Questionnaire

Feasibility Study on Rehabilitation

of

Da Nhim Power System

June 1993

Mission on Project Formulation in JICA

CONTENTS OF QUESTIONNAIRE

1. Electric Power Situations in Power Company No.2 (PC-2)

Item	Description	Availability	Notes
1.Existing Supply Facilities	- Power plants, substations(installed capacities) and transmission lines - Schematic and single line diagrams - Power plants for private use		
2.Demand and Supply Records	- Record of peak kW, kWh including load curve(annual, monthly and daily) and Index of economics(GNP, GDP,etc.) from 1973 to 1993 - Record of private use - Average Power demand(kW), annual power consumption(kWh) from 1973 to 1993 including load curve(annual, monthly and daily) 1)Residential 2)Commercial 3)Public and others 4)Industry 5)Total - Energy loss - Electrification rate		
3.Demand Forecast	- Long-term demand(max kW, kWh) forecast including load curve (annual, monthly, daily) from 1993 to 2020 and basis of forecast - Rural electrification program		
4.Supply Planning	- Installation capacity, firm output of each planning power plant from 1994 to 2020 including power plant for private use		
5.Expansion Planning on power supply network	- Transmission lines and substations		

2. Electric Power Situation in Da Nhim Power System

Item	Description	Availability	Notes
1. Existing Supply Facilities	- Power plants, substations (installed capacities) and transmission lines - Schematic and single line diagrams		
2. Demand and Supply Records	- Record of peak kW, kWh including load curve (annual, monthly and daily) from 1973 to 1993 - Energy loss		
3. Demand Forecast	- Long-term demand (max kW, kWh) forecast including load curve (annual, monthly, daily) from 1993 to 2020 and basis of forecast - Study report for future		
5. Expansion Planning on Power system	- Powerhouse, transmission lines and substations		
6. Past Records	- Past records 1) Technical specification 2) Hydraulic analysis 3) Structural analysis 4) Drawings 5) Setting records and commissioning tests 6) Operation records from 1964 to 1993 7) Inspection records 8) Fault records 9) Repairing records		

3. Topographic Map on Project Area

Item	Description	Availability	Notes
1.Topographic Map covering Project Area	- Scales 1:250,000 1: 50,000 1: 5,000 1: 1:		
2.Topography Map covering Transmission Line Route	- Scales 1: 50,000 1:		
3.Topographic Map covering Hydrological Data Acquisition System	- Scales 1: 50,000 1:		

4. Hydrological and Meteorological Data

Item	Description	Availability	Notes
1.Run-off	- All available data at water gauging stations including location map(s) - Converted run-off data at the dam site		
2.Flood Flow	- By physical method such as probable maximum method - By statistical method - Record maximum flood		
3.Sedimentation	- Suspended material and bed load material		
4.evaporation	- Monthly average (observed or estimated evaporation)		
5.Precipitation	- All available precipitation data for wet and dry seasons including location map(s) of stations		
6.weather	- Temperature, humidity and thunder(annual number of days per 10km square)		
7.Water Quality Record			
8.Water Temperature Record			

5. Planning Data

Item	Description	Availability	Notes
1. Development Plans of Da NHI Power System			
2. Regulation, Code, Criteria and so forth	- Civil work(dam, penstock, gate, etc.) - Building, machine and material - Communication		
3. Organization on Executing of Survey Work	- By PC-2 personnel directly or local contractors		
4. Results of Relevant Study Report	- Reports - Data		

6. Information on Progression of Power Development

Item	Description	Availability	Notes
1.Other Projects	- Information on other definite Projects in completion of F/S and D/D		

7. Inland Transportation Data(Between Harbor and Project Site)

Item	Description	Availability	Notes
1.Road Conditions	- Road map of transportation route		
2.Cost of Inland Transportation	- Cost of inland transportation US$/ton-km, US$/ton, US$/km or other unit prices - Hire charge of truck, car, barge, etc.		

