

Chapter 3 Project Evaluation and Recommendation

Chapter 3. Project Evaluation and Recommendation

3-1 Project Effect

(1) Direct Effect

Table 3-1. Effects and Degree of Improvement on the Project

Present status and problems	Measures in this Project (grant aid project)	Effects and degree of improvement
1. Sorts of calibration and testing service of the Royal Scientific Society are limited due to lack and superannuating of equipment. Even in the existing services, number of the services are limited too as such inefficient equipment takes long period for one time service	<ul style="list-style-type: none"> • Procurement of equipment for calibration and testing for the Royal Scientific Society • Re-modeling of internal building, preparation of foundations, removal of existing equipment 	<ul style="list-style-type: none"> • With the equipment for calibration and testing, calibration and testing services of the Royal Scientific Society will be improved as follows. Sort of the services will increase from 147 to 199. New sorts of the services will be available, and required periods will be shorten with new efficient equipment in the existing service, then, number of the services will increase.
2. Due to lack and superannuating of equipment, technical consultation of the Royal Scientific Society to enterprises is limited.	<ul style="list-style-type: none"> • Ditto (The equipment for calibration and testing will be used for technical consultation purpose too.) 	<ul style="list-style-type: none"> • High quality technical consultation will be available at the Royal Scientific Society, which will contribute to improvement of technology of enterprises in Jordan, improvement of quality of their products, saving production costs, etc.

(2) Indirect Effect

1) Promotion of Industrial Sector in Jordan

With the improvement of functions of the calibration and testing services and technical consultation of the Royal Scientific Society, the enterprises in Jordan will be able to plan improvement of quality of products and saving production costs, and then competitiveness of the enterprises in Jordan will increase. And it will contribute to promotion of industrial sector and economic growth in Jordan.

2) Contribution to Industry of Surrounding Countries

About ten percent of requests to the Royal Scientific Society for the calibration and testing services are from firms in surrounding countries such as Syria, Lebanon, Palestine, Iraq etc. With the equipment for calibration and testing, the Royal Scientific Society will be able to provide wider and more accurate calibration and testing services than ever to those firms of the surrounding countries too.

And then, it will contribute to development of industrial sector in the whole area.

3) Promotion of Regional Trade

Jordan Institute for Standards and Metrology (JISM) is planning to conclude mutual recognition (M/R) with Syria, Lebanon, Palestine, Iraq, Egypt, Kuwait, Qatar, Saudi Arabia, Oman, Yemen, Tunisia, so that Jordan Quality Mark (JQM) and Jordan Accreditation System (JAS) can be accepted in the area. In the area, systems and organizations for calibration and testing of Jordan, Egypt and Tunisia are well prepared comparatively, then the three countries become centers for testing and assuring quality of products including surrounding countries, so that distribution of products are promoted in the area. In the plan, Jordan shall cover its own territory and Syria, Lebanon, Palestine and Iraq. For the plan, improvement of functions of calibration and testing of the Royal Scientific Society is one of necessary conditions, and then the Project will contribute to realization of the plan.

4) International Mutual Recognition

JISM is planning to conclude M/R with not only the Arab countries but also with the other advanced countries, so that JQM and JAS can be accepted internationally. After realization of the plan, JQM and JAS can be accepted in the advanced countries, and export of Jordanian products will become easier. At present, the procedure for conclusion of the M/R is suspended. One of major reasons of the suspension is lack of calibration and testing equipment in the Royal Scientific Society, and then the Project will contribute to realization of the plan.

3-2 Recommendation

(1) Cooperation with Technical Assistance

Technical level of the Royal Scientific Society is extremely high, each staff member has abundant knowledge and high skill, and the Royal Scientific Society confirmed that necessary instruction and training shall be arranged to new staff, therefore, technical assistance will not be a must although certain training on operation and maintenance by manufacturers experts is necessary for some items initially. However, it will be valuable for increasing of competitiveness of Jordanian products to use the equipment more practically with technical assistance. For upgrading of calibration and testing technology based on ISO17025 (accreditation of calibration and testing institute), technical assistance with dispatching technical experts will be efficient.

For individual field of industry, technical assistance with dispatching senior volunteers will be efficient. In the Royal Scientific Society, many senior volunteers have made technical assistance in several fields. At

present, senior volunteers are cooperating in the field of electric appliance, non-destructive testing of metallic products, textile and paper products, etc. If such senior volunteers are dispatched continuously, their cooperation is expected for operation and maintenance of the equipment too, and the equipment can be used more practically.

(2) Advertisement

The enterprises shall know details of the new sorts, ranges and accuracies of calibration and testing services of the Royal Scientific Society, so that they can renew their production and testing systems. After that, requests to the Royal Scientific Society for such services will be increased. Therefore, advertisement by Jordanian side of the project will be important.

(3) Replacement of the Equipment

Except for weights etc. that can be used permanently, the equipment will be superannuated and replacement or upgrading will be necessary even though maintenance of the equipment will have been made sufficiently. The Royal Scientific Society is expected to make financial arrangements to secure necessary fund for the replacement or upgrading of the equipment in future, for example, accumulating a fund every year etc.

As mentioned above, the Royal Scientific Society decided to include a part of the costs in the service charge in this opportunity of the project, and the Royal Scientific Society is revising the price formula of the services.

Appendices

Appendix 1. Member List of the Study Team

(1) Basic Design Study

Leader	Mr. TONOKAWA Hiroyasu	First Project Management Division, Grant Aid Management Department, JICA
Chief Engineer/ Equipment Planning 1	Mr. HIGUCHI Katsuhiko	UNICO International Corporation
Calibration & Testing Planning/ Operation & Maintenance Planning	Dr. YAMANOUCHI Chikako	UNICO International Corporation
Equipment Planning 2	Mr. KONDO Taiichi	UNICO International Corporation
Procurement Planning/ Cost Estimation	Mr. KIDANI Hideki	UNICO International Corporation

(2) Explanation of Draft Final Report

Leader	Mr. OCHIAI Naoyuki	Deputy Resident Representative JICA Jordan Office
Chief Engineer/ Equipment Planning 1	Mr. HIGUCHI Katsuhiko	UNICO International Corporation
Calibration & Testing Planning/ Operation & Maintenance Planning	Dr. YAMANOUCHI Chikako	UNICO International Corporation

