

THE FEASIBILITY STUDY REPORT
ON
THE INTEGRATED LPG PROJECT (PHASE III)
IN
THE SOCIALIST REPUBLIC
OF THE UNION OF BURMA
(SUMMARY)

OCTOBER 1985

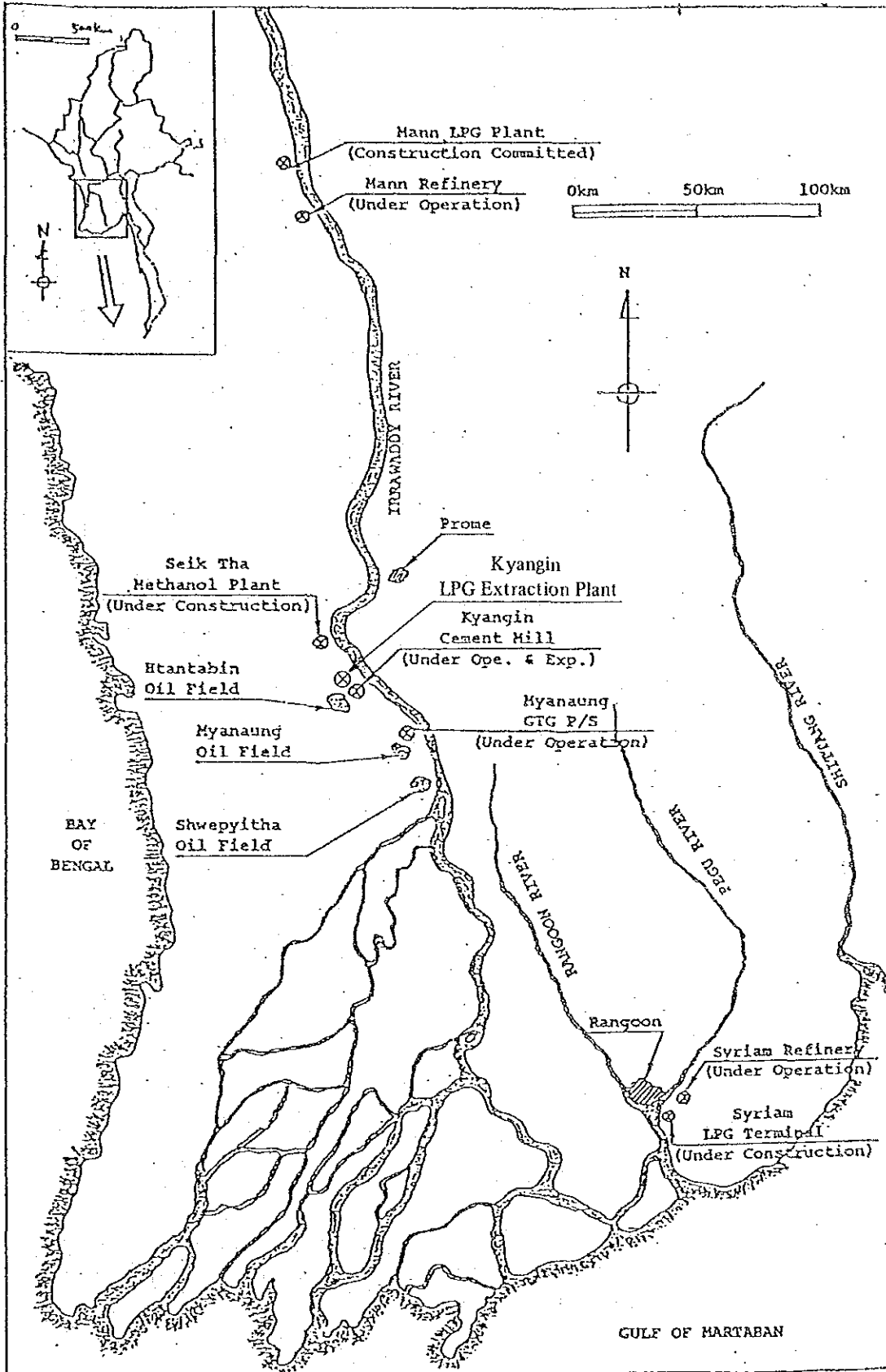
JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