8. Cost Estimation Data

Item	Description	Availability	Notes
1. Construction Cost	- Actual results of Construction Cost in similar Project recently completed including unit cost for main work items - Recent escalation rates - Data for exchange rates - Residual value - Discount rate		
2. Price List for Construction Work, Materials and Labours			

9. Economic Evaluation

Item	Description	Availability	Notes
1. Construction Cost for Various Types of Power Plants	- Coal-fired thermal power plant (US$/kW, US$/kWh) - Oil-fired thermal power plant (US$/kW, US$/kWh) - Gas turbine (US$/kW, US$/kWh) - Combined cycle (US$/kW, US$/kWh) - Hydroelectric power plant (US$/kW, US$/kWh)		
2. O & M Costs for Each Type of Power Plant			
3. Fuel Cost	- Coal; Heat rate, heat efficiency and unit cost (US$/ton) - Oil: Ditto (US$/bil) - Natural Gas: Ditto (US$/BTU)		
4. Current Electricity Tariff	- Tariff by type of consumers 1) Residential 2) Commercial 3) Public and others 4) Industry 5) Total		

1 0. Field Accommodation

Item	Description	Availability	Notes
1. Communication	- Telephone - Telex - Fax - Others /		
2. Lodging and Office Accommodation	- Lodging Accommodation - Office Accommodation		
3. Accessibility to the Project Area	- Conventional Route - Facilities - Time		
4. Security	- Security - Hygiene		
5. Labour Administration	- Labour working law or regulations and unions(if any) - Public or official holidays - Daily working hour		

Field Accommodation (continue)

Item	Description	Availability	Notes
6.Labour Cost	- Labour cost 1) Daily working time 2) Outdoor heavy work 3) Outdoor light work 4) House work 5) Premium payment for holiday and overtime working - Wage payment 1) Secretary 2) Clerk 3) Draftsman 4) Typist - Service expenses 1) Telephone 2) Telex 3) Others - Rental charge 1) Passenger car with driver and fuel 2) 4WD vehicle with driver and fuel		

1 1. Availability of Equipment for Field Investigation

Item	Description	Availability	Notes
1. Measurement Instrument and Testing Device	- Electric measuring instrument and/or testing device - Setting measuring instrument - Insulation test instrument and device - Others		

I 2. Others

Item	Description	Availability	Notes
1.Organization in Charge of and/or concerned to the Project	- Ministerial, regional, provincial Organization		
2.Related Departments	- Relations - Structures		
3.Implementing Agency on the Project	- Head office - Local office - Number of employees and engineering staff - Annual report		
4.List of PC-2 Counterpart	- To be included in the F/S study		

UỶ BAN KẾ HOẠCH
NHÀ NƯỚC

Số :1978 UB/KTĐN
V/v các đề án nghiên
cứu phát triển

CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

Hà nội, ngày 29 tháng 09 năm 1993

Kính gửi : Đại sứ quán Nhật bản

Uỷ ban Kế hoạch Nhà nước nước C.H.X.H.C.N. Việt nam xin gửi đến Đại sứ quán Nhật bản lời chào trân trọng và hân hạnh được thông báo vấn đề sau :

1- Uỷ ban Kế hoạch đề nghị Chính phủ Nhật bản giúp :

- Thực hiện Báo cáo khả thi phục hồi nhà máy thuỷ điện Đa Nhim.
  Cơ quan chịu trách nhiệm : Bộ Năng lượng.

- Cung cấp viện trợ không hoàn lại cho đề án Xây dựng các trường phổ thông ở các vùng bị bão lụt và miền núi.
  Cơ quan chịu trách nhiệm : Bộ Giáo dục và Đào tạo.

2- Tiếp theo công thư số 911 UB/KTĐN ngày 07 tháng 05 năm 1993 gửi Đại sứ quán, Uỷ ban Kế hoạch Nhà nước xin gửi đến Đại sứ quán Đề cương nghiên cứu (Terms of Reference) của các đề án :

- Quy hoạch tổng thể phát triển lưu vực sông Đồng nai.
  Cơ quan chịu trách nhiệm : Bộ Thuỷ lợi.

- Quy hoạch tổng thể giao thông thủ đô Hà nội.
  Cơ quan chịu trách nhiệm : Uỷ ban Nhân dân Hà nội.

- Quy hoạch tổng thể công nghiệp Hà nội và báo cáo khả thi khu công nghiệp Nam Nội bài-Đông Anh.
  Cơ quan chịu trách nhiệm : Uỷ ban Nhân Dân Hà nội.