Appendix 2. Study Schedule

(1) Basic Design Study

No	Date	Official		Consultants			
		Leader: Mr. TONOKAWA Hiroyasu	Chief Engineer/ Equipment Planning 1: Mr. HIGUCHI Katsuhiko	Calibration & Testing Planning/Operation & Maintenance Planning: Dr. YAMANOUCI Chikako	Equipment Planning 2: Mr. KONDO Taiichi	Procurement Planning/ Cost Estimation: Mr. KIDANI Hideki	
1	1/17	Sat	Tokyo (KL862, 11:00), via Amsterdam				
2	1/18	Sun	Amman (KL405, 3:10), Courtesy call on JICA office, Ministry of Planning & Int. Coop. Courtesy call on HCST, RSS, Meeting w/ RSS				
3	1/19	Mon	Meeting w/ RSS (ESTC, ERC)			Tokyo (OS52, 11:25), via Viena	
4	1/20	Tue	Courtesy call JISM, Meeting w/ RSS (ICC, MDTC)			Amman (OS7091/RJ128, 2:00)	
5	1/21	Wed	Meeting w/ RSS (ESTC, BRC), Draft of Minutes				
6	1/22	Thu	Signing on Minutes Report to Embassy, JICA office				
7	1/23	Fri	Amman (KL406, 2:15)	Data collection, Internal meeting			
8	1/24	Sat	Tokyo	Data collection, Internal meeting			
9	1/25	Sun		Meeting w/ RSS (ESTC: equipment for calibration)			
10	1/26	Mon		Meeting w/ RSS (ESTC, BRC: equipment for testing)			
11	1/27	Tue		Meeting w/ RSS (MDTC: equipment for testing)			
				Company visit (casting)		same as Chief Engineer	
12	1/28	Wed		Meeting w/ RSS (ICC: equipment for testing)			
13	1/29	Thu		Meeting w/ RSS (BRC, ERC: equipment for testing)			
14	1/30	Fri		Data collection, Internal meeting			
15	1/31	Sat		Data collection, Internal meeting			
16	2/1	Sun		Data collection, Internal meeting			
17	2/2	Mon		Data collection, Internal meeting			
18	2/3	Tue		Data collection, Internal meeting			
19	2/4	Wed		Meeting w/ RSS (QAD)			
20	2/5	Thu		Company visit	Procurement survey	Company visit	
21	2/6	Fri		Data collection, Internal meeting			
22	2/7	Sat		Meeting w/ ESTC		Company visit	same as Chief Engineer
				Meeting w/ ICC			
				Meeting w/ BRC			
23	2/8	Sun		Meeting w/ MDTC	Meeting w/ ESTC	Company visit	same as Chief Engineer
				Meeting w/ ERC			
24	2/9	Mon		visit JISM	Meeting w/ ESTC	Company visit	Procurement survey
				Meeting w/ MDTC		Meeting w/ ICC	
				Transportation survey			
25	2/10	Tue		Meeting w/ QAD	Company visit		Procurement survey
				Meeting w/ MDTC	Meeting w/ ESTC	Company visit	
26	2/11	Wed		Meeting w/ ESTC		Company visit	Procurement survey
				Meeting w/ MDTC	Meeting w/ ESTC	Meeting w/ ICC	
27	2/12	Thu		visit Ministry of Industry and Trade	Meeting w/ ESTC	Company visit	Procurement survey
				Meeting w/ MDTC	survey of HCST Pharmaceutical Unit	visit Jordan Univ.	
28	2/13	Fri		Data collection, Internal meeting			
29	2/14	Sat		Internal meeting	Amman (KL406, 2:15)	Data collection, Internal meeting	
30	2/15	Sun		Internal meeting	Tokyo	Data collection, discussion w/ RSS	
31	2/16	Mon		Meeting w/ ERC, BRC, MDTC, ICC		Company visit	Transportation survey
						Meeting w/ERC, ICC	Meeting w/ ERC, MDTC
32	2/17	Tue		Report to Embassy Report to JICA office		Amman (OS7092/RJ100, 11:10)	
33	2/18	Wed		Amman (KL406, 2:15)		Tokyo	
34	2/19	Thu		Tokyo			

(2) Explanation of Draft Final Report

No	Date		Official	Consultants	
			Leader: Mr. OCHIAI Naoyuki	Chief Engineer/ Equipment Planning 1: Mr. HIGUCHI Katsuhiko	Calibration & Testing Planning/ Operation & Maintenance Planning: Dr. YAMANOUCHI Chikako
1	5/22	Sat		Tokyo (LH711, 9:50), via Frankfurt	
2	5/23	Sun		Amman (LH3510, 1:55), Courtesy call on JICA office	
				Courtesy call on Embassy, Ministry of Planning & International Cooperation, RSS	
3	5/24	Mon		Meeting w/ RSS (QAD)	Meeting w/ ESTC (equipment for calibration)
				Meeting w/ ICC (equipment, specifications)	
				Meeting w/ ESTC (equipment for testing)	
4	5/25	Tue		Data collection, Internal meeting	
5	5/26	Wed		Meeting w/ QAD	
				Meeting w/ MDTC (equipment, specifications)	Meeting w/ ESTC (equipment for calibration)
6	5/27	Thu		Meeting w/ QAD	
				Meeting w/ ERC, BRC, ESTC (equipment for testing)	Meeting w/ ESTC (equipment for calibration, specifications)
7	5/28	Fri		Data collection, Internal meeting	
8	5/29	Sat		Data collection, Internal meeting	
9	5/30	Sun		Meeting w/ QAD	
				Meeting w/ MDTC (equipment, specifications)	Meeting W/ ESTC (equipment for calibration, specifications)
				Meeting w/ ESTC (equipment for testing)	
				Meeting w/ RSS (draft of minutes)	
				Meeting w/ ESTC (equipment for testing)	
10	5/31	Mon	Signing on Minutes Report to Embassy		
11	6/1	Tue		Amman (LH3511, 3:05)	
12	6/2	Wed		Tokyo	

Appendix 3. List of Parties Concerned in the Recipient Country

The Higher Council for Science and Technology

Dr. Taher H. Kanaan	Secretary General
Ms. Majeda Al-Assaf	Head, Agriculture and Water Section

The Royal Scientific Society

Prof. Dr. Sa'ad Hijazi	President
Dr. Seyfeddin Muaz	Vice President
Mr. Fawaz Takrouri	Director, Quality Assurance Department
Mr. Nazam Abu Sa'da	Quality Assurance Department
Ms. Samira Adel	Head of Central Registry
Dr. Fawaz Ali Thwabieh	Central Registry
Mr. Omar Tarawneh	Procurement Manager, Procurement Division
Mr. Raed Shawabkah	Procurement Division
Dr. Saqer Abdel-Rahim	Director, Information Technology Center
Ms. Sirin S. Hasan	Head of Research & Information Div., Information Technology Center
Dr. Khaled Kahhaleh	Director, Building Research Center
Mr. Mustafa Abuain,	Assistant Director, Building Research Center
Dr. Bashar H. Nabulsi	Head, Laboratory Division, BRC
Mr. Magaddar Akroush	Head, Ceramic Laboratory, BRC
Mr. Ayoub Abdessalam	Head, Cement and Concrete Laboratory, BRC
Mr. Nizar Qaqish	Head, Building Components Laboratory, BRC
Mr. Raed Al Sunna	Acting Head, Civil Studies Division, BRC
Dr. Naseem Haddad	Director, Mechanical Design and Technology Center
Mr. Mahmoud Mosa	Head, Non Destructive Testing & Radiation Division, MDTC
Mr. Saed Barakat	Head, Non Destructive Testing Unit, MDTC
Mr. Osama Melhem	Head, Measurement and Calibration Unit, MDTC
Mr. Samer Al-Kharouf	Head, Radiation Measurement and Calibration Laboratory, MDTC
Mr. Yahia Abu-Khaled	Head, Personal Dosimetry Laboratory, MDTC
Ms. Nadia Khraishi	Head, Material Technology Division, MDTC
Mr. Yousef A. Tabaze	Head, Plastic and Rubber Laboratory, MDTC
Dr. Tarawneh Ahmad	Head, Strength of Materials Laboratory, MDTC
Dr. Azzam Odeh	Head, Metallurgical Engineering & Measurement Division, MDTC