JICA
104
68.5
MPI
LIBRARY

M P I
[REDACTED]
85-186

国際協力事業団	
受入 月日 '86. 5. -7	104
登録No. 12612	68.5
	MPI

Location Map of Integrated LPG Project in Burma



JICA LIBRARY



1034014[9]

1. Background and Survey

In the Socialist Republic of the Union of Burma (hereinafter referred to as Burma), the oil output has increased year by year since the Mann Oil Field along the midstream of the Irrawaddy River was found in 1970. It came up to 11,020,000 B/Y in 1979 and the amount of 1,000,000 B was exported to Japan at the same year. However, since then the oil output had not been increasing substantially. (Refer to Table 1-1)

As for natural gas (or associated gas), the Prome Oil Field, Shwepyitha Oil Field, Myanaung Oil Field and Htantabin Oil Field, along the midstream of the Irrawaddy River were developed one after another beside the Mann Oil Field. The gas is in active utilization. It is used as a fuel in the gas turbine power generation plants, and factories such as cement mills. It is also used as material gas in petrochemical plants like fertilizer plants (in future methanol plants). (Refer to Table 1-1)

Table 1-1 Production of Crude Oil and Natural Gas in Burma

	1980/81	1981/82	1982/83	1983/84 (Provi- sional actual)	1984/85 (Provi- sional)	1985/86 (Target)
Crude oil (10 ³ B/Y)	10,100	10,447	9,789	10,168	11,761	12,504
Natural gas (10 ⁶ SCF/Y)	14,837	14,878	17,400	18,190	24,796	44,902

Source: REPORT TO THE PYITHU HLUTTAW on the Financial, Economic and Social Conditions of the Socialist Republic of the Union of Burma for 1985/86 by MINISTRY OF PLANNING AND FINANCE (1985).

On the other hand, Burmese Government has planned more effective utilization of the natural gas and off gas from Mann Refinery which has been operating since 1982. According to its plan propane (C₃) and butane (C₄) in the off gas and in associated gas of the oil fields previously mentioned will be recovered as LPG and most of it will be exported. In materialization

of the above planning, it has been requested by the Burmese Government to the Japanese Government to perform survey for the feasibility study to be designated as Phase III of the "Integrated LPG Project in Burma". The Project will consist of Phase I-part 1, Phase I-part 2 and Phase II which are under implementation, and this Phase III which is currently on planning stage. Based on the above request, the Japanese Government entrusted the undertaking of the said feasibility study to the Japan International Cooperation Agency.

The outline and the progress of the Integrated LPG Project in Burma is as shown in Table 1-2.

Table 1-2 Progress of "Integrated LPG Project in Burma"

Phase	Outline of plan	LPG output (T/Y)	Shipment for export (T/Y)	Completion	Remarks
	Construction of Mann Refinery (25,000 B/D) (topper, reformer, coker, etc.) and jetty	13,500 (18,000 including domestic use 3,000)	-	1982	
Phase I part 1	Construction of coker (5,200 B/D) at Syriam Refinery	6,900 (8,000)	5,900 (8,000)	Estimate 1985	
Phase I part 2	Construction of terminal for LPG transportation at Mann and Syriam Shipbuilding of four barges	-	30,000 (45,000)	Estimate 1985 A part of them enter service	
Phase II	Construction of LPG extraction plant (24 x 10 ⁶ SCFD) at Mann GOCS.	30,000 (30,000)	-	Estimate 1986	
Phase III	Construction of LPG extraction plant (50 x 10 ⁶ SCFD) and terminal and jetty at Kyangin Shipbuilding of three big barges	61,000 (25,000)	61,000 (25,000)		
Total		111,400 (81,000)	96,900 (78,000)		

Figure in parentheses is the amount of output and shipment at planning of Phase I - part 2 and Phase II (1981).

2. Outline of the Project

The contents of the "Integrated LPG Project" (Phase III) are as follows.

