

8-3 (M/M) 協議の概要

S/Wの原案は、日本側で作成準備して事前にシリア側に提出してあったので、シリア側も事前検討をよく行っていたようである。従って技術的な内容に付いての深い検討・討議は行わずとも主旨は充分理解されたようである。

全国の火力発電所の定期点検・補修工事等の運転・保守管理については、電力需要が非常に逼迫しているため計画的でかつ十分な作業が実施しにくい情勢であることが表明された。

このような事情を理解した上で、後日のサイト視察に際して発電設備（ボイラ、タービン、発電機）の運転管理状況をよく視察することとした。

協議内容については、別添の署名したM/Mに示す通りである。

1) マスタープラン作成の背景と特徴

急激な人口増加（3.6%）、順調な経済開発（8.2%）及び電源開発の遅れを背景として、電力供給が需要を満たしきれず電力不足が大きな問題となっており、市場経済への移行に伴う経済開発、特に産業部門における開発の制約となっている。

電力不足は、近年シリアにおける生活で日常的である停電、ダマスカス首都圏及びその他の地域で1日約5時間程度、によって特徴づけられている。

電力省は、上記のような深刻な状況を打開するため、国家開発政策に基づき、新規電源の開発促進に積極的である。

また、発電、送電及び変電設備などの既存電力設備は、フル稼働を余儀なくされておりシステムの信頼度を維持するために、緊急にリハビリを行う必要があり同時に、システムの効率を改善するためにリノベーションの実施が望ましい。

電力供給システムにおける運転・保守管理のための人材開発は、MOEの最優先課題である。

2) 本調査の特徴

本スタディの対象プロジェクトは、次の2つに分けられる。

①既存火力発電所のリハビリ

本調査では、水力発電、送電設備、変電設備及び配電設備は対象とはしない。

既存火力発電所の大方は、10～15年経過しているのに電力需給の逼迫のため現在フル稼働せざるを得ない状況にあるため、定期点検・補修等も満足に出来ていない。システムの信頼度の維持と運転効率の向上を計るためには、緊急にリハビリ・リノベーションを行う必要性が切実である。

②火力発電設備の効率的利用

発電所の運転・保守管理のスタッフ訓練は長い時間を必要とする課題であることを留意する必要がある。

運転・保守管理の効率改善は、各発電所ごとの適切なマネジメントによる地道かつ持続的な努力が必要である。

既存運転・保守管理システムにおける主要な改善課題及びその制約要因を明確にすることが重要である。

3) マスタープラン作成の目的

本調査の最終目的は、緊急に対応が必要と認められる既存火力発電所のリハビリ及びリノベーションの最適計画を策定することである。

また、火力発電所の効果的かつ効率的な利用のために火力発電の運転・保守管理のための人材訓練の検討を行うことである。

なお、本マスタープラン作成に当たってはその調査対象地域はシリア全域とする。

4) マスタープラン作成の範囲

本調査は、次の3つの部分から構成される。

(1) M/Pのためのマクロ・フレームワーク調査

①データ収集及び現地調査

社会経済及び電力需要における調査、エネルギー及び環境保全政策における調査、既存発電所のサイト視察を含む電力供給システムにおける調査、電力開発計画及び投資計画における調査、政策・制度における調査から構成される。

②既存計画のレビュー及び分析

電力需要予測、電力供給拡張計画、電力開発及び投資計画、各発電所発電計画政策・制度のレビュー及び分析より構成される。

本調査の実施結果に基づいて、次の2つの調査を実施することとする。

(2) 既存火力発電所のリハビリ及びリノベーションM/P調査

①対象発電所の選定調査：既存火力発電所のレビュー、予備評価及び最優先順位の検討及び緊急性の高い火力発電所の選定

②詳細調査及び代替案分析：選定発電所の詳細調査、初期環境調査（IEE）リハビリリノベーションの代替案の策定・分析

③リハビリ及びリノベーション計画の策定：概略設計及びコスト積算、経済・財務分析及び提言策定

(3) 運転・保守管理のための人材訓練に係わる調査

①運転・保守管理システム改善に関する調査

既存発電所の現存の運転・管理システムのレビュー及び改善事項の分析

②人材訓練のコンセプトの策定

③人材訓練プログラムの策定

5) 本調査の実施体制及び必要資料の準備

MOE/PEGTは、本調査に関する事項をJICAと協議するカウンターパート機関であり、技術移転を効果的に行うために、可能なかぎり早期にその内部にタスクフォースを設立する必要がある。

また、MOE/PEGTはタスクフォースを通じ、本調査の実施機関でありシリア側ステアリング・コミッティの調整機関の役割を担っている。

電力専門家から構成されるタスクフォースはMOE/PEGTの代表及び関連機関から構成され、JICA調査団の直接のカウンターパートとして全ての技術的事項について担当する。

政策決定者であるステアリング・コミッティは、MOE/PEGTの代表及び関連機関から構成されタスクフォースを通じてJICA調査団に対し指針及び提言を行う。

6) 必要データの提供

本調査のために必要かつ信用性のある情報をPEGTをはじめ様々な機関から収集するのはかなりの作業を必要とする。今回、本調査に必要なデータに関する質問状を策定し、MOE/PEGTからデータ入手可能性及びデータ入手先の回答を得た。MOE/PEGTは本格調査が開始する前までに全ての入手可能データを準備して、JICAシリア事務所を通じ提供することになった。

S/Wを協議するにあたってシリア側(MOE)と日本側予備調査団との間で討議した議事内容を記し署名したM/Mを別添に示す。

開發調查要請案件調書

TERMS OF REFERENCE OF MASTER PLAN STUDY
ON
REHABILITATION & MAN POWER TRAINING
FOR POWER PLANTS IN SYRIA

開発調査要請案件調査書

国名	シリア	公館名	在シリア大使館	担当者記号名	山本
案件名 (注1)	和：電力訓練研修所設立計画 英(仏・西)：Rehabilitation & Manpower Training for Power Plants (M)				
調査形態(注2)	M/P	調査分野(注3)	公益事業(電力)		
実施機関名(注4)	電力省				
正式要請書	○・無(年 月入手見込み)		TOR	○・無(年 月入手見込み)	
先方優先順位	9 件中 位	貴館優先順位	9 件中 位(注5)	新規・ 継続 要請(注6)	

