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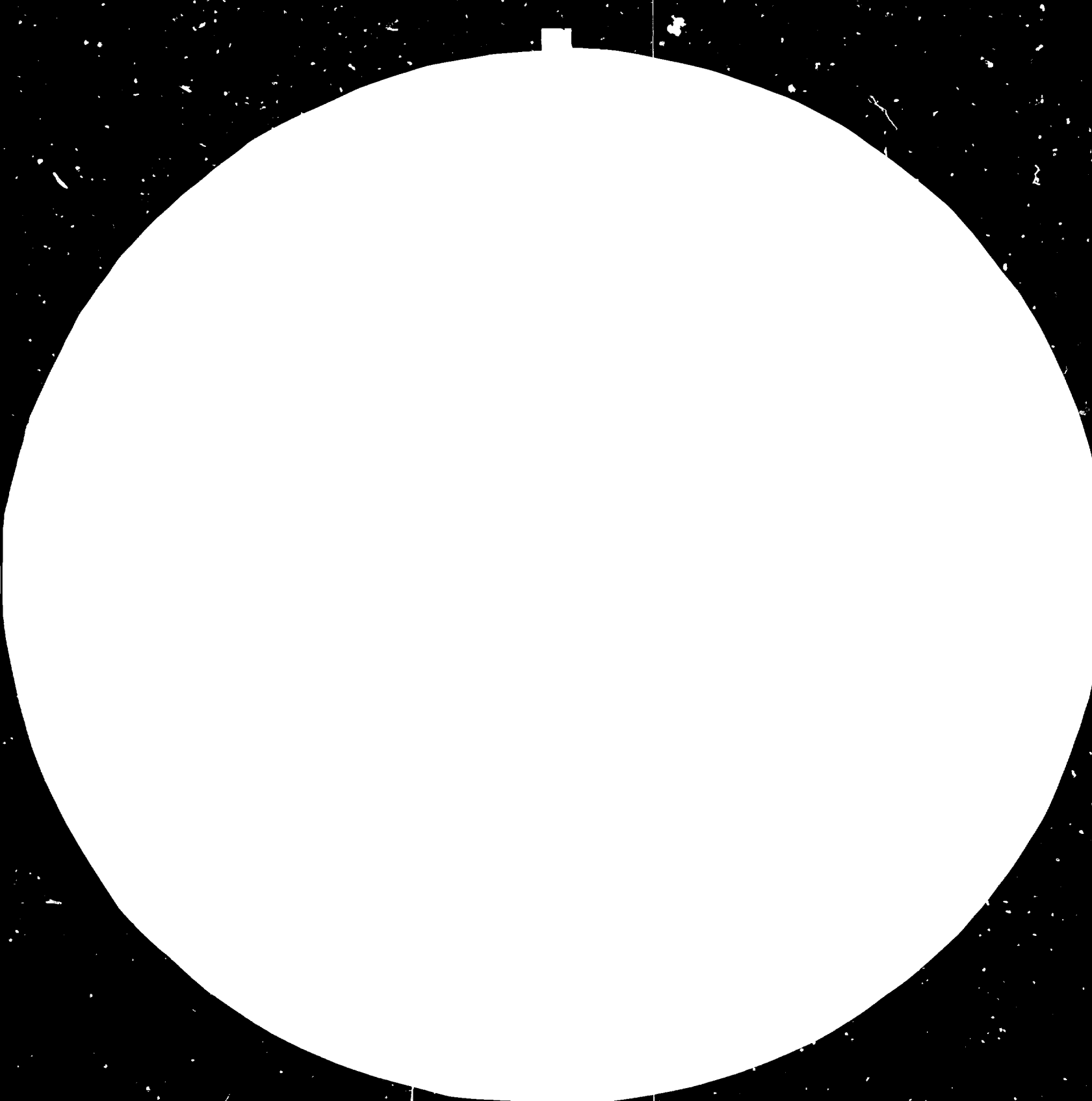
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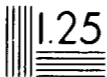


1.0 25

1.1 22



1.2 20



Minimum resolvable spatial frequencies were determined by the number of cycles per millimeter that could be resolved. The resolution of the system was determined by the number of cycles per millimeter that could be resolved. The resolution of the system was determined by the number of cycles per millimeter that could be resolved.

