

Total Quality Management System in Metal Forming



Project Site Helwan

1. Background of Project

The Central Metallurgical Research and Development Institute (CMRDI) is directly affiliated with the Ministry of Science and Technology and contributes to the research, development and improvement of production technologies in the mining and industrial sectors in Egypt. The Government of Japan has continuously supported research in the department of welding through technical cooperation since 1985. Based on the welding technologies established by the technical cooperation, the Government of Egypt requested the Government of Japan to provide cooperation that aims at enhancing the quality of industrial products, particularly tin products by transferring the technologies of metal forming and quality management to the CMRDI.

2. Project Overview

(1) Period of Cooperation

1 April 1997-31 March 2000

(2) Type of Cooperation

Experts Team Dispatch Program

(3) Partner Country's Implementing Organization

Central Metallurgical Research and Development Institute (CMRDI)

(4) Narrative Summary

1) Overall Goal

The quality control system of metal forming is established and the stable delivery of high quality products is achieved.

2) Project Purpose

CMRDI effectively transfers its technical skills in metal forming and quality management to the

technicians in enterprises (public & private).

3) Outputs

- a) CMRDI staff acquires the knowledge of total quality management system in the field of sheet metal fabrication technologies such as planning, material selection, processing, welding, painting and testing.
- b) CMRDI staff can transfer their technologies to engineers in the industrial sector.

4) Inputs

Japanese Side

Long-term experts	3
Short-term experts	3
Trainees received	3
Equipment	28 million yen
Local cost	19 million yen

Egyptian Side

Counterparts	19
Facilities and equipment	
Local cost	40,000 Egyptian pounds (1.24 million yen)

3. Members of Evaluation Team

Team Leader:

Mitsuru HAGINO, Development Specialist, JICA

Metal Forming Technologies:

Seiji BAN, Industrial Service International, Co.

Cooperation Planning:

Hiromichi KATAYAMA, Middle East and Europe Division, Regional Department IV, JICA

4. Period of Evaluation

25 March 2000-1 April 2000

5. Results of Evaluation

(1) Efficiency

Most of the inputs were provided as planned, and generally, the project achieved the outputs efficiently. However, a press bending machine fault found after delivery caused a delay in the process of basic technical transfer in the metal forming department using the machine.

(2) Effectiveness

The counterparts understood well the concepts of total quality management and how to achieve standardization. Also, the manual for the quality check list was developed and utilized at the workplace. Although some activities are still ongoing such as the Quality Control (QC) activity, generally the outputs were nearly achieved. However, the activity of technical transfer to outside enterprises, a project purpose, was not yet achieved when the evaluation was made. CMRDI had received many technical inquiries from enterprises, but since the three-year cooperation period limited the degree of technical transfer of the basic technologies, application in industry must continue through steady on-the-job transfer of skills and knowledge.

(3) Impact

As mentioned above, the CMRDI has not gone so far as to provide quality management technologies to other enterprises yet, so there were no significant impacts in the industrial sector. But the counterparts developed several drawings and manuals in the local language, and made efforts to apply the technologies acquired on their own. Therefore, by gaining more experience in the future, it will be possible to transfer technologies to other enterprises and to contribute to enhance the quality of metal-forming-process products in Egypt.

(4) Relevance

As Egypt is now in transition from a government monopoly system to privatization of enterprises, there is an urgent need to promote competition among enterprises. To achieve this, it is necessary to achieve total quality management in each enterprise, and as a research and development institute of metal-forming processes, the CMRDI plays a key role in promoting the industrial sector, so the relevance of this project was confirmed. However, as both the metal-forming process technologies and total quality management were newly introduced ones for the CMRDI, the three-year-cooperation period was too short to achieve the level for technology transfer to other

enterprises.

(5) Sustainability

The basic technology transfer to the CMRDI was almost completed and it was considered that the CMRDI was able to give technical instruction to other enterprises after acquiring more experience.

In the welding and metal-forming process sectors, which were the focus of the project, the CMRDI demonstrated its clear intention to be an authorized organization of ISO that disseminates total quality management (TQM) based on the technology and specific sectors cited above, so it is expected to be sustained on its own.

6. Lessons Learned and Recommendations

(1) Lessons Learned

As the outputs were almost achieved and the project purpose expected to be achieved in the future, it was recommended that the project be completed at the end of March 2000. However, in order for technicians to increase their practical experience, the Egyptian side requested the Government of Japan to dispatch short-term experts who would address problems faced in the workplace. Regarding this request, the Government of Japan considered to respond as much as possible.

7. Follow-up Situation

Based on the status of CMRDI, a Project-type Technical Cooperation Program titled "Upgrading of Metal Processing Technologies" has begun from October 2000 and will run to September 2004. The aim was to promote technology transfer to the counterparts by granting additional equipment and strengthening technical services to outside groups and enterprises.