I. 1. 要請案件の背景・目的・内容(調査対象の規模等具体的に記述すること)

急激な経済・工業開発及び発電力拡張計画の進展を理由に既存の電力供給体制が需要を満たせられず、停電が日常茶飯事となっている中、電力省は発電力拡張計画を再策定したが、その実施と併せて、既存の電力供給体制のリハビリテーション、右運用・維持面での効率向上が急務となっているため、本件調査要請がなされたものである。

2. 具体的調査項目(箇条書きで記述すること)(注7)

1. 電力の需要と供給の関係に係る調査
2. 電力需要の予測に係る調査
3. 電力開発及び電力供給体制に係る調査、並びに費用算出
4. 主要発電所のリハビリテーションに係る調査、並びに費用算出
5. 発電所運用・維持のための訓練計画策定に係る調査、並びに費用算出

3. 要請に至るまでの経緯(注8)

シリア側は平成4年度の開発調査要請案件として「電力訓練センター設立計画」(F/S)を要請、本年2月、鉱工業プロジェクト選定確認調査団との間で、リハビリテーションの調査(M/P)の中で訓練計画を取り上げることに合意した。

(注9) プロファイ署名 (三 月)

4. 我が国・第3国・国際機関の経済技術協力等との関係(要請・実施中・実施済みの案件)
(注10)

本件無償資金協力の要請あり。

5. 調査対象地域の治安状況

良好、特に問題なし。

6. 事業実施の可能性(注11)

(特に、D/D、アフターケア調査に関しては必ず記載)

算定事業費:

資金ソース: 円借、~~無償~~ 自己資金、世銀、その他()、未定

貴館の評価: 既に本件に係る無償資金協力要請がなされており、最優先案件として

ご検討願いたい。

II. その他関連情報

III. 貸付総合評価・所見 (注12)

(可能な限り貸地 JICA、OECD 事務所の見解も認取のこと)

高い人口増加率及び市場経済体制への移行期に伴う経済・工業の発展を背景に、電力の供給が需要に追いつかず、停電が日常茶飯事化している状況の下、シリア政府は近年、国家開発計画の最優先課題として発電能力の拡大に努めてきている。我が国はこれまでパニヤス火力発電所増設計画、ジャンダル火力発電所建設計画に対して円借款を供与した他、新規発電所建設計画に対する円借款の要請を受けている。これら我が国の資金協力で増設・建設された発電所を将来にわたり効果的に運用・維持せしめるためにも、リハビリテーション及び訓練の重要性は極めて高いと思料され、当館としても、無償資金協力との連携を考慮に入れた本件開発調査の実施を強く望むものである。

(調査対象地図等) 必ず添付のこと (注13)

別紙

TERMS OF REFERENCE
OF
MASTER PLAN STUDY
ON
REHABILITATION & MANPOWER TRAINING FOR POWER PLANTS IN SYRIA

1994

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1. INTRODUCTION

Due to rapid economic and industrial development and delay of electric power development, the existing power supply system is not enough to cope with its demand. Therefore, power shortage have been a familiar feature of Syrian life in recent years, with daily power cuts for four (4) or five (5) hours at capital DAMASCUS and for about ten (10) hours at other district not uncommon. In order to cope with this serious implications for industry and public use, Ministry of Electricity made power development plan as shown in the attached sheet.

On the other hand, in order to meet the rapidly growing demand for electricity and to keep system reliability in service, existing power supply system such as power plant, substation and power transmission lines are required to rehabilitate urgently.

At the same time the system shall be renovated and modernized to improve its efficiency of operation and maintainability.

2. OBJECTIVE OF THE STUDY

The objective of the study is to formulate optimum rehabilitation, renovation and modernization plan of the existing power plants covering whole country.

The priority of project implementation shall also be studied with project implementation cost to be required.

3. SCOPE OF THE STUDY

3.1 Power demand and Supply

Following items related to power demand and supply shall be investigated.

(1) Present Power demand

The power demand in the system including private sector and other consumers shall be investigated and classified individually.

(2) Present generation facility and actual capability

Present generation facility and its actual capability including private sectors shall be investigated.

(3) Daily load duration curve.

3.2 Power Demand Forecast

Based on the economic growth, industrial development plan and transmission line expansion program, the demand forecast shall be studied.

3.3 Plan of Power Development and Power Supply System

Latest plan of power development and power supply system shall be studied carefully together with cost investment.

3.4 Rehabilitation of Major Power Plants

- (1) Improvement of availability factor of each plant
- (2) Recovery of efficiency of each plant
- (3) Environmental study on each plant
- (4) Priority of rehabilitation

3.5 Training of operation and maintenance staffs for Power Plants

- (1) Study the necessity of man power training
- (2) Scope of training
- (3) Necessary facilities for training
- (4) Management of training

3.6 Cost of project Implementation

Cost on each project implementation of rehabilitation and training shall be studied.

4. SCHEDULE OF MASTER PLAN STUDY

To be discussed later on.

5. GENERAL INFORMATION FOR STUDY

See attached Sheet.

6. UNDERTAKINGS OF THE GOVERNMENT OF SYRIA

The government of Syria shall accord privileges, immunities and other benefits to the JICA Study team and, through the authorities concerned, take necessary measures to facilitate the smooth implementation of the study.

6.1 Ministry of Electricity shall make necessary arrangements with the cooperation of other relevant organisations for the following:

- (1) To secure the safety of the JICA study team.
- (2) To permit the members of JICA study team to enter, leave and sojourn in Syria for the duration of their assignment therein and exempt them from alien registration requirements.
- (3) To exempt the members of the JICA study team from taxes, duties and other charges on equipment, machinery and other materials brought into Syria for the implementation of the Study.
- (4) To arrange customs clearance handling and storage at the airport and custody of equipments, machines, tools and other articles to be brought into Syria for the implementation of the Study.