LPG extraction plant, terminal and jetty will be constructed around Kyangin which is located about 200 km up from the mouth of Irrawaddy River. Most of (50 x 10⁶ SCFD) associated gas (rich gas) produced from each oil field of Shwepyitha, Myanaung and Htantabin will be processed, and propane and butane will be recovered as LPG. Then all of the amount (61,000 T/Y) is planned to be exported. By-product gas (lean gas) will be supplied instead of rich gas to the current consumers (cement mill, power station and in future methanol plant).

The project also includes piping construction for sending associated gas to the extraction plant, as well as the construction of power transmission line from the power station.

Product LPG will be sent from Kyangin to Syriam Terminal nearby Rangoon by 600 T capacity river barges (three days for down stream sailing, five days for upstream sailing). After storage for a while in LPG tanks in the Syriam Terminal, it will be charged to pressurized LPG ocean tankers (1,000 T to 1,500 T capacity) and exported to neighboring countries such as Singapore. The total exporting amount of LPG will be 96,900 T/Y including the output of Phase I and Phase II.

3. Purpose and Scope of Survey

The survey is based on the official request by the Burmese Government. The purpose of survey is to examine the feasibility of the "Integrated LPG Project" (Phase III) (herein after referred to as Phase III), as well as to review the current situation of Phase I-part 1, Phase I-part 2 and Phase II.

The scope of survey is based on the following document in April 1985;

"Scope of Work for the Feasibility Study on the Integrated Liquefied Petroleum Gas Project (Phase III) in the Socialist Republic of the Union of Burma agreed upon between the Japan International Cooperation Agency and the Petrochemical Industries Corporation".

The concrete scope of survey are as follows:

- 1) Discussion on possible supply of associated gas (rich gas).

- 2) Demand of LPG.
- 3) Discussion on size and constitution of LPG extraction plant, terminal and jetty.
- 4) Discussion on construction site of LPG extraction plant.
- 5) Discussion on method, size and constitution for transportation of associated-gas (rich gas), by-product gas (lean gas) and product LPG.
- 6) Discussion on transportation of equipment and materials for plant construction.
- 7) Dispatch of supervisors in charge of construction and construction and trial operation.
- 8) Discussion on schedule of construction.
- 9) Discussion on related infrastructures.
- 10) Discussion on power transmission lines.
- 11) Discussion on communication installations.
- 12) Estimation of amount of investments.
- 13) Financial and economic evaluation.
- 14) Recommendation

4. Constitution of Survey Team

The members of the survey team are as follows:

Team Leader	: Mr. Tetsuhiko Tsunoda
Process Engineer	: Mr. Muneteru Yoshizawa
Mechanical Engineer	: Mr. Masatoshi Harada
Civil Engineer	: Mr. Akira Nagumo
Marketing Engineer	: Mr. Shinji Izume
Electric Engineer	: Mr. Saburo Mizuno
Economist	: Mr. Masaaki Awamoto
Coordinator	: Mr. Yuusuke Kitamura

5. Field Survey

During the term of field survey, the survey team made an effort to obtain necessary data. The team also collected much data by inspections of the Plant site, the terminal and the jetties for the project. The details of the survey team's schedule in field are as follows:

- 1st: Apr. 26 (Fri.) : Leave Tokyo at 17:20 p.m. by TG741
: Arrive at Bangkok at 21:30 p.m.
- 2nd: Apr. 27 (Sat.) : Leave Bangkok at 14:50 p.m. by TG305
: Arrive at Rangoon at 15:30 p.m.
- 3rd: Apr. 28 (Sun.) : Discussion within the Team
- 4th: Apr. 29 (Mon.) : (PM) Meeting at PIC
- 5th: Apr. 30 (Tue.) : (AM) Visit the Japanese Embassy and Japan International
Cooperation Agency
: (PM) Discussion at PIC
- 6th: May 1 (Wed.) : Discussion within the Team
- 7th: May 2 (Thu.) : (AM) Discussion at MOC
: (PM) Joint Discussion with TSC/PIC
- 8th: May 3 (Fri.) : (AM) Discussion at PIC
: (PM) Joint Discussion with PIC/EPC
- 9th: May 4 (Sat.) : (AM) Visit Syriam Refinery, Syrima LPG Terminal and
Jetties
- 10th: May 5 (Sun.) : Go to Seiktha from Rangoon
- 11th: May 6 (Mon.) : Survey Kyangin the North Site and the South Site
: Survey Kyangin LPG Jetty site
- 12th: May 7 (Tue.) : Survey Myanaung Power Station
: Survey Myanaung Gas Field
: Survey Myanaung Gas Control Station
: Survey Transmission-line route from Myanaung Power
Station to Plant site
- 13th: May 8 (Wed.) : Survey Kyangin Cement Mill
: Survey Kyangin Cement Jetty