Ms. Abeer R. Arafat	Engineer, Metallography and Heat Treatment Unit, MDTC
Mr. Emad O. Abi Hamdi	Head, Thermal Testing Unit, MDTC
Mr. Yousef Abu-Hmeidan	Head, Design and Manufacturing Division, MDTC
Mr. Mike Haddad	Head, Casting Technology Unit, MDTC
Mr. Ayman Ghamoh	Head, Design Unit, MDTC
Ms. Rula Allaf	Engineer, Design Unit, MDTC
Dr. Tareq A. Hasan	Director, Electronic Services and Training Center
Mr. Fawaz Al-Labadi	Head, Standards and Calibration Division, ESTC
Mr. Mazen S. Al-Momani	Head, Testing and Quality Control Division, ESTC
Mr. Mazen Younis	Head, Research & development Division, ESTC
Dr. Yaseen M. Khayyat	Director, Industrial Chemistry Center
Dr. Ra'fat Nimer	Assistant Director
Ms. Kholood Majali	Head, Textile & Paper Division, ICC
Mr. Rida Radwan	Head, Applied Technology Division, ICC
Mr. Adi Said	Head, Inorganic Materials Division, ICC
Dr. Nageh Yousef Akeel	Head, Organic and Food division, ICC
Mr. Ahmad Nasser	Paints, Lacquers and Solvents Laboratory, ICC
Dr. Bassam Hayek	Director, Environment Research Center
Mr. Nael Almulki	Quality Officer, ERC
Mr. Emad Eddadu	Head, Chemical Analysis Laboratory, ERC
Mr. Moh'd Fuad Abu Sharkh	Chemical Analyst, Chemical Analysis Laboratory, ERC
Mr. Yazen Jmeian	Chemical Analyst, Environmental & Organic Laboratory, ERC
Mr. Ahmed Ali Fayad	Head, Chemical Analysis Unit
Mr. Sharif Arar	Chemical Analyst, Environmental & Organic Laboratory, ERC
Mr. Faysal Anani	Head, Air Quality Division, ERC
Mr. Jihad Alsawair	Researcher, Air Quality Division, ERC
Ms. Jehan Haddad	Researcher, Air Quality Division, ERC
Dr. Khleifat Husein	Head, Microbiology Unit, ERC
Mr. Norio Shigematsu	JICA Senior Volunteer
Mr. Shinji Taguchi	JICA Senior Volunteer
Mr. Yoshiyuki Ikeda	JICA Senior Volunteer
Dr. Masaki Okazaki	JICA Senior Volunteer

Ministry of Industry and Trade

Mr. Amer Hadidi	Director, Industrial Development
Dr. Jamal Najj Mahasneh	Head, Studies and Industrial Policies Section

Jordan Institute for Standards and Metrology

Dr. Ahmad Thogan Hindawi	Director, General
Mr. Nidal Y. Zayadeen	Director, Planning and Development Department
Ms. Ola K. Al Zawati	Accreditation Unit

Ministry of Planning and International Cooperation

Ms. Wafa Al-Saket	Head, Asia Section
Mr. Ghaith Madadha	Desk Officer, Asia Section
Mr. Saif Dani Ata	Desk Officer, Asia Section

Embassy of Japan

Mr. Shunichi Kamiya	First Secretary
Mr. Tetsuhiro Endo	First Secretary

JICA Jordan Office

Mr. Hideo Morikawa	Resident Representative
Mr. Naoyuki Ochiai	Deputy Resident Representative
Mr. Tsutomu Kobayashi	Assistant Resident Representative
Mr. Akihiro Iwasaki	Assistant Resident Representative
Mr. Yu Umemiya	Senior Volunteer Programme Coordinator
Mr. Adel O. Zureikat	Senior Program Officer

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Appendix 4. Minutes of Discussions

(12/2004)

MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT FOR IMPROVING THE QUALITY OF PRODUCTS
AND INCREASING THE COMPETITIVENESS OF THE INDUSTRIAL SECTOR
IN THE HASHEMITE KINGDOM OF JORDAN

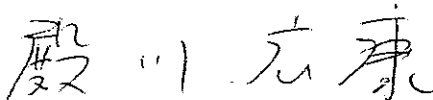
Based on the results of the Preparatory Study, the Government of Japan decided to conduct a Basic Design Study on the Project for Improving the Quality of Products and Increasing the Competitiveness of the Industrial Sector (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Hashemite Kingdom of Jordan (hereinafter referred to as "Jordan") the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Hiroyasu TONOKAWA, First Project Management Division, Grant Aid Management Department, JICA, and is scheduled to stay in the country from January 18, 2004 to February 13, 2004.

The Team held discussions with the officials concerned of the Government of Jordan and conducted a field survey at the study area.

In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

Amman, January 22, 2004



Mr. Hiroyasu Tonokawa
Leader,
Basic Design Study Team
Japan International Cooperation Agency
(Japan)



Dr. Seyfeddin Muaz
Acting President,
The Royal Scientific Society
(Jordan)

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve the technical capabilities of the Royal Scientific Society in order to improve the quality of products and to increase the competitiveness of the industrial sector in Jordan.

2. Project Sites

The site of the Project is in Amman

3. Responsible and Implementing Agency

3-1. The Responsible and Implementing Agency is the Royal Scientific Society (RSS).

3-2. The organization chart of RSS is attached as ANNEX-1

4. Items requested by the Government of Jordan

After discussions with the Team, the items described in ANNEX-2 were finally requested by the Jordanian side. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

5. Japan's Grant Aid Scheme

The Jordanian side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Jordan as explained by the Team and described in ANNEX-3 and ANNEX-4 of the Minutes of Discussions signed by both parties on June 12, 2003.

6. Schedule of the Study

6-1. The consultants will proceed to further studies in Jordan until February 13, 2004.

6-2. JICA will prepare the draft report in English and dispatch a mission in order to explain its contents around May, 2004.

6-3. In case that the contents of the report are accepted in principle by the Government of Jordan, JICA will complete the final report and send it to the Government of Jordan around August, 2004.

7. Other Relevant Issues

7-1. Equipment covered by the Project

Equipment covered by the Project will be selected from the list of items attached as ANNEX-2. Final decision on this matter will be made by the Japanese side during the further study in Japan on the basis of the result of the field survey and in accordance with "the criteria for selection of equipment and decision of quantity and specifications" attached as ANNEX-3

7-2. Priority of Equipment

Requested equipment shall be squeezed to minimum items, numbers and specifications necessary for the achievement of the project objective. The Jordanian side will submit to the Team the priority areas to be covered by the Project and the priority of requested equipment before February 11, 2004.

7-3. Equipment requested from the Environmental Research Center

Equipment requested from the Environmental Research Center is categorized as follows.

- (1) Equipment for testing quality of products
- (2) Equipment for testing quality of raw materials
- (3) Equipment for testing environmental performance of manufactures

The Jordanian side explained that the above (2) testing was directly related to the quality of products and that the above (3) testing was directly related to the competitiveness of the industrial sector. The Team explained that the eligibility of the above (2) and (3) equipment should be examined carefully from the viewpoint of the extent of contribution to the project objective.

7-4. Explanation by the Jordanian side on the National Calibration Laboratory

(1) The objective of the establishment of the national calibration laboratory is to provide internationally traceable calibration services to both RSS's laboratories and the industrial sector in Jordan.

(2) The idea to establish the national calibration laboratory in RSS has already been approved by the national steering committee for metrology

(3) Calibration activities of RSS, which are now conducted by the Electronics Services & Training Center, the Mechanical Design & Technology Center and the Building Research Center, will be integrated into the existing standards & calibration laboratory of the Electronics Services & Training Center as the national calibration laboratory, but it is expected that the integrated laboratory will become an independent center of RSS in the future

(4) It is not prerequisite for the implementation of the Project to name the integrated

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laboratory as the national calibration laboratory because the calibration services expanded by the implementation of the Project is within the present function of RSS.