(5) To exempt the members of the JICA study team from income tax and other charges of any kind imposed on or in connection with any emolument or allowance paid to the members of the JICA study team for their services in connection with the implementation of the study.

(6) To secure permission to take all data, documents (including photographs) and materials related to the Study to Japan.

(7) To provide medical services as needed. Its expenses will be chargeable on the members of the study team.

6.2 Ministry of Electricity shall, at its own expenses, provide the JICA study team with the followings, in cooperation with other agencies concerned, if necessary.

(1) Available data, information and materials related to the study.

(2) Counterpart personnel consisting of engineers.

(3) Suitable office space with necessary equipment in Damascus.

(4) Necessary official use cars for the implementation of the study.

(5) Credentials or identification cards.

7. UNDERTAKINGS OF THE GOVERNMENT OF JAPAN

For the implementation of the Study, the Government of Japan shall, through JICA, in accordance with the relevant laws and regulations in force in Japan, take the following measures:

(1) To dispatch, at its own expenses, JICA study team to Syria.

(2) To perform technology transfer to the Syrian personnel in the course of the Study.

GENERAL INFORMATION FOR STUDY

(Example)


1. Technical data of major power plant
2. Technical data of major substation
3. Technical data of major transmission line
4. Present power demand and supply
5. Power demand forecast
6. Power transmission map.

署名したS/W

SCOPE OF WORK
FOR
MASTER PLAN STUDY
ON
REHABILITATION & MAN POWER TRAINING FOR POWER PLANTS
IN
THE SYRIAN ARAB REPUBLIC
AGREED UPON BETWEEN
MINISTRY OF ELECTRICITY
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Damascus, July 7th, 1994

Mr. Eng. Sufian Allaw
Deputy Minister,
Ministry of Electricity (MOE)



Mr. Norio Shimomura
Team Leader,
The Preparatory Study Team,
Japan International
Cooperation Agency (JICA)

I. INTRODUCTION

In response to the request of the Government of the Syrian Arab Republic (hereinafter referred to as "Syria"), the Government of Japan decided to conduct Master Plan study on Rehabilitation & Man Power Training for Power Plants (hereinafter referred to as "the Study") in accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of Syria signed on July 18th, 1985 (hereinafter referred to as "the Agreement").

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of Syria.

The present document sets forth the scope of work with regard to the Study.

II. OBJECTIVES OF THE STUDY

The objective of the Study is to formulate the optimum urgent plan for rehabilitation and renovation of the major existing thermal power plants in Syria.

The Study also covers study of man power training for operation and maintenance, in order to improve on effective and efficient use of thermal power plants in Syria.

III. STUDY AREA

The national territory of Syria. (135,130km²)

IV. SCOPE OF THE STUDY

The Study consists of the following three parts.

- (Part1) : Macro Framework Study for Master Plan
- (Part2) : Master Plan Study on Rehabilitation & Renovation of existing thermal power plants
- (Part3) : Study on Man Power Training for Operation & Maintenance

The details of the Study in the respective parts is phased and itemized as follows.

(Part1) : Macro Framework Study for Master Plan

[Phase1] Data collection and site surveys

- (1) Study on socio-economic structure and power demand
- (2) Study on energy and environmental preservation policy
- (3) Study on existing power supply system
 - including site survey of existing power plants
- (4) Study on power development plan and investment program
- (5) Study on institutional framework

[Phase2] Review and analysis of the following plan

- (1) Review and analysis of power demand forecast
- (2) Review and analysis of power supply extension plan
- (3) Review and analysis of power development plan and investment program
- (4) Review and analysis of power generation plan of each plants
- (5) Review and analysis of institutional framework

Based on Macro Framework Study carried out in (Part1) mentioned above, both of the Study, (Part2) and (Part3) , will be carried out.

[Part2] : Master Plan Study on Rehabilitation & Renovation of existing thermal power plants

[Phase1] Identification of target power plants

- (1) Review of existing thermal power plants
- (2) Pre-evaluation and identification of priority plan
- (3) Selection of urgent priority power plants

[Phase2] Investigations and alternative analysis

- (1) Investigations of selected power plants
- (2) Preparation of alternatives for Rehabilitation and Renovation
- (3) Analysis of alternatives including initial environmental examination

[Phase3] Preparation of plan for Rehabilitation and Renovation

- (1) Conceptual design and cost estimate
- (2) Economic and financial analysis
- (3) Preparation of Recommendations

[Part3] : Study on Man Power Training for Operation & Maintenance

[Phase1] Study on improvement for O&M system

- (1) Review of existing Operation & Maintenance system of existing plants
- (2) Analysis of improvement for O&M system of existing plants

[Phase2] Preparation of concept for man power training

- (1) Review of existing man power training system of P.E.G.T.
- (2) Identification of man power training necessity and scope
- (3) Identification of training approach and management

[Phase3] Preparation of man power training program

- (1) Conceptual design and cost estimate
- (2) Analysis of institutional framework
- (3) Preparation of Recommendations

V. STUDY SCHEDULE

The Study will be implemented in accordance with the tentative time schedule as shown in Appendix I attached hereto.

VI. REPORTS

JICA will prepare and submit the following reports in English to the Government of Syria in accordance with the tentative time schedule as shown in Appendix I.

1. Inception Report 30 copies
2. Progress Report 30 copies
3. Interim Report 30 copies
4. Draft Final Report 30 copies

The Ministry of Electricity (hereinafter referred to as "MOE") will provide JICA study team with the comments on the Inception Report, Progress Report, Interim Report during their stay in Syria. And in the case of the MOE will provide JICA HDQ with the comments on the Draft Final Report within one (1) month after receipt of the report.

5. Final Report 50 copies

VII. DIVISION OF TECHNICAL UNDERTAKINGS

The division of technical undertakings by MOE and JICA of the Study is detailed in the Appendix II.

VIII. UNDERTAKINGS OF THE GOVERNMENT OF SYRIA

1. The Government of Syria shall accord privileges, exemptions and other benefits to the Japanese study team (hereinafter referred to as "the Team") in accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of Syria.