The Project for Rehabilitation and Upgrading of Amyria Water Treatment Plant (Phase II)

Project Site Cairo



1. Background of Project

In Egypt, the annual population increase is as high as 2.3 percent, and it is especially high at 3.3 percent in Greater Cairo, the capital region. Along with the population rise, the demand for water in the area has also grown rapidly. The Amyria Water Treatment Plant, one of the largest three water treatment plants in Greater Cairo, could supply 420 thousand m³/day of water (300 thousand m³/day of surface water and 120 thousand m³/day of groundwater) at maximum. However, because of the controlled water intake from groundwater due to its low quality, and the deterioration of the existing facilities, the daily amount of water supply decreased to 330 thousand m³/day, causing a daily water shortage for residents in Greater Cairo. The Government of Egypt requested Grant Aid from Japan in order to increase the water supply capacity of the Amyria Plant.

2. Project Overview

(1) Period of Cooperation

FY 1995, FY 1996, FY 1997

(2) Type of Cooperation

Grant Aid

(3) Partner Country's Implementing Organization

General Organization for Greater Cairo Water Supply (GOGCWS)

(4) Narrative Summary

- 1) Overall Goal
To improve the water supply services in Greater Cairo.
- 2) Project Purpose
To increase the water supply capacity of Amyria Plant.
- 3) Outputs

- a) The facilities of Amyria Plant are rehabilitated and upgraded including facilities for raw water intake, filtration, chlorination, clear water transmission, connection pipes and electrical instrumentation.
 - b) Water quality monitoring equipment is installed.
- 4) Inputs

Japanese Side

Grant	Total 2.86 billion yen (E/N amount)
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Egyptian Side

Counterparts
Land

3. Members of Evaluation Team

Facilities study:

Keiko YAMAMOTO, JICA Expert

Operation and maintenance study:

Mitsutaka HOSHI, Training Division, JICA Hachioji International Training Center

4. Period of Evaluation

5 December 1999-16 December 1999

5. Results of Evaluation

(1) Efficiency

Each stage of the project, including design, procurement and rehabilitation, was implemented smoothly; therefore, project efficiency was evaluated as high. The timing of procurement of equipment and materials was appropriate, despite that for 80 percent of these it took as long as 35 days to be transported from Japan. Although the project was implemented while existing facilities continued operation, no large problems

arose. This was considered partly a result of the overall good coordination among operation /maintenance, supervising and construction staff.

(2) Effectiveness

The project purpose was achieved, as the water supply capacity of Amyria Plant increased to 430 thousand m³/day, which was 100 thousand m³/day more than before the project.

(3) Impact

The project brought positive impacts. The water supply amount per person a day increased by 60 liters in the area served by the Amyria Plant. Water quality also improved since low-quality groundwater was no longer used as a water resource. On the other hand, there was some concern that communication difficulties between the Japanese team and the Egyptian Government during project implementation might adversely impact the operation and maintenance of the rehabilitated facilities by GOGCWS engineers.

(4) Relevance

The purpose and activities of the project were relevant to the needs and policies of Egypt. The project was consistent with the "Third Five-Year Water Supply Plan" and "Water Treatment Plant Development Plan", which are both based on "The Greater Cairo Water Supply Master Plan" formulated in 1979 and updated in 1990.

(5) Sustainability

The rehabilitated and upgraded facilities were well maintained and operated. Since the staff of the Amyria Plant had the basic skills for operating the facilities, there was technical sustainability. In this evaluation, however, defects were found in part of the machinery. It was considered important to improve the technical training for better operation and maintenance, and to select more appropriate equipment, which would be easier to maintain in Egypt.

Regarding the financial aspects, the management of water supply is vulnerable to the financial situation of the Government. GOGCWS allocates the plant's operation and maintenance budget. Since GOGCWS does not have a self-supporting accounting system, the increase in water supply of the Amyria Plant did not lead to a revenue increase for the Plant. As water tariffs remained extremely low, the operation and maintenance of GOGCWS facilities were subsidized by the Government.

In addition, some of the electrical instrumentation was difficult to maintain locally by the Egyptian side. Troubles with this instrumentation system would cause operational problems.



Water treatment facility



Electric operation board

6. Lessons Learned and Recommendations

(1) Lessons Learned

As seen in this project, high-tech electrical equipment procured from Japan is sometimes difficult to maintain in partner countries. Considering future operation and maintenance, it is recommendable to select equipment that can be procured and easily maintained within the country.

(2) Recommendations

At the time of the evaluation, the necessity for Follow-up cooperation was not recognized. For the improvement of operation and maintenance skills, however, it would be important to coordinate with the ongoing Project-type Technical Cooperation in Cairo, namely the "Water Supply Technology Training Improvement Project" (June 1997 to May 2002). Furthermore, it is advisable to revise the present water tariff system, so that the operation and maintenance costs are covered by collected water fees.

