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The Final Report

on Executing of the Contract 92/102 Amendment B

UNIDO Project No. DP/DRK/87/002

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/DRL/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 centerless 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 course 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.

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 centerless grinding machine

The details of the training courses and the results can be referred 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 complete GC/LC system. Beside this, IEI has been equipped 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 Supervisor of the Project
Jin Yan
ATTACHMENT

Report of Training for Implementation of Extension of Service under the Project: BP/DKR/87/092

To implement the Extension of Service under the Project: BP/DKR/87/092, 12 members of the Institute of Experimental Instruments (IEI) of the Academy of Sciences, PRC. Hereby, were served the training for manufacturing recorders from the 1st of September 1994, to the 30th 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 recorders:

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

2. Contents of lecture and practice

1. Contents of lecture
--- Characteristics and operational principle of EPR-321 recorder
--- Operational principle and design of recorder
--- Operational principle of electronic circuits of EPR-321 recorder
--- Contents of operation
Assemble all electrical key parts of recorder.

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

II. Detailed process

Rak Heng Hui, Researcher, [RE]

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

- Structural and operational principle of mechanical parts
- Assembly of mechanical parts for paper-lifting
- Assembly of paper-sectional assembly and adjustment of recorder
- Against components of products
- Test of recorder with light-IA

and some on functions, etc.

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

- Principle of electrical key parts (operating method for electromagnetic and gear driving circuits)
Test of the recorder with BNL equipment.

Test of the recorder with CHART DRIVE CHECKER.

Test of the recorder with SERVO CHECKER.

Test of the recorder with mock-up of electronic key parts.

Connecting electric line with special tools and Soldering in the 482.

A conclusion.

The course for the training of service men in the Project 57/116/119/482 was successfully carried out.

The trainees received the theoretical principle 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 BNL in future.

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

He would like to thank them.

End of trainees.

Bak Baxa Hail 12/27 1964 Long Hail

### Attachment 1

**Experts who were involved in the training**

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<th>No</th>
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<th>Degree</th>
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<tr>
<td>1</td>
<td>Wei Han</td>
<td>Male</td>
<td>27</td>
<td>Senior Engineer</td>
<td>Electronics</td>
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<tr>
<td>2</td>
<td>Feng Jianli</td>
<td>Male</td>
<td>31</td>
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### Attachment 2

**Technical Books which were provided to trainees**

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