2. To facilitate smooth conduct of the Study, the Government of Syria shall take necessary measures:

- (1) to secure the safety of the Japanese study team,
- (2) to permit the members of the Japanese study team to enter, leave and sojourn in Syria for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees,
- (3) to exempt the members of the Japanese study team from taxes, duties and other charges on equipment, machinery and other materials brought into Syria for the conduct of the Study,
- (4) to exempt the members of the Japanese study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese study team for their services in connection with the implementation of the Study,
- (5) to provide necessary facilities to the Japanese study team for remittance as well as utilization of the funds introduced into Syria from Japan in connection with the implementation of the Study,
- (6) to secure permission for entry into private properties or restricted areas for the implementation of the Study,
- (7) to secure permission for the Japanese study team to take all data and documents, maps, photographs related to the Study out of Syria to Japan,
- (8) to provide medical services as needed. Its expenses will be chargeable on members of the Japanese study team,

3. The Government of Syria shall bear claims, if any arises, against the members of the Japanese study team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Japanese study team.

4. Ministry of Electricity shall act as counterpart agency to the Japanese study team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

5. MOE shall, at its own expenses, provide the Japanese study team with the followings, in cooperation with other organizations concerned:

- (1) available data, information and materials related to the Study,
- (2) counterpart personnel,
- (3) suitable office space with necessary equipment in Damascus and the project site,
- (4) credentials or identification cards,
- (5) appropriate vehicles with drivers, fuel and spare parts for carrying out the field survey,
- (6) communication facilities during the implementation of the Study, such as telephone, telex, fax, transceiver, etc.
- (7) necessary labour for the Study.

IX. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures:

1. to dispatch, at its own expense, JICA study team to Syria,
2. to pursue technology transfer to the MOE counterpart personnel in the course of the Study.

X. CONSULTATION

JICA and MOE shall consult with each other in respect of any matter that may arise from or in connection with the Study.

APPENDIX I TENTATIVE TIME SCHEDULE LEGEND: JICA WORK IN SYRIA MOE WORK IN SYRIA JICA WORK IN JAPAN

CALENDER YEAR M O N T H CALENDER MONTH	1 9 9 5											
	1	2	3	4	5	6	7	8	9	10	11	
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	
Workshop	○											
(Preparation work)	○											
(Part 1) Macro Framework Study (Phase1) Data collection and site surveys (Phase2) Review and analysis												
(Part 2) M/P Study on rehabilitation & Renovation (Phase1) Identification of target power plants (Phase2) Investigations and alternative analysis (Phase3) Preparation of plan												
(Part 3) Study on ManPower Training for Operation&Maintenance (Phase1) Study on improvement for O&M system (Phase2) Study on cocept for man power training (Phase3) Preparation of program												
(Reports)												
1. Inception Report 2. Progress Report 3. Interim Report 4. Draft Final Report 5. Final Report	ICA		PRI△			ITA			DFA		ERA	

APPENDIX II DIVISION OF TECHNICAL UNDERTAKING (1)

Working Item	Contribution by MOE	Contribution by JICA
<p>(Preparation Work)</p>	<p>-Assignment of Counterpart -Preparation of existing data, information and relevant materials</p>	<p>-Assignment of Technical Study Team</p>
<p>(Phase I) Site Survey and Data Collection for Power Study</p> <ol style="list-style-type: none"> 1) Socio-economic Study 2) Power Demand Study 3) Energy Study for Power Generation 4) Environmental Preservation Policy Study 5) Power Supply System Study 6) Institutional Study such as Regulation, Administration and Organization 7) Investment Potential Study 	<p>-Provision of existing data, information and relevant materials -Dispatch of counterpart personnel to the site -Necessary arrangement -Instruction of basic policy of Energy and Environmental Preservation -Instruction of Investment Program for Power Sector</p>	<p>-Review and analysis of existing data and information -Review of Socio-economic Structure -Review of Power Demand -Review of Energy Potential for Power Generation -Review of Environmental Preservation Policy -Review of Existing Power Supply System and Supply Plan -Examination of Major Power Facilities -Review of Regulation, Administration, Organization and Management -Review of Investment Program for Power Sector -Proposed Site Survey and Investigation</p>

APPENDIX 11 DIVISION OF TECHNICAL UNDERTAKING (2)

Working Item	Contribution by MOE	Contribution by JICA
<p>(Phase2] Planning and Proposed Projects Formation for Alternative Study</p> <p>1) Power Development Plan</p>	<ul style="list-style-type: none"> -Provision of necessary data and information -Instruction of basic policy 	<ul style="list-style-type: none"> -Study and Formulation of Plan
<p>2) Rehabilitation Plan and Proposed Projects Conceptual Design Initial Environmental Examination Cost Estimation</p>	<ul style="list-style-type: none"> -Provision of necessary data and information -Instruction of basic policy for planning -Selection of proposed projects 	<ul style="list-style-type: none"> -Study and Formulation of Plan -Identification of Proposed Projects includings Projects design, Initial Environmental Examination and Cost estimation
<p>3) Generation Plan</p>	<ul style="list-style-type: none"> -Provision of necessary data and information -Instruction of basic policy 	<ul style="list-style-type: none"> -Study and Formulation of Plan
<p>4) Operation and Maintenance Plan</p>	<ul style="list-style-type: none"> -Provision of necessary data and information -Instruction of basic policy 	<ul style="list-style-type: none"> -Study and Formulation of Plan
<p>5) Training Plan and Proposed Project</p>	<ul style="list-style-type: none"> -Provision of necessary data and information -Instruction of basic policy -Selection of proposed projects 	<ul style="list-style-type: none"> -Study and Formulation of Plan -Identification of training project includings Necessity, Scope, Facility and Management
<p>6) Project Evaluation</p> <ul style="list-style-type: none"> -Economic/Financial Aspect -Environmental/Social Impact Aspect 	<ul style="list-style-type: none"> -Provision of necessary data and information 	<ul style="list-style-type: none"> -Comparative Study and Evaluation of Projects