7-5. Operation and Maintenance

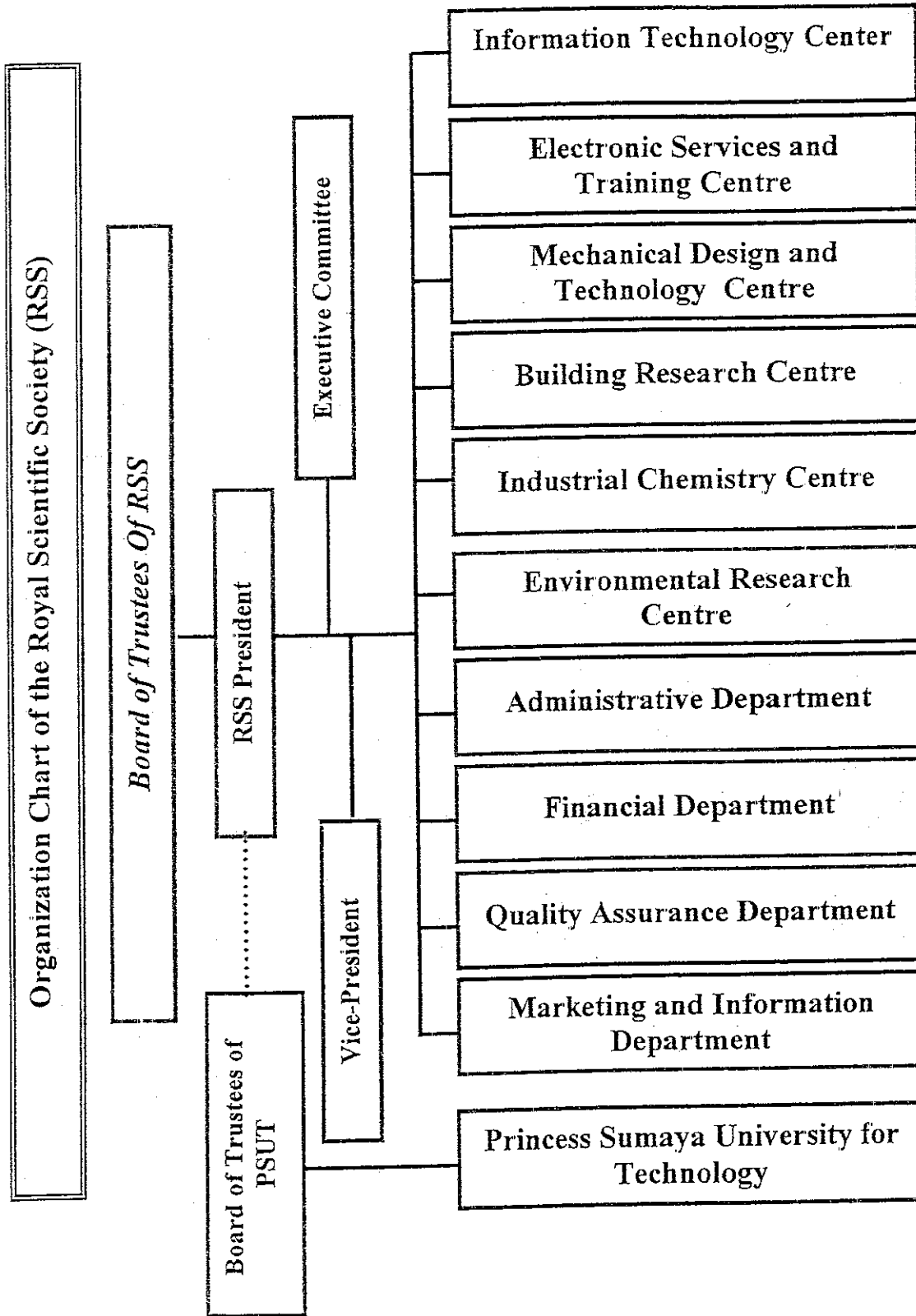
The Jordanian side will allocate sufficient number of staff and enough budget in order to operate and maintain equipment covered by the Project properly.

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ANNEX-1: Organization Charts



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Handwritten initials/signature

ANNEX-2: Items Requested by the Government of Jordan

NATIONAL CALIBRATION LABORATORY (NCL)

No.	Description	Quantity
A. Electrical Calibration System		
A-1	Direct Voltage Reference Standard	1
A-2	Resistance Standards (complete set, all range)	1
A-3	Direct Voltage Standard	1
A-4	Oscilloscope Calibrator with Options & Accessories	1
A-5	DC Null Detector	1
A-6	Digital Multimeter	1
A-7	Spectrum Analyzer	1
A-8	Power Meter Calibrator	1
A-9	Power Supply	1
A-10	High Voltage Digital Voltmeter	1
A-11	1000A AC/DC Current Source	1
A-12	Current Probe	1
A-13	Function Generator	1
A-14	High Voltage Source	1
A-15	Microwave Frequency Counter	1
A-16	Variable Auto Transformer	1
A-17	High Voltage Probe	1
A-18	Scope Meter	1
A-19	Standard Capacitances (4 kinds)	1
A-20	Decade Capacitor	1
A-21	Standard Inductance (6 kinds)	1
A-22	Global Positioning System with time interval counter	1
A-23	Power sensor	1
A-24	Calibration Asset Track/Management software	1
A-25	Multifunction Calibrator	1
B. Temperature Calibration System		
B-1	Water Bath	1
B-2	Fluid Bath	1
B-3	Fluid Bath	1
B-4	Salt Bath	1
B-5	Ice Point Reference	1
B-6	Ice Machine with crusher	1
B-7	Triple Point of Water Cell	1
B-9	Freezing Point of Indium Cell	1
B-11	Freezing Point of Aluminum Cell	1
B-12	Freezing Point of Tin Cell	1
B-14	Freezing Point of Copper Cell	1
B-15	Bath for Maintaining Triple point of Water and Gallium Cells	1
B-16	Bath for Maintaining Indium, Tin, Zinc and Aluminum Cells	1
B-17	Bath for Maintaining Silver and Copper cells	1
B-18	Dry Block calibrator	2
B-19	Spherical furnace	1
B-20	Humidity / Temperature Recorder	1
B-21	Humidity / Temperature Chamber	1
B-22	Reference Standard Thermocouples and Resistance thermometers	4
B-23	Working Standard Thermocouples and Resistance thermometers	4
B-24	Digital Precision Thermometers	4
B-25	Liquid In Glass Thermometers	10
B-27	Clamps for holding thermometers and thermocouples	10
B-28	Cold Junction comparison	1
B-29	Multiplexer Selector Switch	1
B-30	Pyrometer	1
B-31	Portable Infrared calibrator (Black Spot)	1
C. Length Calibration System		
C-1	Gauge Block Set / Steel / 112 pcs	2
C-2	Gauge Block Set	2
C-3	Gauge Block Set	2
C-4	Gauge Block Set	2
C-5	Angle Block Set (12 pcs)	2
C-6	Gauge Block Accessory Kits	2
C-7	Caliper checker	2
C-8	Inside Micro Checker	2
C-9	Depth Micro Checker	2
C-10	Digital Tape Measure	2
C-11	Set of control glasses for parallelism	2