- Báo cáo khả thi nâng cấp quốc lộ 18 (đoạn Bắc Ninh-Chí Linh và Bãi Cháy-Tiên Yên).

và một lần nữa nhắc lại đề nghị Chính phủ Nhật bản giúp thực hiện các dự án này.

2- Đối với các đề án :

- Lập báo cáo khả thi thuỷ điện Bản Mai (tỉnh Nghệ An),
- Đánh giá lại báo cáo khả thi thuỷ điện Đại Ninh,
- Lập báo cáo khả thi mạng cáp ngầm điện thoại tại Hà nội và thành phố Hồ Chí Minh,

cũng được nêu trong công thư nói trên, hiện phía Việt nam đang xem xét lại các dự án này, do vậy Uỷ ban Kế hoạch Nhà nước chưa gửi Đề cương nghiên cứu để thực hiện trong năm tài chính 1993.

Nhân dịp này Uỷ ban Kế hoạch Nhà nước nước C.H.X.H.C.N.Việt nam xin được một lần nữa tỏ lòng cảm ơn đến Đại sứ quán Nhật bản về sự cộng tác chặt chẽ và có hiệu quả mà Đại sứ quán đã và đang dành cho Uỷ ban.

K.T Chủ nhiệm
UỶ BAN KẾ HOẠCH NHÀ NƯỚC
Phó Chủ nhiệm

Võ Hồng Phúc

Nơi nhận
- Như trên
- Lưu VP,KTĐN

(Unofficial translation)

STATE PLANNING COMMITTEE SOCIALIST REPUBLIC OF VIET NAM
No. 1978 UB/KTDN
Ref.Projects for Development Study

Hanoi, September 29, 1993

To : Embassy of Japan

The State Planning Committee of the SR of Vietnam presents its compliments to the Embassy of Japan and has the honour to inform the latter of the followings:

1- SPC requests the Japanese Government 's help for the following projects:

* Implementation of the F/S for the rehabilitation of Da Nhim Hydropower Station.
- Responsible organization : Ministry of Energy.

* Grant aid provision for the project on building schools in flooded and mountainous regions.
- Responsible organization : Ministry of Education and Training

2- In reference to the Note No.911 UB/KTDN dated 07 May, 1993 from SPC to the Embassy, SPC encloses herewith the Terms of Reference of the following projects:
* Master Plan for the development of the basin of Dong Nai river.
- Responsible organization : Ministry of Water Resources

* Master Plan for the transport system in Hanoi
- Responsible organization : Hanoi People's Committee

* Master Plan for Hanoi Industry and Feasibility Study for Industrial Zone in South Noi Bai-Dong Anh.
- Responsible organization : Hanoi People's Committee

* Feasibility Study for the Upgrading of National Route No.18 (Bac Ninh-Chi Linh and Bai Chay-Tien Yen).
- Responsible organization :

and once again SPC repeats the request to the Japanese Government for the above-mentioned projects.

3- Regarding the following projects :
- Feasibility Study for Ban Mai Hydropower station (Nghe An Province)
- Reevaluation of Feasibility Study for Dai Ninh Hydropower Station,
- Feasibility Study for the underground telephone cable network in Hanoi and Ho Chi Minh City,

which were also mentioned in the above Note, the Vietnamese side is now reconsidering those projects, and therefore SPC does not send their Terms of Reference for the implementation in fiscal year 1993 yet.

The State Planning Committee of the SR of Vietnam avails itself of this opportunity to renew to the Embassy of Japan the assurance of its highest consideration.

For the Chairman of SPC
Vice Chairman
Vo Hong Phuc (signed)

TECHNICAL COOPERATION
BY THE GOVERNMENT OF JAPAN

APPLICATION

By the Government of the Socialist Republic of Viet Nam for a study on Rehabilitation of Da Nhim Power System to the Government of Japan.

1. PROJECT DIGEST

(1) Project Title : Feasibility Study onRehabilitation of Da Nhim Power System

(2) Background

The Da Nhim hydropower project was constructed with installation of 160MW(4 units of 40MW) as well as dam, gates and penstocks, Saigon substation, 230kV transmission line between the power station and substation under the Japanese War Reparation Fund and the loan fund from the Japanese Export and Import Bank, and started its operation in 1964 with average annual production of 1,000GWh.