- : Survey Seiktha Methanol Plant
- : Survey Seiktha Methanol Jetty
- 14th: May 9 (Thu.) : Survey Shwepyitha Oil Field
- : Survey Htantabin Oil Field
- : Survey Methanol Temporary Jetty
- 15th: May 10 (Fri.) : Return to Rangoon from Seiktha
- 16th: May 11 (Sat.) : (AM) Discussion within the Team
- : (PM) Discussion of questionnaire content at PIC
- 17th: May 12 (Sun.) : Discussion within the Team
- 18th: May 13 (Mon.) : (AM) Joint Discussion with PIC/TSC/EPC
- : (PM) Joint Discussion with PIC/TSC/EPC
- 19th: May 14 (Tue.) : Joint Discussion with PIC/TSC/EPC
- 20th: May 15 (Wed.) : (AM) SUBMIT THE PROGRESS REPORTS to the
Burmese Side
- : (PM) RECEIVE BURMESE REPLY for the questionnaire
prepared by the Team
- : Joint final Discussion with PIC/TSC/EPC
- 21st: May 16 (Thu.) : (AM) Visit the Japanese Embassy and Japan International
Cooperation Agency
- : Leave Rangoon at 16:30 p.m. by TG306
- : Arrive at Bangkok at 18:10 p.m.
- 22nd: May 17 (Fri.) : Leave Bangkok at 10:30 a.m. by TG740
- : Arrive at Tokyo at 18:25 p.m.

(Notes) Mr. Izume left Japan on April 28. After market research of LPG in Singapore, he joined the team on May 2.

Mr. Mizuno left Japan on May 1 and joined the team on May 2.

Mr. Kitamura came back to Japan from Rangoon on May 4.

6. Main Facilities

- Kyangin LPG Extraction Plant (located about 10 kilometers away from Irrawaddy riverside)

This is the main equipment of the project, which will treat the raw gas (50×10^6 SCFD) sent from Shwepyitha Myanaung, Htantabin, through the refrigerated absorption process in which Naphtha is used as a solvent, and recover about 90 percent of propane (C_3) and butane (C_4) which are contained in the gas at the rate of approximately 8%, and produce 61,000 T/Y of LPG.

Area: approx. 75,000 m² (250 m x 300 m)

Personnel required (for extraction plant, terminal and jetty): 475 in total

Main equipment:

- a) Raw gas and by-product gas compression system
- b) Raw gas preliminary treatment process system
- c) Cooling system
- d) Propane and butane absorption system
- e) Propane and butane distillation system
- f) Utility facilities
- g) Propane spherical tanks (for one day)
- h) Butane spherical tanks (for one day)

- Kyangin LPG Terminal

The terminal will be located near the Kyangin LPG shipping jetty and equipped with the spherical tanks for safe keeping the LPG product sent from the spherical tanks in the extraction plant. The terminal is designed to ensure stable supply of LPG to river barges which come to load LPG at intervals of 2 – 5 days.

Area: approx. 20,000 m² (100 m x 200 m)

Main equipment:

- a) Propane spherical tanks (for 15 days)
- b) Butane spherical tanks (for 15 days)

o Kyangin LPG Jetty

The jetty will be situated on the riverbank near the above-mentioned terminal and the river is needed to be deep and wide enough for a 600-T capacity barge to have free access to the jetty even during the dry season.

Main equipment:

- a) Main body of jetty
- b) Pontoon
- c) Loading arms for shipment of LPG

o Pipelines for Raw Gas, Lean Gas, LPG, etc.