APPENDIX II DIVISION OF TECHNICAL UNDERTAKING (3)

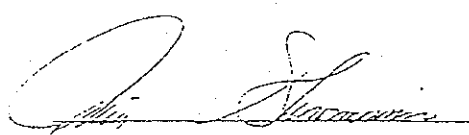
Working Item	Contribution by MOE	Contribution by JICA
<p>[Phase3] Priority Study and Investment/Implementation Program</p> <p>1) Priority Study</p> <p>2) Institutional Arrangement</p> <p>3) Investment Program</p> <p>4) Implementation Program</p>	<p>-Provision of necessary data and information</p> <p>-Instruction of basic policy</p> <p>-Confirmation</p> <p>-Provision of necessary data and information</p> <p>-Instruction of basic policy</p> <p>-Confirmation</p> <p>-Provision of necessary data and information</p> <p>-Instruction of basic policy</p> <p>-Confirmation</p> <p>-Provision of necessary data and information</p> <p>-Instruction of basic policy</p> <p>-Confirmation</p>	<p>-Study and Formulation of Plan</p> <p>-Study and Formulation of Arrangement</p> <p>-Study and Formulation of Program</p> <p>-Study and Formulation of Program</p>

署名したM/M

MINUTES OF MEETING
FOR
THE MASTER PLAN STUDY
ON
REHABILITATION & MAN POWER TRAINING FOR POWER PLANTS
IN
THE SYRIAN ARAB REPUBLIC
AGREED UPON BETWEEN
MINISTRY OF ELECTRICITY
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Damascus July 7th, 1994

Mr. Eng. Nazih Yanes
Technical Advisor,
Ministry of Electricity (MOE)



Mr. Norio Shimomura
Team Leader,
The Preparatory Study Team,
Japan International Cooperation
Agency (JICA)

The JICA preparatory study team (JICA) for the Master Plan Study on Rehabilitation & Man Power Training For Power Plants in Syria (hereinafter referred to as "the Study") visited the Syrian Arab Republic from July 1st to 3th, 1994 and had a series of meetings with the Ministry of Electricity (MOE) regarding with the objectives and the scope of the study based on the Terms of Reference (TOR) prepared by MOE in April 1994.

This Minutes of Meeting summarized the result of the discussions as follows:

1. Background of the Study

Rapid population growth, Suceceful economic development, and also delay of electric power development created the problem of power shortage, which has been constraint of future economic development, particularly in the industrial sector changing into a market oriented economy.

In recent years, power shortage has been a well-known feature of Syrian life with daily power cuts about five hours at capital Damasucus and other district.

According to the National Development Policy, Ministry of Electricity is just making utmost efforts to develop new power stations, in order to cope with this serious situation.

On the other hand, existing power supply system such as power plant, substation and transmission lines are required to be rehabilitated urgently to keep the system reliability in service because of full-time operation. At the same time, the system shall be renovated to improve its effeciency.

Human development for operation and maintenance of power supply system is the first priority subject of MOE.

2. Characteristics of the Study

Target projects are divided into two portions as followings:

1) Rehabilitation of existing thermal power plants

In this study, rehabilitation of hydropower generations, transmission lines, sub-stations, and distribution lines is out of scope.

As for the exisiting thermal power generation plants, which are now full-time operating and need to be rehabilitated urgently, MOE are expected to formulate master plan in cooperate with JICA.

2) Effective use of thermal power generation plants

It should be kept in mind that it is long-term subject to train staff for operation and maintenance of power plants. Improvement on effectiveness of operation and maintenance needs continuing efforts of proper management in respective power plants.

It is important to clear both what kind of major problems to be improved and what kind of factors to be refrained there are in the existing operation and maintenance system.

3. Objective of the Study

The ultimate objective of the study is to prepare the optimum urgent plan of rehabilitation and renovation for existing major thermal power plants and also to study of man power training for operation and maintenance of thermal power plant, in order to improve on effective and efficient use of thermal power plants.

4. Scope of the Study

The Study consists of the following three parts.

- 1) Macro Framework Study for Master Plan
- 2) Master Plan Study on Rehabilitation & Renovation of existing thermal power plants
- 3) Study on Man Power Training for Operation & Maintenance

5. Organizational framework for the Study

MOE/PEGT is the counterpart organization for JICA to consult each other in respect of any matter in connection with the Study and should establish the Study Task Force Team (counterpart personnel) within MOE/PEGT at earliest timing during the Study for effective technology transfer.

And also the MOE/PEGT should be the sole responsible and executing agency for the implementation of the Study through Task Force Team (TF) and should play a role of coordination agency for Steering Committee (SC) in the Syrian side before commencement.

Task Force Team of electric power experts will consist of the representative of the MOE/PEGT and other electric power relating authorities and will be directly responsible for counterparting the JICA Study team for all technical matters.

Steering Committee of decision makers will consist of the representative of the MOE/PEGT and other relating authorities and will give guidance and suggestions to the JICA Study team through Task Force Team.

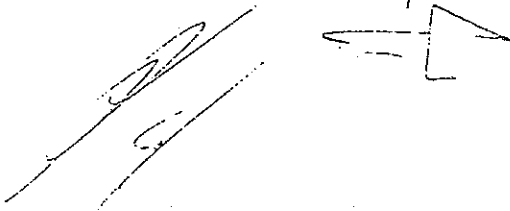
Draft organization chart is attached to this minutes of meeting. The draft will be elaborated further. Attachment 1!

6. Provision of necessary data

Substantial efforts will be required to collect necessary/reliable information for the Study from various organizations such as PEGT and etc..