The Da Nhim power system is now managed by Power Company No.2 of Viet Nam (PC-2). The PC-2 supplies power to the Ho Chi Minh city (major town in the southern part of the country) and 15 provinces located southern part of Thuanhai province, sharing land equivalent to 25% of the whole country and having 24 millions population (equivalent to 35% of country's population 88,960,000).

The PC-2 operates generating facilities of total 999MW consisting of 564MW of hydro and 435MW of thermal and others, and produces annual energy of 3,831.5GWh (2,577.8GWh by hydro and 1,253.7GWh by thermal and others in 1991). Actual operation records of the PC-2 in the period of 1986-1990 show an annual average growth rate of maximum demand to be 20.6% and that of energy demand to be 15.4%. An examination forecasts for the region that the maximum demand and energy requirement in the year 2000 will reach a range of 1,740MW to 1,960MW and 8,900GWh to 10,100GWh, respectively.

The Da Nhim power station is an important energy source in the PC-2 region to cover 16% of the regional total output and more than 20% of the total annual energy production in the region. During 29 years since its commissioning, the power station has played an important role in the country regardless of such serious damages as

cracks occurred on turbine runners over 6 times, vibration of turbine housings, damages on two generator shafts, damages to the penstocks over twice, etc. Recently, however, various issues to impede the stable energy production due to deterioration of facilities are observed, for example: erosion on main valves for a turbine, functional declination of turbine control devices, occurrence of cracks on main exciter rotor, abnormal temperature rise of bearing, oil leakage from main bushings and potential devices, shortage of spare parts, etc.

Under the situation, it is urgently required to conduct detailed inspection on the facilities and to formulate comprehensive rehabilitation programs for ensuring a long life operation of the Da Nhim power system.

(3) Request to Study

Although the power facilities in the Da Nhim project has been operated over 29 years after its commissioning, it is still effectively active for further decades if adequate rehabilitation to the facilities will be conducted in time.

The Government of Viet Nam would like to request the Government of Japan to conduct the following studies for rehabilitation and upgrade of the Da Nhim power system as soon as possible under the Grant Aid.

(a) Concrete rehabilitation items of such facilities as for dam, waterway, turbines, generators, main transformers, switchgears and control equipment.

(b) Collection of basic data for rehabilitation and renovation of the facilities on a target of further 10 years continuous operation through non-destructive inspection for turbines/generators and insulation level inspection for main electrical equipment.

(c) Formulation of rehabilitation and renovation plans of the facilities.

(d) Formulation of rehabilitation and renovation plans of 230 kV transmission line and Saigon substation.

(e) Formulation of upgrade of the existing 66 kV transmission lines from the power station.

study will also cover rehabilitation of 230kV transmission line and Saigon substation as well as upgrade of the existing 66kV transmission lines from the power station.

(3) Study Area

Following areas are subject to the study:

(a) area covering dam, reservoir, penstocks and power station,
(b) area of the Saigon substation in Ho Chi Minh City,
(c) area covering 230 kV transmission line between the Da Nhim power station and the Saigon substation over 157 KW,
(d) area covering 66 kV substations at Thap Cham, Phan Ri, Phan Thiet, and Cam Ranh.

The above-mentioned study areas are geographically shown on the attached map.

(4) Scope of the Study

The study will be conducted in the following three(3) stages:

(a) Preliminary study stage
(b) Detailed study stage
(c) Detailed design stage

(4.1) Preliminary study stage

(a) Data collection and review

Examination on the collected data for commissioning tests, past operation records, inspection records, fault records, and repairing records.

(b) Operation program

Examination on future operation programs of the power station and substations concerned.

(4) Responsible and Executing Agencies

Responsible and executing agency for the project is the Power Company No.2 of Viet Nam who is wholly responsible for management, operation and maintenance of the power sector in the region including the Da Nhim power system.

2. TERMS OF REFERENCE OF THE STUDY

(1) Necessity of the Study

Most of power generated in the Da Nhim Power Station is still transmitted to Ho Chi Minh city area, but there is a growing demand in the neighboring area, where the energy production of 30 - 40% at the Da Nhim Power Station will be distributed.

In order to meet this rapid growth in electricity demand, the power supply capability for generation, transmission and distribution is to be expanded at a high pace.

Capital investment for increasing the generating capacity has been significant made in recent years, however, the results are not expected visible in the immediate future.