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No.	Description	Quantity
C-12	Black Granite Surface Plate and Tables	4
C-13	Optical Flat Set	2
C-14	Digital Micrometer	4
C-15	Digital Calipers	4
C-16	Bore Gauges	4
C-17	Digital Angle protractor	2
C-18	Micrometer stand	2
C-19	Dial Gauge stand	2
C-20	Dial Gauge Tester	1
C-21	Precision Level	1
C-22	Granite Comparator stand	2
C-23	Peak wide stand Microscope	1
C-24	Edge Scale for measurement of parallelism of vernier calipers	2
C-25	Maintenance Kit for gauge blocks	2
C-26	Linear Scale (up to one meter steel)	2
C-27	Automatic Gauge Block Comparator	1
C-28	Surface Roughness Tester	1
C-29	Machine for calibration of length standards, steel rulers, etc.	1
C-31	Special Gauge block set for vernier caliper with control ring for inner diameter and height	2
C-32	Plate for tempering gauge blocks	2
D. Mass Calibration System		
D-1	Weight Sets E1 Class	2
D-2	Weight Sets E2 Class	2
D-3	Weight Sets F1 Class	1
D-4	Weight Sets M1 Class	1
D-5	Electronic Digital Balance	1
D-6	Electronic Digital Balance	1
D-7	Electronic Digital Balance	1
D-8	Digital Balance Comparator	1
D-9	Digital Balance Comparator	1
D-10	Digital Balance Comparator	1
D-11	Digital Balance Comparator	1
D-12	Apparatus for Measuring Density of Weights	1
D-13	Apparatus for Measuring Magnetic Susceptibility of Weights	1
D-14	Desiccator	1
D-15	Balance Tables, Apparatus Tables and Accessory kits	9
D-16	Humidity controlled cabinets for maintain of reference weights	1
E. Pressure Calibration System		
E-1	Dead weight Testers complete with	2
E-2	Low, Medium, and High range pressure piston and	3
E-3	Weight set high range 20-700 bar	1
E-4	Precision pressure and vacuum gauges	4
E-5	Hydraulic Digital Pressure Calibrators (Fluid and Air)	2
E-6	Vacuum pump with pipe and valve system	1
E-7	Vacuum meter calibrated with indicator	1
E-8	Mercury manometers	2
E-9	Barometer	1
E-10	Fittings, Valves, & pressure tubes. (sets)	2
F. Force Calibration System		
F-2	Digital Force Read Out	2
F-3	Reference Standard Machine for calibration of Load Cells	1
F-4	Load Cell / Compression & Tension	2
F-5	Load Cell / Compression & Tension	2
F-6	Load Cell / Compression & Tension	2
F-7	Load Cell / Compression & Tension	2
F-8	Load Cell / Compression & Tension	2
F-9	Load Cell / Compression & Tension	2
F-10	Proving Rings / Compression & Tension	6
F-11	Torque Calibration System	1
G. Volume & Density Calibration System		
G-1	Weighing machine	1
G-2	Balance	1
G-3	Standard Flasks	10
G-4	Standard Pipettes	10
G-5	Standard Burette	8
G-6	Standard Tanks	3
G-7	Standard Hydrometer	1
G-8	Specific gravity meter	1
G-9	Temperature Bath	1
G-10	Water Distillation Apparatus	1

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No.	Description	Quantity
G-11	Manometer	1
G-12	Plastic Tubing	1
G-13	Dry Oven	1
G-14	Pycnometer	1
G-15	Barometer	1
G-16	Hydrometer	1
G-17	Desiccator	1
H. Flow Calibration System		
H-1	Reference Standard and Working Flow Meters (Fluid and Air)	4
H-2	Standard Apparatus for calibration of flow meters (Fluid and Air)	1
I. Speed Calibration System		
I-1	Reference Standard and Working Tachometers	2
I-2	Standard Apparatus for calibration of Tachometers	1
J. Light Calibration System		
J-1	Reference Standard and Working Luxmeters	2
J-2	Reference Standard Source in IR and UV region	2
J-3	Standard Apparatus for calibration of Luxmeters	1

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ELECTRONIC SERVICES AND TRAINING CENTER (ESTC)

No.	Description	Quantity
1. Equipment needed for testing safety of Home Use Electronic Appliance		
1	Insulation and breakdown tester	1
2	Leakage current meter	2
3	Ball pressure test set	1
4	Spring operated impact hammer	2
5	Needle flame test apparatus	1
6	Water pressure apparatus	2
7	Heating cabinet	2
8	Proof tracking test apparatus	1
9	IP Rating Test equipment with all accessories	1
10	Creepage Gauge set	1
11	Torque screw drivers/spanners	1
12	Inclined plane	1
13	High frequency power supply	1
14	Door endurance tester for microwave ovens	1
15	Hot winding ohmmeter	1
16	Digital Tachometer	2
17	Digital Power Meter	1
18	Digital Lux meter	1
19	Torque tester for lamps	1
20	Life cycling tester for lamps	1
21	- Rigid Test finger with Force meter	1
	- Test Pin Dia. 3 - Dia. 4, l = 15	1
	- Test Nail	1
	- Test probe Dia. 30 x 80 mm	1
	- Jointed Test Finger with Guard Dia. 50 x 20 x 100	1
22	Variable transformers	2
23	Resistance Battery	1
24	Surface resistivity meter	1
25	Digital clamp-on Ammeters	2
26	Multimeters	5
27	RCL Meter	1
28	Glass fibers insulation	2
29	Test corner	1
2. Equipment needed for testing of Electric Irons		
1	Balance	1
2	Circular blade crosscut tester	2
3	Steam pressure measuring apparatus	1
4	Apparatus for measuring temperature drop under load	1
5	Test apparatus for total steaming time	1
6	Digital Thermometer with recording option	2
7	Fall Down Tester	1
3. Equipment needed for testing of Switches, Plugs and Sockets		
1	Tumbling barrel	1
2	Pendulum impact test apparatus-mechanism	1
3	Mounting device for impact test	1
4	Apparatus for checking the withdrawal force	1
5	Apparatus for cord retention testing	1
6	Impact Weight Apparatus with:	1
	- Intermediate Piece for Low Temperature Test	1
	- Intermediate piece for Pin Insulating Sleeves	1
	- Falling Weight 1000g	1
	- Falling Weight 100 g	1
7	Intermediate piece for low temperature test	1
8	Intermediate piece for pin insulating sleeves	1
9	Pendulum impact test apparatus-polyamide hammer	1
10	Mounting block for flush type equipment	1
11	Arrangement for mechanical strength test on multiple socket outlets	1
12	Apparatus for socket-outlets breaking capacity and normal operation test	1
13	Apparatus for flexing test	1
14	Device for testing non-solid pins	1
15	Arrangement for compression test	1
16	Apparatus for plug pin abrasion test	1
17	Tracking test apparatus	1
18	Apparatus for pressure test at high temperature	1
19	Dynamometer	1
20	Device for checking the resistance to lateral strain	1
21	4-step double programmable timer	1

No.	Description	Quantity
22	Programmable off switching counter	1
23	Pneumatic drive unit	1
23	Test apparatus for making and breaking capacity for switches	1
25	Conductor damage test set	1
26	Corrosion test apparatus	1
27	Endurance test system	1
28	Gauge for Non-Accessibility Checking	1
29	Gauge for Non-Accessibility Checking after the Normal Operation Test	1
30	Gauge for verification of Grooves, Holes, and Reverse Tapers	1
31	Gauge for the verification of the Outline of Covers or Cover-Plates	1
32	Apparatus for compression test for verification of resistance to heat	1
33	AC current source	2
34	Inductive Loads:	
	- Air core inductor 100 mH, 25 A	1
	- Air core inductor I _{max} 63 A, cos ϕ max 0.6	1
	- Resistive Loads:	
	- Resistance Battery 10 kW	1
35	Tungsten Filament Lamp Loads	1
4. Equipment needed for testing of Refrigerators, Freezers, and Bottle Coolers		
1	Multi-Channel Temperature Logger (PC Based Data Acquisition) with PC and software.	3
2	Test Packages with suitable filling materials (chemicals)	1
3	50/60 Hz Frequency Converter	1
4	Digital KW.h Meter	2
5	Temperature and Humidity Chamber	1
6	Water Evaporation Apparatus	2
5. Equipment needed for testing of Lead Acid Starter Batteries		
1	Temperature Chamber	1
2	Vibration Tester	1
3	High Rate Discharge Tester with accessories	1
4	Universal Battery Tester	1
5	Water Bath	1
6. Equipment needed for testing of Television Receivers:		
1	Ionization meter	1
2	Several special equipment for laser classification	1
3	Temperature recorder (multi-channel) with thermocouples	2
4	Pink noise generator	1
5	Testing box	1
6	Band-pass filter for wide-band noise measurement	2
7	Oscilloscope	1
8	Softening temperature-testing equipment	1
9	Discharge meter	1
10	Test finger (Test probe B of IEC 61032)	1
11	Test pin (Test probe 13 of IEC 61032)	1
12	Test pin (Diameter 4 mm, length 100 mm)	1
13	Test pin (Test probe 16 of IEC 61032)	1
14	Straight test probe (Test probe D of IEC 61032)	1
15	Test probe C of IEC 61032	1
16	Test hook (Fig 4, 180 mm by 5 mm by 8 mm)	1
17	Rigid test finger (Test probe 11 of IEC 61032)	1
18	Test tool	1
19	Surge test generator	1
20	Dielectric strength tester	1
21	Dielectric strength for sheet material test instrument	1
22	Spring hammer	1
23	Test plug	1
24	Torque (fixings, knobs, screw terminals, strain relief of flexible cord)	1
25	Pull / Push	1
26	Antenna plug tester	1
27	Microscope	1
28	Full draught oven	1
29	Endurance Test for switches	1
30	Flexing apparatus	1
31	Test equipment for strain relief	1
32	Torque gauges	1
33	Inclined plane 10°	1
34	Resistance to fire test equipment	1
35	Oven	1
36	Test probe	1
37	Video test signal generator	2