Associated gas must be carried to the extraction plant as raw material by means of pipelines. For that purpose the pipes of 8 – 14 inch diameter must be laid from both Shwepyitha oil fields (by way of Myanaung) and Htantabin oil fields. Lean gas must be supplied to the consumers like methanol factories by means of pipelines.

In addition, LPG pipeline, naphtha pipeline and water pipeline must be laid on among the extraction plant, the terminal and the jetty.

Main equipment:

- a) Raw gas pipeline
 - Shwepyitha – Kyangin approx. 45 km
 - Htantabin – Kyangin approx. 3 km
- b) Lean gas pipeline
 - Kyangin – Lean gas consumer network junction approx. 5 km
- c) LPG pipeline
 - Extraction plant – Terminal – Jetty approx. 15 km
- d) Water pipeline
 - Extraction plant – Terminal – Jetty approx. 15 km
- e) Naphtha pipeline
 - Extraction plant – Terminal – Jetty approx. 15 km

o Power Transmission Lines

The capacity of Myanaung power station is 67,650 kW and the present demand for electricity is 32,400 kW which is far below the capacity. Although there exist power trans-

mission line leading to the Kyangin cement mill, the transmission line has no extra capacity and a new transmission line needs to be constructed for the project.

Main equipment:

Transmission line for Myanaung power station – Kyangin (66 kV):
approx. 14 km

o **Communication Installation**

The LPG extraction plant must constantly receive raw gas from the respective oil fields 3 – 45 km away and at the same time supply the lean gas for the consumers far way. Mutual communication relating to the transportation of LPG from the extraction plant to the terminal, and power transmission from the power station to the plant are very important for a steady and continuous operation of this plant.

However, in this district public communication network is not available, it is necessary to install an exclusive line as communication facilities for the project.

Main equipment:

Telecommunication facilities

o **Auxiliary Facilities**

As Kyangin and its vicinity are scarcely populated areas on the west bank of the Irrawaddy River, the workers for the plant are difficult to recruit.

Therefore, it is needed to build living quarters for the employee. As infrastructure is incomplete in this area, some facilities, such as electricity and water supply, are necessary to be prepared before the completion of plant construction.

o **LPG River-Barges**

Barges with a shallow draught should be used for transportation of LPG products to Syriam Terminal nearby Rangoon.

The pusher boats for the river barges built in Phase I-part 2 are insufficient in number, thus being unavailable in the Phase III. Self-propelled river barges should be provided for the Phase III.

Main equipment:

Self-propelled LPG river-barge (a 600T capacity barge) x 3

- o Construction Machinery, etc.

Although the construction machineries purchased under the previous project should be used as much as possible, the most of them are worn considerably requiring a large amount of repair costs.

What is characteristic of this area is to carry all the construction materials across the Irrawaddy River and it takes a few more days to make a detour up the stream using a ferry.

In order to carry out the construction smoothly, it is necessary for a Z-craft to wait for by the riverbank near the construction site and carry construction materials by the river transportation whenever necessary.

Main equipment:

- a) One lot of construction machinery
- b) One lot of spare part for existing machinery
- c) One unit of Z-craft

- o Syriam Terminal (nearby Rangoon)

According to the project up to Phase II, the export quantity was 53,000 T/Y, but is revised to 96,900 T/Y by Phase III.

As a matter of course, it is necessary to expand receiving tanks and expand or increase the jetty at the terminal. However, as for the jetty, the number of navigation of barges is decreased by increasing the capacity of the LPG barges to 600 T and the expansion or increase of the jetty will be avoided by adopting night shift of stevedoring.

Main equipment:

- a) Propane spherical tanks (for 20 days as a target)
- b) Butane spherical tanks (for 20 days as a target)

7. Construction Schedule

Commencement of construction work : July, 1987
Completion of construction work : June, 1989

The schedule may be accelerated if procurement work can be done in shorter time.

8. Export Market for LPG

Under the project, the total quantity of LPG is to be appropriated for export and accordingly attention should always be paid to the trends of demand and prices at the destinations.

In the world market of LPG, the quantity of Middle East produced LPG is overwhelmingly large. Hence their prices are becoming leading ones in the world, and the prices of LPG in the Asian or European markets are determined by CIF prices of the LPG from the Middle East.