Effort to prevent failure and trouble, and maintenance activities to keep up the existing power system equipment and facilities for stable operation have been done to the maximum extent.

In this respect, all the facilities of the Da Nhim power system should properly be rehabilitated and renovated for continuously reliable power supply to those areas. The study is, accordingly, urgently required to formulate concrete programs for the purpose and to justify the project technically and economically.

(2) Objectives of the Study

In order to continuously operate the Da Nhim power system in the stable condition for a period of further 10 years at least after rehabilitation of the power station, it is essential to thoroughly inspect and evaluate present conditions of the generating and other relevant facilities, and carry out remedial or rehabilitation works, so that similar troubles may not occur again. In this respect, detailed investigation and tracing of cases of troubles on all the facilities in the past is required and systematic inspection and study by experts for their respective fields are necessary. The investigation and

(4.2) Detailed study stage

(a) Generating facilities

(i) Operational conditions of main equipment

Measurement of vibration, shaft displacement, abnormal noise, temperature of major equipment under running condition, and confirmation of their odour and discolouration.

(ii) State conditions of main equipment

After dewatering of waterway and de-energization of main circuit, following inspection will be conducted.

- internal inspection of the machines and confirmation of conditions
- non-destructive examination of main parts of the machines
- insulation examination of major electrical equipment

(b) 230kV transmission facilities including Saigon substation

(i) Inspection under energized condition

Inspection and measurement will be conducted on vibration, shaft displacement (rotary condenser), noise, odour, heat, temperature, etc. of machines.

(ii) Inspection under de-energizing condition

- check and confirmation of damages or deterioration on equipment
- insulation examination of major electrical equipment

(4.3) Detailed design stage

(a) Finding of the cause for the determination of equipment and determination of the countermeasures

(b) Preparation of alternative rehabilitation plans

(c) Formulation of the optimum rehabilitation plan

(d) Detailed design

(i) Detailed design for the rehabilitation of dam facilities, turbines, generators, main transformers, switchgears and control gears

(ii) Selection of necessary spare parts

- replacement of governor and turbine control panel, and improvement of its related equipment
- non-destructive examination of main parts

(c) Generators

- examination on insulation of stator coils
- renovation of excitation system
- detailed inspection of AVR and replacement of the parts
- repair of slipping and brush holders
- renovation of bearings
- renovation of protective devices

(d) Main transformers

- replacement of 1ry, 2ry and neutral bushings
- preventive measures for tap-changer mechanism due to hydrogen sulphide
- replacement of all packings
- examination of instrument transformers

(e) Switchgears

- detailed inspection of circuit breakers
- replacement of packings
- repair of instrument of transformers

(f) Control board

- detailed inspection
- replacement of parts for the meters, protective relays and control devices

(g) Spare parts

Supply of spare parts will be examined in consideration of 10 years operation.

(h) Renovation of signal transmission facilities between power station and gate control room

(i) Improvement of hydrological data acquisition system

(j) Renovation of 230kV transmission line and Saigon substation

(k) Examination on the upgrade plan for the existing 66kV transmission lines

(iii) Detailed design for the rehabilitation of 230kV transmission line and Saigon substation

(iv) Formulation of the upgrade plans of the existing 66kV transmission lines and substations

(e) Cost estimate

(i) cost estimate for the Project with allocation to foreign and local portions

(ii) preparation of disbursement schedule of the Project cost

(f) Implementation program

Detailed implementation program of the project will be prepared.

(g) Economical and financial analysis

The formulated Project will be analysed for economical and financial evaluation in addition to the technical evaluation.

(h) Recommendation of the future renovation program

(4.4) Detailed contents of rehabilitation plans

Following are detailed items to be studied for rehabilitation of each facilities in the Project.