No.	Description	Quantity
38	Audio test signal generator	1
39	Teletext test signal generator	1
40	RF signal generator	1
41	Spectrum analyzer with digital frequency counting function	1
43	Video noise meter	1
44	Vectorscope	1
45	Audio level / distortion meter	1
46	Passive devices	1
47	Television test modulator	2
48	Low capacitance probe	3
50	Luminance meter and colorimeter with telescopic lens	1
51	Optical measurement instruments	1
7. Equipment needed for testing of Circuit breakers:		
1	Short circuit current test set with all accessories	1
2	Mechanical shock test apparatus	1
3	Glow wire test apparatus	1
4	Mounting support for mechanical impact test	1
5	Mechanical impact test apparatus	1
6	Uninterrupted duty test set with all accessories	1
7	Making and Breaking Tester	1

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MECHANICAL DESIGN AND TECHNOLOGY CENTER (MDTC)

No.	Description	Quantity
1. Plastics & Rubber Unit		
1	Universal testing machine	1
2	Melt flow indexer	1
3	Analytical balance	1
4	Forced circulation oven	1
6	Computerized tensile film tester	1
7	Sample preparation machine (lathe)	1
8	Dial gauge calipers	3
9	Punch dies for plastic tensile samples	3
10	Certified mercury thermometers	
10-1	15°C -30°C ± 0.05°C	3
10-2	15°C -15°C ± 0.05°C	4
10-3	20°C -80°C ± 0.1°C	4
10-4	70°C -120°C ± 0.1°C	4
10-5	110°C -150°C ± 0.1°C	4
10-6	170°C -220°C ± 0.1°C	4
10-7	-10°C to 30°C ± 0.1°C	4
11	End caps for pressure testing of pipes	1
2. Strength of Materials Unit		
1	Automated Universal tensile/compression testing machine	1
2	Analytical balance SB 24001	1
3	Thermocouple	1
4	Impact testing machine	1
6	Hydrostatic pressure tester	1
3. Measurement & Calibration Unit		
1	Dogmatic height master	1
2	Ring gauge	1
3	Metric long series gauge block	1
4	Procession steel cubes	1
5	Calibrated steel balls	1
6	Set of standard specimens for roughness tester	1
7	Flow meters	1
8	Cement lining thickness gauge	1
9	Digital balance	1
10	Digital balance	1
11	Digital balance	1
12	Ultrasonic thickness gauge	1
13	Ultrasonic thickness gauge	1
14	Coating and oxidation thickness gauge	1
4. Metallography & Heat Treatment Unit		
1-1	Scanning Electron Microscope with:- WDX (Wave length Dispersive X-ray) microanalysis.	1
1-2	CSN Analyzer	1
2	Cutting Machine:	1
3	Grinding and polishing machines.	
3-1	- Grinding: using twin wheel machine	1
3-2	- Polishing: single wheel machine.	1
4-1	Digital Universal Hardness Tester (Brinel, Vickers, and Rockwell)	1
4-2	Mini-load hardness (Micro-hardness) tester (Vickers)	1
5	Portable Spectrometer	1
6	Carbon Sulphur Analyzer references material:	16
7	Universal Hardness Tester References Blocks	10
8	Electronic Balance	1
9	Electric Furnace	1
10	Salt Spray cabinet	1
11	Four pins meggar for measuring soil resistivity	1
12	Water Testing Kit, Portable	1
13	Automatic Mounting Press Machine for Sample preparation	1
14	Lacquer thickness measurement	1
15	Oxygen meter computerized (portable)	1
16	pH meter computerized (portable)	1
17	Cu/CuSO ₄ reference electrode computerized (portable)	1
18	Calomel & Ag/AgCl reference electrodes for corrosion experiments	1
5. Thermal Testing Unit		
1	Establishing a facility (closed room) to test radiator	1
2	Establishing a facility to test domestic gas cookers	1
6. Non-Destructive Testing Unit		
1	Directional X-Ray machine for industrial radiography	1
3	Digital Ultrasonic flow detectors with probes for testing of welds and casting.	2

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No.	Description	Quantity
4	Digital Ultrasonic thickness gauges	2
7. Radiation Measurement and Calibration Lab.		
1	Low level Gamma spectroscopy system	1
2	Gamma - Ray spectroscopy analysis software	1
3	Portable Gamma spectroscopy system	1
4	Radon / Radon daughter detector	1
5	Gross Alpha / Beta Counter	1
6	Neutron Dose / Dose Rate Meter	1
7	Four - input Multi - Channel Buffer	1
9. Casting Technology Unit		
1	Portable Hardness Tester	1
2	Induction Furnace	1
3	Mobile Sand testing Laboratory for foundry industry	1
4	Standardization and calibration kit for sand test specimens	1

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INDUSTRIAL CHEMISTRY CENTER (ICC)

No.	Description	Quantity
1. Textile & Paper Unit		
1	Nu-Martindale tester	1
2	Washing Machine	1
3	Steaming Cylinder with steam generator	1
4	Air Permeability of Paper	1
5	Driven Precision Yarn Reel Instrument	1
6	Motor driven water penetration tester	1
7	Reflectometer	1
8	Tensile machine	1
2. Cigarettes Unit		
1	Linear Smoking Machine	1
2	Gas Chromatograph	1
3. Organic & Food Unit		
1	Gas Chromatography/Mass Spectrometer (GC/MS) & Accessories	1
2	Gas Chromatography/Flame Ionization (GC/FID)	1
3	High Performance Liquid Chromatography (HPLC) (Preparative)	1
4	Automatic Kjeldahl Nitrogen Analyzer	1
5	Milk Analyzer	1
6	Meat Analyzer	1
7	Polarimeter	1
8	Titration Apparatus	1
9	Amino Acid Analyzer	1
10	Automatic Melting Point Apparatus	1
11	Moisture Meter	2
12	Density meter & accessories for oils and alcohols	1
13	Muffle Furnace	1
14	pH/Ion Meter	1
15	CHNO (Carbon-Hydrogen-Nitrogen-Oxygen)	1
16	Food Lab System	1
4. Petrol & Lubricants Laboratory		
1	Lubricant Test Machine	1
2	Dielectric Breakdown Voltage of Insulating Liquids	1
3	Evaporating Loss of Lubricating Oils (Noack Test)	1
4	Drop Test Apparatus	1
5	Determination of Vapor pressure acc.	1
6	Determination of Air Release Value	1
7	Demulsibility Characteristics	1
8	Rapid Flash point Tester	1
9	Automatic Oxygen Bomb Calorimeter	1
10	Bench top XRF	1
5. Paints, Lacquers & Solvents Laboratory		
1	Constant Climate Chamber	1
2	Cone and Plate Viscometer	1
3	Digital Constant Temperature Bath/ circulator & cooler	1
4	Drying Time Recorder & Film Applicator	1
6	Superchroma Spectrocolori Meter	1
7	Low Voltage Holiday Detector	1
6. Inorganic Material Div.		
1	Atomic Absorption Spectrophotometer	1
2	XRD - (X-Ray Diffractometer)	1
3	Sequential Plasma Emission Spectrometer (ICPS)	1
4	XRF- Sequential Spectrometer	1