The Project for Supply of Equipment for the Regional Environmental Monitoring Network



Project Sites

Cairo, Alexandria, Mansura, Tanta, Suez



1. Background of Project

In Egypt, concern over air pollution and water contamination in large cities, such as Cairo and Alexandria, and in the Nile River basin had been growing since the rapid industrialization and urbanization of the 1960s. In 1994, the Government of Egypt formulated the Environmental Law, which aimed at designing and implementing strategies for environmental protection, and appointed the Egyptian Environmental Affairs Agency (EEAA), established as an organization under direct control of the prime minister in 1982, as the main implementing and coordinating organization.

EEAA planned to establish a regional environmental monitoring network system consisting of the Cairo Central Center (CCC) and eight Regional Branch Offices (RBOs) in order to monitor the status of the environment on a nation-scale and requested Grant Aid from Japan for the procurement of the necessary monitoring equipment. The Government of Egypt also requested technical cooperation under the Project-type Technical Cooperation Program.

2. Project Overview

(1) Period of Cooperation

First Stage: FY1996
Second Stage: FY1997

(2) Type of Cooperation

Grant Aid

(3) Partner Country's Implementing Organization

Egyptian Environmental Affairs Agency (EEAA)

(4) Narrative Summary

1) Overall Goal

Environmental monitoring network system is established at the national level in Egypt.

2) Project Purpose

Environmental monitoring and analysis in Cairo Central Center (CCC) and the five Regional Branch Offices (RBOs) in Cairo, Alexandria, Mansura, Tanta, and Suez is improved.

3) Outputs

- Examination and test equipment is provided in CCC and five RBOs.
- Training in the operation of the provided examination and testing equipment is conducted for the staff of CCC and five RBOs and monitoring of the environment is carried out.

4) Inputs

Japanese Side

Grant	Total 924 million yen (E/N amount)
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Egyptian Side

Facilities (Construction of the laboratories)

3. Members of Evaluation Team

JICA Egypt Office
(Commissioned to Environmental Quality International)

4. Period of Evaluation

1 October 1999-15 January 2000

5. Results of Evaluation

(1) Efficiency

Provision and installation of equipment, installation guidance and dispatch of engineers for test operation were all conducted conveniently as scheduled; therefore, project efficiency was evaluated as high.

(2) Effectiveness

As the necessary sets of equipment for CCC and RBOs to carry out their functions was provided, the environmental monitoring capability was improved. While simple measurement instruments for site use were used frequently though not in an organized or planned fashion, some of the provided equipment was not adequately used at the time of the evaluation. Reasons for this include: 1) Lack of a comprehensive plan for environmental monitoring at both national and regional levels; 2) Lack of clarity in the roles within individual organizations and between organizations concerned with environmental monitoring; 3) Operation plans of each laboratory of EEAA were not formulated; and 4) Training of staff was inadequate. Therefore, it was recommended that the partner country make corrective efforts in the future.

(3) Impact

Mobile measurement instruments were frequently used to obtain and analyze polluting substances at the source of pollution outbreaks, and this provided the comprehensive basic information necessary for the enforcement and implementation of environmental laws. Since mobility was improved following the provision of the mobile measurement instruments, potential offenders seem to have been deterred. In addition, awareness concerning environmental pollution was also growing among the citizens; thus, the impact of this project was high.

(4) Relevance

The relevance of this project was considered very high as it corresponded to the needs of EEAA, responsible for the installation and operation of the environmental monitoring network system, and the need of the nation to resolve the issue of pollution. The selected target organizations, the five RBOs and the CCC, also corresponded to the priority set by EEAA. In this sense, the relevance of this project was also high.

(5) Sustainability

There were some issues of sustainability of the system on the Egyptian side in terms of improving the function of environmental monitoring. Issues of concern were that the operational plans of laboratories were not yet formulated and the capability of personnel was insufficient. In particular, personnel had attempted to improve their capability by participating in training, but the level was still not sufficient to carry out the accurate research required by laboratories and to maintain the equipment.



A staff of CCC, analyzing total organic carbon

It was also necessary to secure the budget for spare parts and reagents to maintain and use equipment in a sustainable manner. EEAA had an optimistic view in this respect, and in fact, the central environmental monitoring center had already agreed to a long-term contract for the supply of spare parts and reagent.

6. Lessons Learned and Recommendations

(1) Lessons Learned

It is important to consider measures for technology transfer and sustainability including the maintenance of equipment, rehabilitation and acquisition of spare parts in projects of this sort.

(2) Recommendations

The project provided the major equipment necessary for improved environmental monitoring, but the Egyptian side still had problems in terms of human resources and institutional conditions for the best use of the equipment. To resolve such problems, intensive training was planned to provide all laboratory staff with the skills to fully use the provided equipment. At the same time, it was suggested that training should not be limited to the operation of equipment only, but should cover broad areas of environmental monitoring technology and quality management of testing research.

7. Follow-up Situation

The Environmental Monitoring Training project has been carried out under the Project-type Technical Cooperation since September 1997 and would continue for five years until 31 August 2002. The skills of maintenance, repair, and securing spare parts have been transferred. As such, the center has been attempting to secure sustainability.