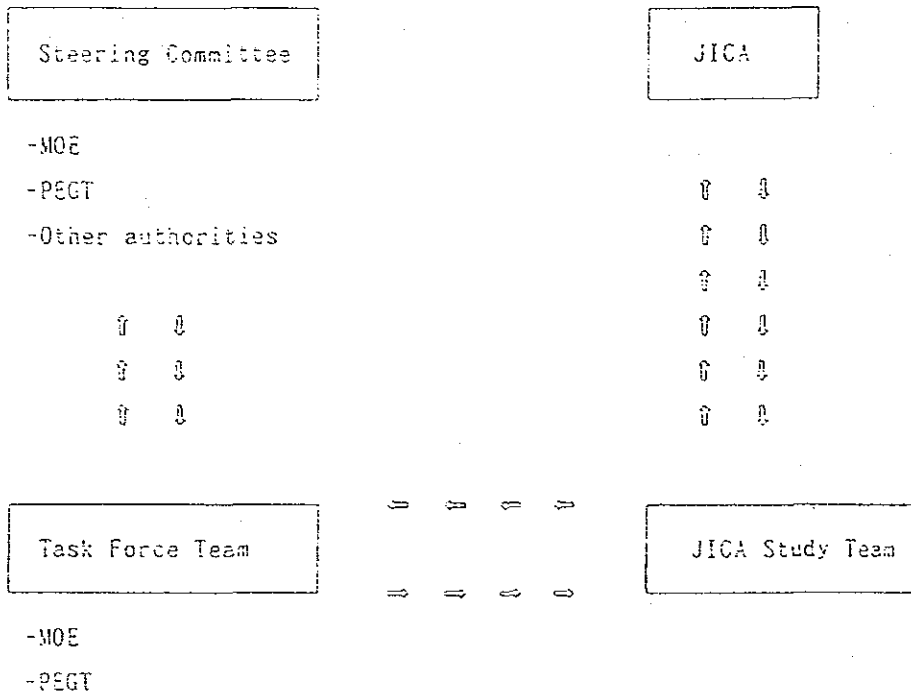
JICA has prepared the questionnaire table of the sets of data necessary for the Study and was informed the data availability and its sources by MOE/PEGT.

MOE/PEGT will be supposed to gather all the available data and to provide them to the JICA study team through JICA Syria office until beginning of the Study.

A handwritten signature in dark ink is located on the left side of the page. To its right is a simple hand-drawn arrow pointing to the right.A small, handwritten mark or initials in dark ink is located in the bottom right corner of the page.

Draft Organization chart

(Attachment 1)



[Handwritten signatures and marks]

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第9章 本格調査の留意事項

第9章 本格調査の留意事項

9-1 開発調査について

シリアではJICAの開発調査はほぼ初めての経験であり、スキームを十分理解しているとはいえない。また、データ整理状況から判断するとこれまでほとんど同省では、計画策定を行ってこなかったようである。各節目ごとにワークショップを開催し十分関係者に理解を深めていく必要がある。

9-2 ECとの関係について

シリアは歴史的にもECとの関係が深く、同地域における協力も日本に比べ経験が豊富である。電力セクターにおいても送配電における協力を10月から予定しており、情報交換等関係を深めていく必要がある。

9-3 既存火力発電所のリハビリM/Pについて

バニアス火力発電所No. 3は今年11月頃定期点検を予定している。提出された主要火力発電所のリストから、事前に対象火力発電所の検討を行い、絞り込みを行う必要がある。

9-4 訓練センターにおける調査について

サイトの選定について、次官からジャングールが位置的によいのではとの発言があった。しかし、本調査の中でいくつかの候補地点を設定し比較検討を行い提言をしてもらいたいとのこと。また、円借款で今年度ジャングールに搬入される予定のシミュレータ（ST及びC）をどのように位置付けるかも検討する必要がある。

9-5 調査の重点項目について

今回の予備調査で得られた知見をベースに下記の点についてさらに詳細に調査確認を必要とする。

- (1) 電力設備リハビリテーションについては、マハルディ火力発電所（4缶全部）及びバニアス火力発電所（1、2号缶）等大容量設備を優先的に調査することが効果的である。
- (2) Kateneh 発電所の視察も実施し今回のサイト視察と併せた成果を挙げること。
- (3) 運転員の保守管理能力向上策として、シミュレータによる指導を推奨するとともに実プラントの改善提案に積極的に取り組むような管理システムの導入を検討して欲しいこと。

- (4) ジェンダール火力発電所の運転開始後には電力供給に一時的にせよゆとりができると考えられるので、定期点検補修の基準をMOE内規としてでも策定・実行するよう提案して欲しいこと。

9-6 調査用資機材について

本格調査において、ボイラー・タービン及び発電機等の火力発電設備の詳細調査を効率的に実施するためには、次の計測機器が必要であると考えられる。

資 機 材 名	仕 様	数量	購入期限
超音波探傷装置	デジタル式 バッテリー、充電機100V トランス、遮光ノート、 薄肉用ブロック、ケーブル キャリングケース、ハロゲンランプ 接触媒質共	一式	第一次現地調査 出発前
内視鏡 (ファイバースコープ)	光源装置、カラーテレビシステム テレビモニター共	一式	同 上
ポータブル水質計	スペアパーツ、アダプター トランス、テストピース共	一式	同 上

9-7 カウンターパート日本研修について

本格調査において、先方から日本研修が要請された場合は、開発調査における技術移転の視点から時期・内容・行程等を十分考慮のうえ計画を策定し、研修を行う。

第10章 関連情報の整備状況

第10章 関連情報の整備状況

10-1 予備調査団の収集資料リスト

今回の予備調査にあたっては56点の資料を収集する事が出来た。入手した資料を一覧表にした資料リスト(表-10.1)を示す。

10-2 質問表及び回答

今回の予備調査にあたっては、事前に日本で作成した質問表をシリア側に送ってあったので現地での協議にあたってはデータの整備状況、今後の収集の可能性に関してスムーズに回答を入手することができた。ただ、別添に示す質問表の入手可能性(Availability)欄のPossible(△)は、MOEの回答をそのまま掲載してあるが、本格調査にあたっては当該資料を確実に入手できるように努力を必要とする場合もあり得る。

質問表及び回答を別添に示す。

資料収集リスト

表-10.1 資料リスト (収集資料)