(a) Dam and Waterway

- spillway gates : repair of gate leaf
- intake gates : repair of gate leaf, fixed and movable screens
- hoists : detailed inspection and replacement of hoist rope
- penstock pipes : non-destructive examination, measurement of thickness and inspection of surface painting condition of pipes

(b) Water turbines

- replacement of runner
- repair of needles, needle tips and their operating mechanism
- repair of deflectors and their operating mechanism
- improvement of housings
- repair of jet brake, inlet valve and their operating mechanism
- repair of by-pass valve and its operating mechanism

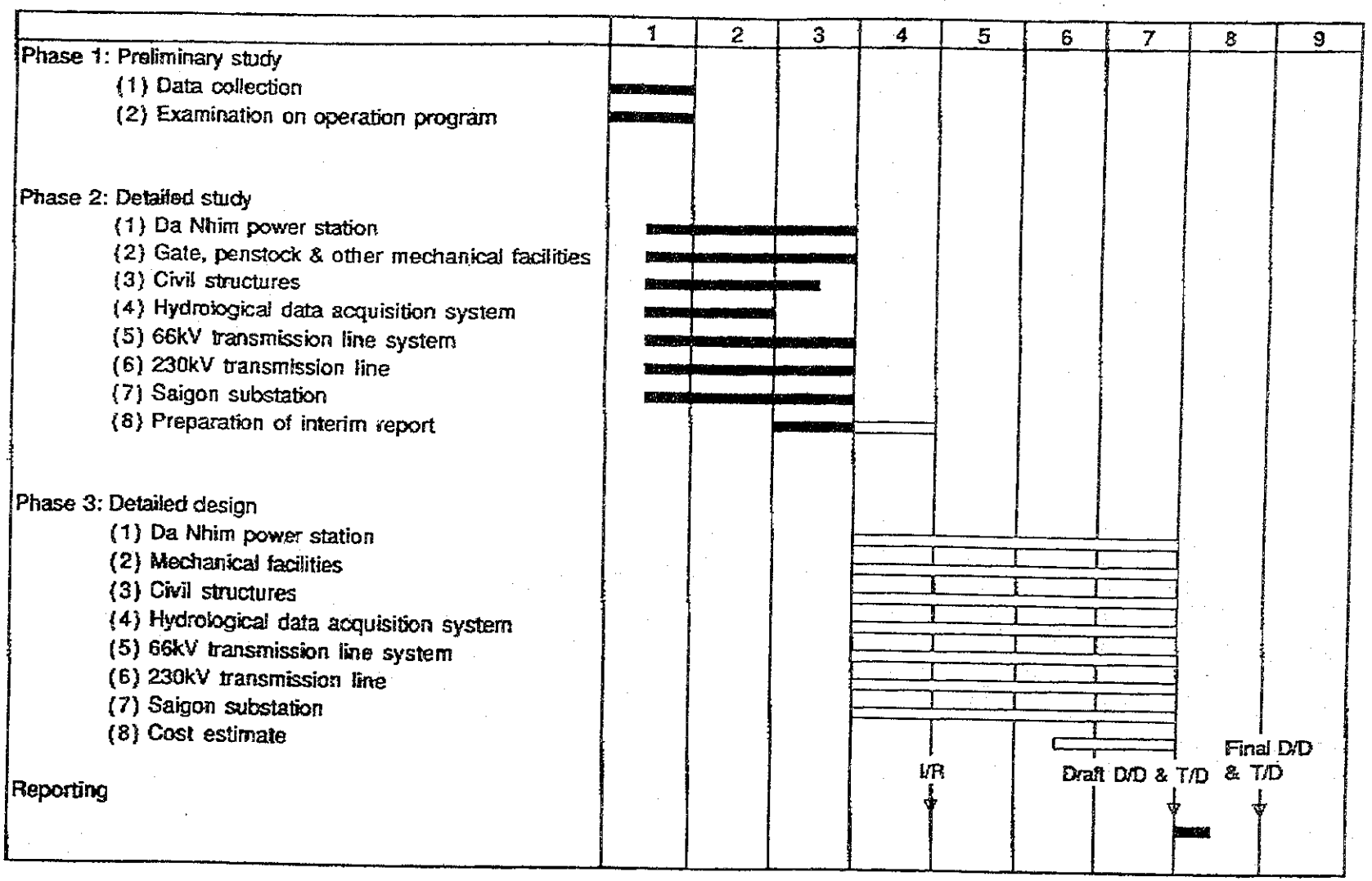
(5) Study Schedule

The expected study schedule is shown on the attached sheet.

The Consultants will prepare an overall rehabilitation program in the study area consistent with the objective and scope of the study putlined above. The study will require the following experts and about 80 man-months of the experts in total.