The LPG is carried from the Middle East or Indonesia into the Japanese market in a large quantity by using the large-capacity refrigerated type tankers for the exclusive use of LPG (30,000 – 50,000 T capacity) at a very cheap freight rate.

However, under the project, the export quantity is 96,900 T/Y which is rather small as there is no utilizing the above-mentioned refrigerated type tankers, therefore it is applied to small capacity pressurized tankers (1,000 – 1,500 T capacity) in order to carry out LPG. As a result, a tanker rate becomes rather costly, which means that the transportation for a long distance will be disadvantage and available market would be Singapore or at most Hongkong.

Particularly, Singapore, since the commencement of operation of Petrochemical Corporation of Singapore, has come up on the stage as a consumer of LPG which is their raw material and increased importance as the export destination of Burma.

When the FOB Rangoon price of LPG is estimated from the LPG price of US\$210 – 220 per ton at Singapore, it will be US\$130 – 150 per ton.

Under the project, the FOB Rangoon price is assumed to be US\$140 per ton.

9. The Fund Required (Total Capital Requirement)

	Foreign Currency (¥1,000)	Local Currency (K1,000)
Kyangin LPG plant	6,516,000	26,600
Kyangin terminal, jetty	1,492,000	4,500
Syriam terminal expansion	747,000	900
LPG barge (3 barges)	1,890,000	
Construction machinery and tools	600,000	21,000 *
Transportation	755,000	6,500 **
Sub-total	12,000,000	59,500
Physical contingency	300,000	3,500
Price contingency	200,000	0
Construction cost Sub-total	12,500,000	63,000
Commissioning fee	100,000	-
Sub-total	12,600,000	63,000
Pre-operation cost	-	3,246
Initial working capital	-	250
Interest during construction	260,870	-
Total	12,860,870	66,490
Grand total		US\$60,073,000

* Rental fee

** Including insurance expense

10. Financial & Economic Analysis

10.1 Premises

- o Project life 20 years
- o Foreign exchange rates US\$1 = 8.6 Kyat ¥100 = 3.5 Kyat
- o Conditions for long-term loan

	Annual interest rate	Term of repayment
a) Base Case	2.75%	30 years (including the grace period of 10 years)
b) Case A	5.0 %	10 years
c) Case B	7.8 %	10 years

- o Depreciation

“Straight-line method” is adopted for depreciation. The term of depreciation is 20 years for equipment and machinery, and the estimated salvage value is 12%. The term of depreciation is 50 years for civil and buildings and the estimated salvage value is 10%. As for pre-operation costs, commissioning fee and interest incurred during construction, the term of depreciation is 5 years with no salvage value.

- o Contribution to state (CTS)

The rate of contribution is 30% on net income, however, in case it is over Kyat 50 million, the rate will be 40%.

- o Import duty

It is 15% on a CIF Rangoon price of the equipment & machinery and accrued payments will be made in annual equal installments for 5 years starting from the second year of operation.

10.2 Financial Analysis

		IRROI (%)	IRROE (%)
1)	Base Case		
	Before tax/CTS	7.90	45.69
	After tax/CTS (import duty, CTS)	5.11	34.32
	Payback period	13.1 (years)	2.6 (years)
2)	Import duty exempted		
	After tax (CTS)	5.78	40.09
	Payback period	12.1 (years)	2.2 (years)
3)	CTS exempted		
	After tax (import duty)	6.93	37.81
	Payback period	11.1 (years)	2.4 (years)
4)	Change of financing conditions	Case A	Case B
		IRROE (%)	IRROE (%)
	Before tax/CTS	14.84	11.96
	After tax/CTS (import duty, CTS)	8.08	4.22
	Payback period	17.1 (years)	-

(a) The IRROI after tax/CTS of the Project is 5.11%. This indicates that the profitability of the Project itself may not be so high, but not so desperately low. However, the IRROE after tax/CTS is 34.32%, if capital procurement under the soft financing conditions of long term loan presumed in this report is affirmative.

(b) The position of funds and financial situation of the Project are sound and hence the Project is financially viable.