地域	中近東	調査団名	発電設備リハビリ・人材育成計画調査	調査の種類	予備調査			
国名	ヨリ・ワフ	配属機関	電力省 (MOE)	現地調査期間	1994年 6月30日～1994年 7月10日			
番号	資料の名称	版型	頁数	原・写	収集先名称/発行機関	入手法	取扱区分	利用表示
1	電力省組織図 (MOE)		1	写本	シリア電力省	寄贈	JR	
2	発電電公社組織図 (PEGT)		1	写本	シリア電力省	寄贈	JR	
3	配電公社組織図 (PEDE)		1	写本	シリア電力省	寄贈	JR	
4	Statistical Abstract		521	原本	シリア電力省	寄贈	JR	
5	シリアの経済社会の現状		67	写本	(財)国際協力推進協会	寄贈	JR	
6	国家行政組織図 (シリア)		6	写本	JICA	寄贈	JR	
7	シリア短期滞在者のための手引き		1	写本	JICA Syria	寄贈	JR	
8	世界の電気事業・シリア編		5	写本	海外電力調査会	寄贈	JR	
9	シリア電力事情		22	写本	在シリア日本国大使館	寄贈	JR	
10	Electric Power Efficiency Study		146	写本	World bank/UNDP	寄贈	JR	
11	Public Establishment for Electricity-PEE 91		16	原本	PEE	寄贈	JR	
12	F/S on Combined Cycle Power Station Project		1	写本	MOE	寄贈	JR	
13	Electric Prices		3	写本	MOE	寄贈	JR	
14	シリア送電マップ/系統図		1	写本	MOE	寄贈	JR	
15	火力発電設備概要		1	写本	PEGT	寄贈	JR	
16	サウラ水力発電所概要		1	原本	サウラ水力発電所	寄贈	JR	
17	Banias Power Station Maintenance Checklist		4	原本	Banias Power Station	寄贈	JR	
18	Jandar 火力発電所配置図		1	写本	三菱重工	寄贈	JR	
19	Oil and Gas Production		2	写本	MOE	寄贈	JR	
20	The Environment Protection Act		46	写本	シリア環境省	寄贈	JR	
21	The Europe-south Dialogue in Practice		120	原本	EC	寄贈	JR	
22	Electricity Sector Support Project		11	写本	EC	寄贈	JR	
23	INVESTMENT LAW AND IMPLEMENTORY INSTRUCTIONS		48	写本	JICA Syria	寄贈	JR	

番号	資料の名称	版型	頁数	原・写	収集先名称/発行機関	入手法	取扱区分	利用表示
24	Actual Condition of Cogeneration in Japan		15	原本	J E P I C	寄贈	J R	
25	THERMAL POWER AND ENVIRONMENTAL POLLUTION CONTROL		61	原本	J E P I C	寄贈	J R	
26	西ドイツにおける火力発電運用と運転員教育		106	原本	海外電力調査会	寄贈	J R	
27	供給者(メーカー)		2	写本	海外電力調査会	寄贈	J R	
28	Life Evaluation of Thermal Power Plant in-Service E		8	写本	Hitachi Review Vol.36, No.6	寄贈	J R	
29	Training		9	写本	海外電力調査会	寄贈	J R	
30	Changes in The System of Thermal P.S Management		7	写本	海外電力調査会	寄贈	J R	
31	火力発電設備の運転支援システム		7	写本	日立評論 Vol.69 No.10	寄贈	J R	
32	火力発電設備の総合予防保全システム		8	写本	日立評論 Vol.72 No.8	寄贈	J R	
33	既設発電設備の寿命診断		6	写本	日立評論 Vol.69 No.10	寄贈	J R	
34	ボイラの予防保全技術		8	写本	日立評論 Vol.72 No.8	寄贈	J R	
35	タービンの予防保全技術		8	写本	日立評論 Vol.72 No.8	寄贈	J R	
36	熱交換器の予防保全技術		6	写本	日立評論 Vol.72 No.8	寄贈	J R	
37	ポンプ設備の予防保全技術		8	写本	日立評論 Vol.72 No.8	寄贈	J R	
38	発電機の予防保全技術		8	写本	日立評論 Vol.72 No.8	寄贈	J R	
39	高圧誘導電動機の予防保全技術		8	写本	日立評論 Vol.72 No.8	寄贈	J R	
40	送変電設備の予防保全システム		8	写本	日立評論 Vol.72 No.8	寄贈	J R	
41	制御装置の予防保全技術		6	写本	日立評論 Vol.72 No.8	寄贈	J R	
42	電力設備診断技術の動向		8	写本	電気評論 1987.6	寄贈	J R	
43	火力発電所運転支援システム		4	写本	電気評論 1988.4	寄贈	J R	
44	既設火力の長寿命化計画		5	写本	電気評論 1988.4	寄贈	J R	
45	ボイラ・タービンの診断技術		7	写本	電気評論 1987.6	寄贈	J R	
46	訓練用シミュレータの現状と動向		9	写本	電気評論 1987.3	寄贈	J R	
47	火力発電所		4	写本	電気評論 1987.3	寄贈	J R	
48	Statistical Handbook-1993-94		37	原本	J E P I C	寄贈	J R	
49	火力発電所管理体制の変遷		6	写本	海外電力調査会	寄贈	J R	

番号	資料の名称	版型	頁数	原・写	収集先名称/発行機関	入手法	取扱区分	利用表示
5 0	火力発電運転員研修		9	写本	海外電力調査会	寄贈	J R	
5-1	Training		9	写本	海外電力調査会	寄贈	J R	
5 2	火力ハンドブック(運転及び保守訓練センター)		8	写本	通産省資源エネルギー庁編	寄贈	J R	
5 3	火力ハンドブック(ボイラ保守点検)		8	写本	通産省資源エネルギー庁編	寄贈	J R	
5 4	火力ハンドブック(タービン保守点検)		6	写本	通産省資源エネルギー庁編	寄贈	J R	
5 5	北米における経年火力発電所の保守		100	原本	海外電力調査会	寄贈	J R	
5 6	米国・火力発電所の保守技術員の教育		23	写本	海外電力調査会	寄贈	J R	
5 7	SYRIA ROAD MAP FOR TOURISTS		1	原本	M O E	寄贈	J R	