- Team leader (generating facility expert)
- Deputy team leader (mechanical engineering expert)
- Water turbine expert
- Auxiliary equipment and governor expert
- Generator expert
- AVR and exciter expert
- Control gear experts (for Da Nhim and Saigon)
- Testing expert
- Transformer and switchgear expert
- Rotary condenser expert
- Transmission line experts
- Substation expert
- Hydrological expert
- Telecommunications expert
- Civil engineering expert
- Mechanical engineering expert
- Gate facility experts
- Penstock experts
- Economist
- Cost estimate

Study Schedule for Rehabilitation of Da Nhim Power System



: Works in Viet Nam, : Works in Japan

I/R: Interim Report, D/D: Detailed Design Report, T/D: Tender Documents

(6) Other Relevant Information

Particular instrument for inspection and investigation of the facilities are not available at site. It is advised that the Japanese Study Team may bring into the site the following instrument for their detailed investigation on the facilities.

	Instrument	Q'ty	Specifications
1.	Vibration meter	1	1 micron to 10mm, electric type
2.	Noise meter	1	31.5 to 8,000Hz, 30 to 130dB
3.	Non-destructive insulation meter	1	DC 1,2,3,4,5,6kV, 10,000M-ohm
4.	Tan delta meter	1	1,100V, Tan delta:0-100%, C:1microF
5.	Partial discharge-tester	1	tuning type 400kHz+/-45kHz
6.	Partial discharge-calibrator	1	100kHz, 5/50V, 500 to 25,000pc
7.	Partial discharge-synchroscope	1	10MHz
8.	Camera for synchroscope	1	Polaroid camera
9.	AC high voltage generator	1	30kVA, 1-phase 200V to 0-15/30kV, 50/60Hz
10.	AC volt/ammeter	1	13 range
11.	AC ammeter	2	20/50/100/200mA
12.	AC voltmeter	2	75/150V
13.	Insulation-resistance tester	1	2,000V, 5,000M.ohm
14.	- ditto -	1	1,000V, 2,000M.ohm
15.	- ditto -	1	500V, 1,000M.ohm
16.	Precision square level	1	0.02mm/1m, 250mmsq.
17.	Dial indicator	3	0.01x10mm, dia.55.6mm with a stand
18.	Earth resistance tester	1	
19.	Electronic thermometer	1	
20.	Pressure gauge	1	
21.	Gap gauge	2	
22.	Dial gauge	2	
23.	Supersonic pulse thickness gauge	2	
24.	Hardness gauge	2	
25.	Test hammer	2	
26.	Digital revolution meter	1	
27.	Microscope	1	
28.	Ultra Sonic Testing Equipment	1	

3. UNDERTAKINGS OF THE GOVERNMENT OF THE SOCIALIST REPUBLIC OF VIET NAM

In order to facilitate a smooth and efficient conduct of the Study, the Government of the Socialist Republic of Viet Nam shall take necessary measures:

(1) to secure the safety of the Study team,
(2) to permit the members of the Study team to enter, leave and sojourn in Viet Nam in connection with their resignment therein, and exempt them from alien registration requirement and consular fees,
(3) to exempt the Study team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of Viet Nam for conduct of the Study,
(4) to exempt the 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 Study team for their services in connection with the implementation of the Study,
(5) to provide necessary facilities to the Study team for remittance as well as utilization of the funds introduced in Viet Nam from Japan in connection with the implementation of the Study,
(6) to secure permission for entry into private properties or restricted areas for the conduct of the Study,
(7) to provide the Study team with counterparts and workers necessary for the team's inspection and study,
(8) to provide all necessary data, records and information concerned with the Study,
(9) to provide scaffoldings necessary for the team's field inspection of the facilities,
(10) to secure permission for the Study to take all data, documents and necessary materials related to the Study out of Viet Nam to Japan, and
(11) to provide medical services as needed. Its expenses will be chargeable to members of the Study team.

