and test of the recorder.

The trainees will play an important role  
in the production of the recorders in DPRK in future.

In the training the Chinese experts who were  
in charge of it made a great contribution.

We would like to thank them.

Head of trainees

Dea Bong Hui

*Asst. Dir.*

*Dir.*

*Dea Bong Hui*

15th of October, 1981.

Attachment 1

Experts who were involved in the training

No	Name	Sex	Age	Degree	Specialty
1	Wei Han	Male	47	Senior Engineer	Electronics
2	Zhang Lian Hui	Male	51	Engineer	Mechanics

Attachment 2

Technical Books which were provided to trainees

No	Title	Page	Quantity	Language
1	Manual of ER-221 bracket	20	2	Chinese
2	Manual of ER series units	7	2	Chinese