質問表及び回答

(QUESTIONNAIRE)

THE SYRIAN ARAB REPUBLIC

QUESTIONNAIRE

ON

MASTER PLAN STUDY

OF

REHABILITATION & MAN POWER TRAINING FOR POWER PLANTS

JUNE 1994

JAPAN INTERNATIONAL COOPERATION AGENCY

COVER

CONTENTS

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1. General	1
2. Power Study	2
3. Energy study	3
4. Environment	3
5. Economic/ Financial Evaluation and others	4

LEGEND:

Availability Column

- : Available Now
- △ : Possible (Copy)
- X : Impossible

Abbreviation

- MOE : Ministry of Electricity
- PEGT : Public Establishment for Generation and Transmission of Electricity
- PEDE : Public Establishment for Distribution and Exploitation of Electricity
- CBS : Central Bureau for Statistics
- MOEV : Ministry of State for the Environment

Main Item	Sub-item	Availability	Source etc.
1. General			
1-1 National Land and Natural Condition	Whole Syria/ Major City	△	PEGT
Maps	Meteorological Records	△	PEGT
Weather	Area/ Physical Features	△	PEGT
Land use			
1-2 Socio-Economic Conditions			
Administrative division	Prefectures	△	CBS
Population and household	Urban/Village Age/Sex	△	CBS
Household spending and saving			
National Budget			
GDP			
Major Industries	Agriculture/Manufacture/ Service	△	CBS
Transportation	Location/ Capacities/ Output	△	CBS
Communication	Road/Rail/Air/Ship	△	CBS
Education	Postal/ Telephone/ Newspaper/ TV	△	CBS
Medical	School/ Teacher/ Student	△	CBS
International Balance of Payments	Medicalcare facilities	△	CBS
Trade	Export/Import	△	CBS
Consumers Price Index/ Whole Price Index		△	CBS
Exchange rate/ Official discount rate		△	CBS
Monetary supply/ Inflation rate		△	CBS
1-3 Law and Regulations			
Constitution of Syria			
1-4 Organization and Management			
Organization chart of Central Government	Head office/ Local office/ Employees	△	CBS
Organization chart of MOE	Manager/ Engineer /Administrator	△	MOE
Counterpart for the Project	Annual Report	△	MOE
Ministry of MOE	Tariff system/ Balance sheet	△	MOE
Financial Condition of MOE			
1-5 Development Plan and Investment			
Social, Economic and Industrial development plan	Recently 5years Development plan and Investment program	△	
Power development plan	Recently Development plan and Investment program	△	
Interest rate or other conditions of available funds for power development	Islamic Development Fund	△	

Quest. 2

Main Item	Sub-Item	Availability	Source etc.
2. Power Study 2-1 General Power development policy Electrification policy Organization chart	Long-term Demand and Supply MOE/ P. E. C. T. / P. E. D. E. Aleppo Technical College	△ ○	PEGT MOE
2-2 Power Demand Forecast Forecasting method Major Power Consumption Industries Domestic electric appliances	Household/ Industry/ Commercial/ Pub Cement/ Refinery Spread rate	△ △ △	PEGT PEDE PEDE
2-3 Power Supply System Supply area and Self-generation Transmission System/ International connect Sub-station and Distribution Existing Power Plants -Hydropower/ Thermal/ Gas-turbine	Standard voltage Energy loss General characteristics of facilities Annual generation Daily load curve/ Peak load Operation records of existing plants -Generation kwh/ Station service kwh -Operation hour -Kind of fuel/ fuel consumption -Steam condition -Plant efficiency -Record of fault/ Countermeasure -Retirement Schedule	○ △ △ △ △	PEGT/PEDE PEGT/PEDE PEGT/PEDE PEGT
2-5 Countermeasure for environmental preservation and future plan	Dust collection Waste water/ Noise and vibration		MOEV
2-4 Operation and Maintenance System	Operation & maintenance organization Stock & purchase system of spareparts Maintenance cycle (Daily/ Periodical) Manual for O&M	△ △ △	PEGT PEGT PEGT
2-5 Man power training Program	Outline of existing training course Training program for O&M	Under Consideration	PEGT/PEDE
2-6 Rehabilitation plan		Under Consideration	PEGT

Main Item	Sub-Item	Availability	Source etc.
3. Energy Study 3-1 Energy policy	Long-term Energy Demand and Supply Energy conservation policy -Laws and regulations -Implementation program -Energy usage data currently measured	Under Consideration	
3-2 Energy consumption and Import		△	
3-3 Energy production	Primary Energy Supply Oil and gas fields Transportation system Refineries Distribution system	△ △ △ △ △	
3-4 Energy development plan	Oil/ Gas/ Hydro/ New Types of energy	△	
3-5 Energy price		△	
4. Environment Study 4-1 Environmental preservation policy	Laws and regulations Implementation program	△	MOEV
4-2 Environmental data currently measured	-Air pollution (SO/NO/Dust) -Water quality (COD/BOD/SS) -Garbage and industrial waste	△	MOEV

Main Item	Sub-item	Availability	Source etc.
5. Economic/ Financial Evaluation and others 5-1 Statistics year books	Population and growth rates Price escalation rates Taxes and duties	○ △ △	PEGT
5-2 Units costs	Labour cost -Daily working hours and wages -National holidays and religious holiday and etc -Premium payment for holiday and overtime work Wage payment -Secretary/ Clak/ Draftman/ Typist Service expenses -Telephone/ Fax/ Telex/ Copy Rental charge -Sedan/ Micro bus/ Jeep with driver -Gasoline/l.	△ △ △	PEGT
5-3 Unit construction costs of power supply facilities (/kw and /kwh)	Hydropower/thermal/gas-turbine/diesel	△	
5-4 Annual operation and maintenance cost/kwh	Hydropower/thermal/gas-turbine/diesel	△	
5-5 Study conditions	Transportation -Regional Map/ Road Map -Major port -Inland transportation from port Communication system -Telephone Fax Telex Security and health -Security Sanitation Disease and hospital	△	

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