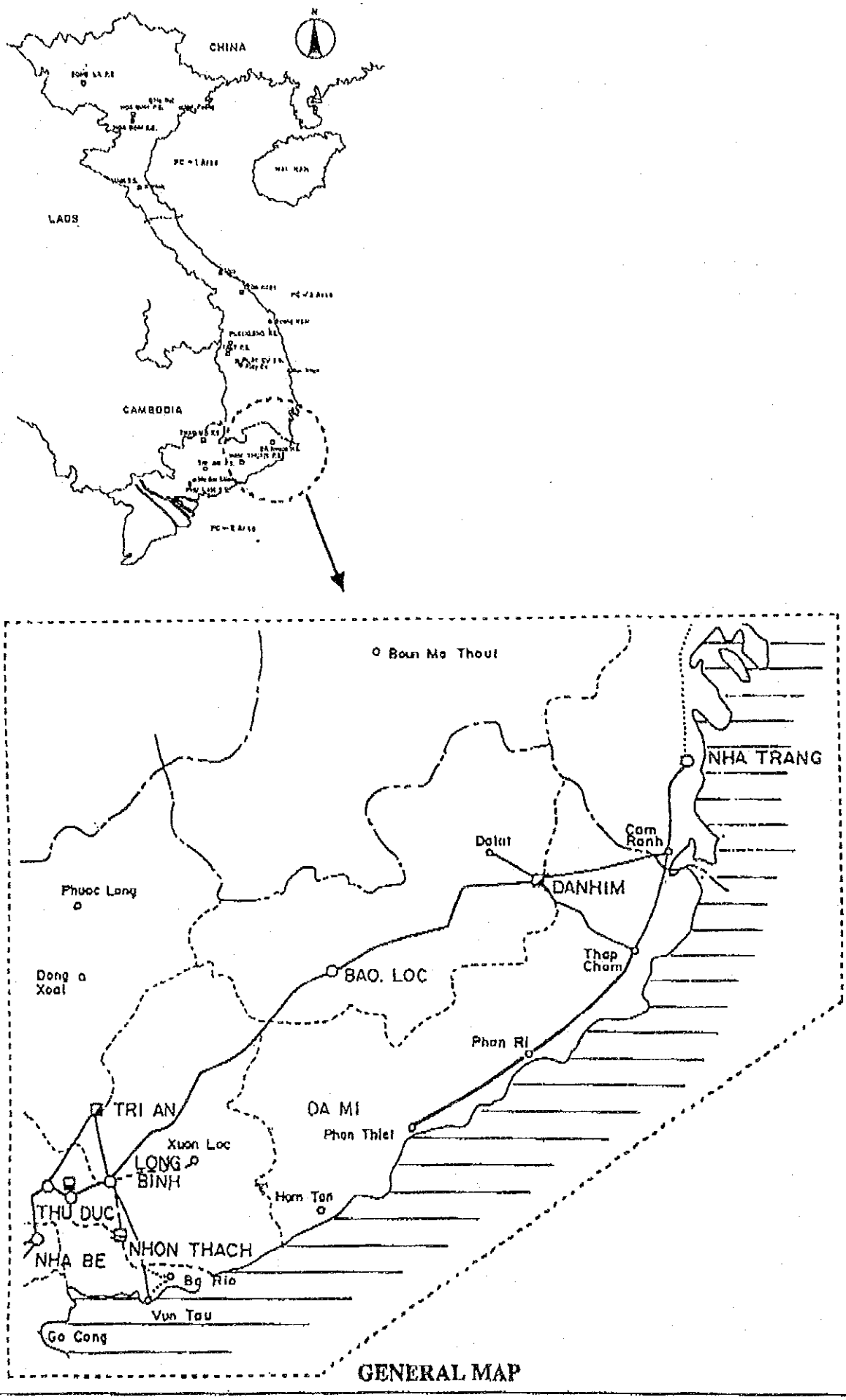
4. The Government of the Socialist Republic of Viet Nam shall bear claims, if any arises against member(s) of the Japanese Study team resulting from, occurring in the course of or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the member of the Study team.

5. The Power Company No.2 of Viet Nam shall act as counterpart agency to the Japanese Study team and also as coordinating body in relation with other governmental and non governmental organization concerned for the smooth implementation of the Study.

The Government of the Socialist Republic of Viet Nam assured that the matters referred in this form will be ensured for a smooth conduct of the Study by the Japanese Study Team.

Signed:
Title:
On behalf of the Government of the Socialist Republic of Viet Nam

Date: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Cam Ranh
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Dong a Xoai
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Thap Cham
Phan Rl
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Xuan Loc
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Ham Tan
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Go Cong

GENERAL MAP

JICA