Specialized Institute for
Engineering Industries

Baghdad - Iraq

13219

Assistance in Quality Control

Project Number : DP/IRQ/77/003

Post Number : 11-04

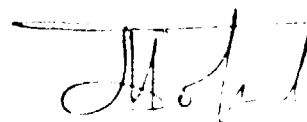
Reporting period : 7 December 1982 through 31 December 1983

FINAL REPORT

Baghdad, December 1983

Prepared by

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UNIDO Expert in
Quality Control



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ABERVIATIONS

1. SIEI - Specialized Institute for Engineering Industries
2. SOEI - State Organization for Engineering Industries
3. COSQC- Central Organization for Standardization and Quality Control

GENERAL VIEW

By the end of 1983 the Quality Control Department became a specialized research and quality control center for the Engineering Industries in Iraq. The main achievements of the Department are related to the following works:

1. The content of the Quality Control Manual is being gradually completed.
2. New types of measurements are introduced in the Laboratories practices,
3. Large-scale service in very complicated special measurements is being done on request of industrial organizations,
4. Statistical Quality Control methods are introduced in a number of engineering enterprises,
5. Quality Rating - a new sensitive method for quality analysis and control has started with implementation in two engineering enterprises,
6. Fundamental preparations for Metrology Assurance of Quality Control in engineering industry have been realized,
7. Analysis and discussion of the enterprises' Quality Reports is now an important continuous function of the Department,
8. Up-grading and training courses on quality control and measurements are organized in the SIEI two times a year,
9. Quality inspection in the SIEI Workshops covers now all internal production requirements.

According to my Job Description and corresponding Work Plan, I took part in some of those activities directly and together with my counterparts prepared a number of documents for new fields of activities of the Quality Control Department.

Two qualified counterparts have been working closely with me in all those new fields.

The third counterpart has left for a training courses on quality control to Sweden starting from 1 July 1983.

My study and training functions for counterparts were realized through discussions of the works in all details, in mutual experiments and testings of some methods and ideas in SIEI, COSCC and enterprises.

SUMMARY

The most important results of 1983 year work are as follows:

1. Centralized and unified National Calibration and Verification System is elaborated and prepared for implementation in the engineering enterprises. The System is prepared first for length, angles and roughness, but it could be spread on other physical measurements in future.
2. Unified system for collecting and analysing informations on defects inside an enterprise is prepared and recommended to use.
3. Unified system for collecting and analysing information on failures of final products in use (i.e. after sale) is prepared in a form which could be suitable for immediate implementation. Simplified but informative tables and diagrams are prepared to begin with a regular quality/reliability improving activity in the enterprises.
4. Proposals for accreditation of the SIEI Measuring/Testing Laboratories have been done based on the latest international rules and standards. This might gradually lead the SIEI Laboratories to be confident in measurements and testings in accordance with international requirements.
5. Some general recommendations on organization of quality control in production are prepared based on the system approach to the problem. The recommendations could be utilized by the engineering enterprises to introduce a Quality Control System in accordance with the requirements of the Iraqi Government Regulation on Standardization and Quality Control issued on June 1983.
6. Some practical preparatory works for metrology assurance have been realized:
 - testings of calibration methods for five basic types of measuring tools in the COSQC Laboratories,
 - registration of measuring tools and instruments in the SIEI Laboratories and Workshops.
7. Three more chapters for the SIEI Quality Control Manual are prepared according to the Manual Table of contents edited in 1978 with the assistance of UNIDO expert Mr. Terelius.

WORK PERFORMED

GENERAL

According to the Individual Work Plan, my work has been carried out in four separate fields:

1. Metrology assurance of quality,
2. Feed-back of information about quality,
3. SIEI Scientific Council,
4. System approach in quality control organization.

The work in every field was intended to perform in 3 general steps:

- study and analysis of existing needs, conditions, opportunities and tasks;
- elaborating the recommendations, methods, forms and other necessary documents;
- experimental implementation of new activities/methods in practice.

The third step of my work has been realized in very limited degree in the Metrology Assurance field only, due to prevailing local circumstances.

The results of all the works have been elaborated in the form of recommendations, instructions, methods ready for implementation/use in the industrial enterprises of SOEI. The elaboration corresponds to the factual conditions, requirements and opportunities. All those materials are transformed and translated in Arabic style and language.