BUILDING RESEARCH CENTER (BRC)

No.	Description	Quantity
1	Traxial apparatus, fully computerized according to BS 1377 and ASTM D 2850 standards.	1
2	Auto Test Compression/Flexural Machine	1
3	Guarded Hot Plate apparatus	1
4	Accelerated Weathering Chamber	1
5	Equipment and accessories to test Sanitary Ware	1
8	Non-Destructive Ultrasonic testing device	1
9	Water Permeability of Concrete	1

ENVIRONMENTAL RESEARCH CENTER (ERC)

No.	Description	Quantity
1	Multi stage Cyanide distillation system	1
2	Ion chromatograph	1
3	Purge & Trap concentrator	1
4	Precision Integrated sound level meter/ noise dosimeter.	1
5	Environmental cabinet assembly (environmental chamber) for testing resistance to growth of mold on the surface of interior coatings	1
6	Gas Chromatograph/ Electron Capture Detector (GC/ECD)	1
7	Rotary Evaporator System	1
8	Total Kjeldahl Nitrogen Digester/Distillator	1
9	Different equipments to establish a new soil analysis laboratory including: Soil Mill accompanied with	1
	i - 2mm Sieve sheet	1
	ii - Replacement brush strips	1
	iii- Dust collection system	1
	- Shaker	1
	- Analytical Balance	2
	- Oven	1
	- Ultrasonic batch cleaner	1
	- Fume hood	1
10	Occupational Air Quality Portable Analyzer	1
11	Occupational Volatile Organic Compounds (VOC's) Portable Analyzer	1
12	Provision of up-to-date Windows operated software	1
13	Continuous Fine Dust Monitor	1
14	Dynamic Gas Calibration System	1
15	Primary Roots Meter Calibrator	1
16	Total Reflection X-Ray Fluorescence (TXRF) / Fluorescent EDX	1

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ANNEX-3: Criteria for selection of equipment and decision of quantity and specification

	Calibration equipment	Testing equipment
Selection of equipment (Necessity)	<ul style="list-style-type: none"> ① Calibration equipment for laboratory equipment of RSS ② Calibration equipment for measuring or testing equipment of firms etc. 	<ul style="list-style-type: none"> ① Testing equipment for Jordanian industrial products
Selection of equipment (Propriety)	<p>Not to fall into any one of the following categories:</p> <ul style="list-style-type: none"> ① Items without reliable allocation of staff and budget necessary for good operation and maintenance after procurement ② Items which require high technique, expensive cost or many staff members for good operation, maintenance and traceability/calibration ③ Items which require large-scale modification/construction of buildings for installation ④ Items for which installation areas or storage places are not secured. ⑤ Items for which frequency of use is low or needs of calibration or testing from the industrial sector are rare ⑥ Items necessary for calibration or testing which is conducted more efficiently by other institutions ⑦ Items which may be prepared by other donors at present or in future ⑧ Simple equipment, tools, standards etc. which can be easily procured by RSS ⑨ Items which can be substituted by existing equipment ⑩ Items which have difficulty to procure spare parts or consumables locally ⑪ Short-lived items ⑫ Consumables ⑬ Items which are manufactured or supplied by only one company 	
Quantity	<ul style="list-style-type: none"> ① Setting up necessary quantities based on frequency of use, necessary time of use and traceability/calibration ② Planning common use of equipment among centers/divisions/units/laboratories ③ Deducting the numbers of existing equipment 	
Specifications	<ul style="list-style-type: none"> ① Considering specifications (ranges, accuracies, etc) of testing equipment for calibration or those of industrial products for testing ② Considering ranges, accuracies, etc. required by standards in Jordan or countries importing Jordanian products ③ Considering specifications necessary for keeping or acquisition of accreditation of international authoritative institutions ④ Setting up specifications provided that more than one (generally three or more) manufacturers are applicable. 	

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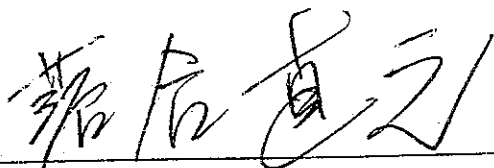
MINUTES OF DISCUSSIONS
ON BASIC DESIGN STUDY ON THE PROJECT
FOR IMPROVING THE QUALITY OF PRODUCTS
AND INCREASING THE COMPETITIVENESS OF THE INDUSTRIAL SECTOR
IN THE HASHEMITE KINGDOM OF JORDAN
(EXPLANATION ON DRAFT REPORT)

In January 2004, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Project for Improving the Quality of Products and Increasing the Competitiveness of the Industrial Sector, (hereinafter referred to as "the Project") to the Hashemite Kingdom of Jordan (hereinafter referred to as "Jordan"), and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the study.

In order to explain and to consult Jordan on the components of the draft report, JICA sent to Jordan the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Naoyuki OCHIAI, Deputy Resident Representative, JICA Jordan Office, from May 23 to June 1, 2004.

As a result of discussions, both parties confirmed the main items described on the attached sheets.

Amman, May 31, 2004



Mr. Naoyuki OCHIAI
Leader
Basic Design Study Team
Japan International Cooperation Agency
(Japan)



Prof. Dr. Sa'ad Hijazi
President
The Royal Scientific Society
(Jordan)

ATTACHMENT

1. Components of the Draft Report

The Government of Jordan agreed and accepted in principle the components of the draft report explained by the Team.

2. Japan's Grant Aid scheme

The Jordanian side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Jordan as explained by the Team and described in Annex-3 and Annex-4 of the Minutes of Discussions signed by both parties on June 12, 2003.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed specified items and send it to the Government of Jordan by the end of August, 2004.

4. Other relevant issues

4-1. Request on the Components covered by the Project

The Jordanian side requested to modify the draft report as ANNEX-1.

The final decision on this matter will be made by the Japanese side after further studies on the contents of request in Japan.

4-2. Necessary Works to be covered by the Project

The Jordanian side will conduct the necessary works described in the draft report before the commencement of the installation of the equipment covered by the Project.

4-3. Proper Operation and Maintenance of the Equipment

The Jordanian side will operate and maintain properly and effectively the equipment procured under the Project by means of allocating necessary budget, recruiting required personnel and training the newly recruited personnel as described in the draft report.

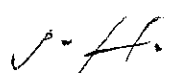
4-4. Replacement of the Equipment

The Jordanian side will make sincere efforts to secure necessary fund for the replacement

and upgrading of the equipment procured under the Project.

4-5. Confidentiality of the Draft Report

Both sides agreed that the contents of the draft report including specifications of the equipment would be confidential, be dealt with carefully and not be disclosed to any third parties until the tendering stage of the Project will be completed.