At later stage, when it becomes clear that introduction of the work outputs should be postponed, a decision was made to bring those materials in the form of chapters of the SIEI Quality Control Manual. So, three new Chapters of the Manual are now completed in English and they will be translated into Arabic language.

The detailed list of the main activities performed in the reported period is given below:

METROLOGY ASSURANCE

The following works/documents have been completed:

1. Table of measuring tools used in the SOEI enterprises based on data collected from the enterprises' reports,
2. Measuring tools and instruments Classification and Codification System,
3. Unified forms of Tool Registration Card, Utilization Card, Calibration Card and recommendations on implementation of those cards in engineering enterprises,
4. Scheme and description of the Three-Level National Metrology Assurance System for linear, angular and roughness measurements,

5. Calibration methods for main types of measuring tools:
 - Gauge Blocks,
 - Vernier Calipers,
 - Micrometers,
 - Dial Indicators and Microcaters,
 - Bevel Protractors,
 - Plane Plug and Ring Gauges.
6. Experimental registration of measuring tools and instruments in the SIEI Measuring Laboratories and Workshops.
7. Testings of calibration methods and appropriate tools in the COSQC Metrology Laboratories,
8. Draft for a work programme on accreditation of the SIEI Laboratories,
9. Short review on Testing Laboratories Accreditation in other countries,
10. Collection of some number of foreign standards and regulations on the national and international accreditation requirements and procedures.

QUALITY INFORMATION
FEED-BACK

The following works/documents have been completed:

1. Available sources of necessary information about defects and failures of the SOEI enterprises have been studied.
2. General System for collecting, analysing and utilization of information feed-back about quality inside and outside enterprise.
3. Methods with necessary unified document forms and tables for collecting and analysing of data about defects-Inside Information.
4. Methods with necessary unified document forms and tables for collecting and analysing of data about failures-Outside Information.
5. Recommendation on utilization of both methods with some numerical examples.

SCIENTIFIC COUNCIL
OF SIEI

Project of the SIEI Scientific Council—Objectives and Fundamental Principles of organization — has been prepared.

QUALITY CONTROL
SYSTEM

This work gives a general view on informative and organizative structure of quality control system in an engineering enterprise. It is prepared in some methodological consequence suitable for studying the system approach in quality control and is also useful like a pattern in the beginning of a quality control system construction.

The content of this part:

1. Quantitative characteristics of quality,
2. Stages of creating and maintaining the quality,
3. Information Model of Quality Control System,
4. Quality analysis and planning,
5. Main elements of Quality Control System.

QUALITY CONTROL
MANUAL

Three new chapters for the SIEI Quality Control Manual have been edited. The works described in this report have been included in appropriate chapters and paragraphs of the Manual:

<u>Reg.No.</u>	<u>Title</u>
3	Organization
3.1	Organization for Quality System approach
10	Measuring equipment
10.1	Use and maintenance of measuring equipment
10.2	Routine for calibration control of measuring equipment
10.3	Advanced measuring and testing practice
15	Reports on failures and defects.

RECOMMENDATIONS

The general recommendation is to continue with the present quality control activities to pay more attention rather on implemented effectiveness than on scale of activities.

Some particular recommendation for the nearest period:

1. to continue with the SIEI Quality Control Manual,
2. to proceed with realization of the perspective work plan proposed by Mr. Terelius,
3. to introduce in practice the results of this year work:
 - to introduce Registration, Utilization and Registration Cards in the SOEI enterprises,
 - to start and proceed calibration activity in the enterprises,
 - to elaborate and approve calibration methods for other types of measuring tools/instruments,
 - to introduce the Quality Information and Analysis System in the enterprises as gradual approach to the Information Model of enterprise Quality Control System.
4. Laboratory accreditation criteria should be prepared and used first to check the degree of correspondance the laboratory measuring/teesting practice to the modern international requirements as to bring gradually this degree upto some necessary level in future.

COMMENTS AND
ACKNOWLEDGEMENTS

1. Type of newly introduced activities are necessary for farther development of Quality Control Department and it's influence on the engineering enterprises.
2. Understanding with administration and counterparts as well as working conditions were very satisfactory, but lack of final implementation is due to limited number of counterparts at this stage.
3. I would like to record my thanks to the CTA Mr. Stevan Buranj for the guidance and assistance in the execution of my programme.