ANNEX-1.

No.	Equipment	Contents of Request	Reason	Priority
F-3	Reference Standard Machine for Calibration of Load Cells	Restore 1 unit to the planned equipment.	There are many demands on calibrations of load cells for 4 laboratories and enterprises, which is about 100-200 times/year. External calibration takes about 6 months in Germany or more than 1 year in Egypt.	1
A-20	Decade Capacitor	Restore 1 unit to the planned equipment.	A-20 as a working standard is absolutely necessary for calibration services of condensers for enterprises.	2
F-11-B	Torque Transducer Calibration System	Restore 1 unit to the planned equipment.	This is very important for F-11-A Torque Calibration System	3
H-1-b	Reference Standard and Working Flow Meters (Fluid, medium flow)	Restore 2 units to the planned equipment.	It is indispensable as primary standard and working standard for the flow calibration system.	4
H-1-c	Reference Standard and Working Flow Meters (Fluid, low flow)	Restore 2 units to the planned equipment.	It is indispensable as primary standard and working standard for the flow calibration system.	5
ESTC-6-38	Audio test signal generator	Restore 1 unit to the planned equipment.	It is indispensable to generate audio signals for testing of TV sets. And, there are many demands on the testing.	1
ESTC-6-37	Video test signal generator	The second apparatus for the equipment including Teletext signal generator.	It is indispensable to generate video signals and teletext signals for testing of TV sets. And, there are many demands on the testing.	2
ESTC-6-50	Luminance meter and colorimeter with telescopic lens	Restore 1 unit to the planned equipment.	It is indispensable to test input of CRT of TV sets. And, there are many demands on the testing.	3
ESTC-6-2	Several special equipment for laser classification	Restore 1 unit to the planned equipment.	Many TV sets are equipped with optical disk drives (DVD etc.) in Jordan. It is indispensable to test safety of laser devices of the drives. And, there are many demands on the testing.	4
ESTC-6-28	Full draught oven	Restore 1 unit to the planned equipment.	It is indispensable to test heating resistance of TV sets. And, there are many demands on the testing.	5
ESTC-7-1	Short circuit current test set with all standard accessories	Restore 1 unit to the planned equipment.	It is indispensable to test circuit breakers. And, there are many demands on the testing.	6
ESTC-3-20	Device for checking the resistance to lateral strain	Restore 1 unit to the planned equipment.	It is indispensable to test sockets. And, there are many demands on the testing.	7
ESTC-1-20	Life cycling tester for lamps	Restore 1 unit to the planned equipment.	It is indispensable to test lamps. And, there are many demands on the testing.	8
ESTC-1-14	Door endurance tester for microwave ovens	Restore 1 unit to the planned equipment.	It is indispensable to test microwave ovens. And, there are many demands on the testing.	9

No.	Equipment	Contents of Request	Reason	Priority
ESTC-2-4	Apparatus for measuring temperature drop under load	Restore 1 unit to the planned equipment.	It is indispensable to test electric irons. And, there are many demands on the testing.	10
ESTC-2-5	Test apparatus for total steaming time	Restore 1 unit to the planned equipment.	It is indispensable to test steaming time of electric irons. And, there are many demands on the testing.	11
MDTC-7-5	Gross Alpha / Beta Counter	Restore 1 unit to the planned equipment.	It is necessary not only for testing of raw materials but also for testing of mainly final products (foods, beverages etc.) MDTC-7-4 Radon/Radon Daughter Detector can be deleted instead, if budget is not enough.	1
MDTC-6-3	Digital Ultrasonic Flow Detectors with probes	2 units are necessary.	Frequency of use is very much high, and 2 units are necessary. Almost accessories can be deleted to increase the number of main unit.	2

In case of a shortage of the budget, items to be deleted from planned equipment instead of the above items are as follows (to be deleted from the bottom).

No.	Equipment	Quantity	Priority
ESTC-6-40	RF Signal Generator	1	1
ESTC-1-4	Spring operated impact hammer	2	2
ESTC-4-3	50/60 Hz Frequency Converter	1	3
ESTC-1-17	Digital Power Meter	1	4
ESTC-2-2	Circular blade crosscut tester	1	5
ESTC-4-4	Digital kWh Meter	2	6
ESTC-1-3	Ball pressure test set	1	7
ESTC-7-2	Mechanical shock test apparatus	1	8
ESTC-2-3	Steam pressure measuring apparatus	1	9
ESTC-3-2	Pendulum impact test apparatus-mechanism with polyamide hammer and mounting device	1	10

Appendix 5. References

No.	Title	Issued by	Year
1	Economic & Social Development Plan (1999-2003) Chap. 15, 1999-11-02	Ministry of Planning and International Cooperation	1999
2	General Framework of National Industrial Policy, The National Program for Jordan's Industrial Sector Qualification and Development, Executive Summary	Ministry of Industry and Trade	2001
3	Social & Economic Transformation Program	Ministry of Planning and International Cooperation	2002
4	Central Bank of Jordan Monthly Statistical Bulletin	Central Bank of Jordan	2003
5	Standards and Metrology Law	Government of Jordan	2000
6	Jordan in Figures 2001	Department of Statistics	2002
7	Emerging Jordan 2003	Oxford Business Group	2003
8	Jordan Economic Overview 2000	Ministry of Planning and International Cooperation	2000
9	Jordan Institution for Standards & Metrology	Jordan Institute for Standards and Metrology	2002
10	Jordan Standards Catalogue 2001	Jordan Institute for Standards and Metrology	2001
11	Jordan Standards Catalogue 1999	Jordan Institute for Standards and Metrology	1999
12	Jordan's Competitiveness Book	Ministry of Planning and International Cooperation	2003
13	User Guide for Calibration and Verification Activities in Jordan	Jordan Institute for Standards and Metrology	2001
14	Royal Scientific Society, Annual Report 2002	The Royal Science Society	2003
15	Royal Scientific Society, Intellectual Capital Report 2002	The Royal Science Society	2003
16	Jordan in Figures 2002	Department of Statistics	2003
17	The Global Competitiveness Report 2003-2004	World Economic Forum	2004
18	Central Bank of Jordan Annual Report 2002	Central Bank of Jordan	2002
19	Support to the Implementation of the EU-Jordan Association Agreement First Project Steering Committee Meeting	Ministry of Planning and International Cooperation	2003
20	Jordan's National Social & Economic Action Plan (2004-2006)	Ministry of Planning and International Cooperation	2003
21	Jordan Institution for Standards & Metrology	Jordan Institute for Standards and Metrology	2003
22	JAS Accreditation News	Jordan Institute for Standards and Metrology	2002
23	Accreditation Unit, JAS	Jordan Institute for Standards and Metrology	2002
24	Industry, Trade and Investment Bulletin, December 2003	Ministry of Industry and Trade	2003
25	Industrial Sector (unofficial draft)	Ministry of Industry and Trade	2004
26	Monthly Data of Meteorology	Department of Meteorology	2004
27	Jordan Phosphate Mines Co.	Jordan Phosphate Mines Co.	2003
28	Jordan Paper and Cardboard Factories Co. Ltd. (JPCFCL)	JPCFCL	2003
29	Jordan Petroleum Refinery Company (JPRC) "47th Annual Report"	JPRC	2002
30	JOPETROL Jordan Lubricating Oils 2002"	JPRC	2002
31	General Deluxe	Abu Haltam for Electronic and Electric Industries Corp.	2003
32	General Deluxe "Electronics The World of technology" (Catalogue)	ditto	2003
33	Quality Manual to BS EN ISO 9002; 1994	ditto	1994
34	Universal (Catalogue)	Jordan Universal Gas Cookers and Washing Machines	2003