10.3 Economic Analysis

The EIRR is 7.20% which is better than 5.11% of the IRROI after tax/CTS but is slightly lower than 7.90% of the IRROI before tax/CTS in the financial analysis. The implemen-

tation of the Project will contribute immensely to the Burmese Economy, by earning foreign exchange amounting to US\$90,532,000 as direct economic benefits over the entire project life. Furthermore, a number of indirect economic benefits are also conceived. As results of the above benefits, the project will make a high overall economic effect, and therefore the implementation of the Project is suggested itself to proceed positively.

11. Evaluation and Conclusion

As a result of the financial and economic analyses, the followings are set forth:

- 1) IRROI after tax/CTS of the Base Case is 5.11%, which proves the Project to be feasible. In IRROI before tax/CTS of the Base Case, the CTS and the import duty is assumed to be exempted and IRROI is 7.90%. This may be available if the Project is considered as the national project with the highest priority.
- 2) The import duty exempted case in the Base Case is the case where the import duty on the imported equipment and machinery is exempted, though the CTS is not exempted. The IRROI is then improved favorably to 5.78%.
- 3) In the CTS exempted case in the Base Case, the import duty on the imported equipment and machinery will be paid irrespective of exemption of the CTS.

The basic industries like Phase III Project can contribute much for the development of the regional society, at the same time having spread effects on the other industries, so such project may enjoy special treatment like CTS exemption. Then, the IRROI will rise favorably to 6.93%.

- 4) For both of Case A and Case B, long term loans on higher interest rates (5.0% p.a., 7.8% p.a.) are introduced respectively, together with a shorter repayment period (10 years). Both cases make the shortage of money from the first year of operation, so that short-term loans have to be borrowed. As a result, compared with the Base Case, the IRROE of both cases are very low. In Case A, it will take 17 years to recover the investment, and in Case B it is not possible to recover it. Since both cases show that the operation and management of the Project are very difficult in fact, the project plans under such strict conditions are infeasible.
- 5) In the Base Case, the EIRR for the Project is 7.20% which exceeds the financial IRROI after tax/CTS of 5.11%. With the implementation of the Project, a direct benefit like foreign exchange earnings and many indirect benefits will be incurred,

indicating high economic impact on the country.

12. Recommendation

The attention should be directed to the following in execution of the Integrated LPG Project (Phase III).

12.1 Improvement of the Plant Operations Rate

The treatment volume of rich gas in the Kyangin LPG extraction plant is dependent on the gas consumption of the Myanaung power station, Kyangin cement mill and in the future, Seik Tha methanol plant which are now supplied with rich gas from Shwepyitha, Myanaung and Htantabin oil fields.

Therefore, to improve this plant's operations, close contacts with the consuming factories and the power station must be made. Furthermore, coordination should be made to carry out the plant's maintenance during the times when the consumers do not operate – such efforts must be made throughout the year to improve the plant operations.

12.2 Preparation for Construction

Soon after the execution of the project is decided, an organization should be formed with reference to the experience in the previous project, and its members must start action and make preparations such as listing of construction machinery used for the previous project, their repair, the procurement of construction materials to be purchased in Burma, etc.

12.3 Execution of Preliminary Work

The roads, bridges, etc. in the vicinity of the site for the plant are defective and incomplete and their improvement is of course needed, but as the land preparation of the plant site and especially, the terminal site is accompanied with the transport of a large quantity of soil which takes a long time and this can be a bottleneck in the whole construction schedule. Therefore, the preparation work must be started beforehand immediately after the execution of the project is decided.

12.4 Planning and Execution of the Expansion Program of Domestic Market

If LPG proves to be an economical energy source for enterprises, corporations and

the public from the point of handling as well as economy, it will not be difficult to increase the domestic consumption.

As it is clearly of benefit to the nation to substitute LPG for the other petroleum products, electricity, etc., it is advisable to lessen price discrepancies between LPG and gasoline, kerosene, electricity for domestic use, and, for example, give a subsidy for promotion of domestic consumption as one of the concrete policies.

In any case, for the expansion of domestic market for LPG, the problems close at hand are necessary to be solved.

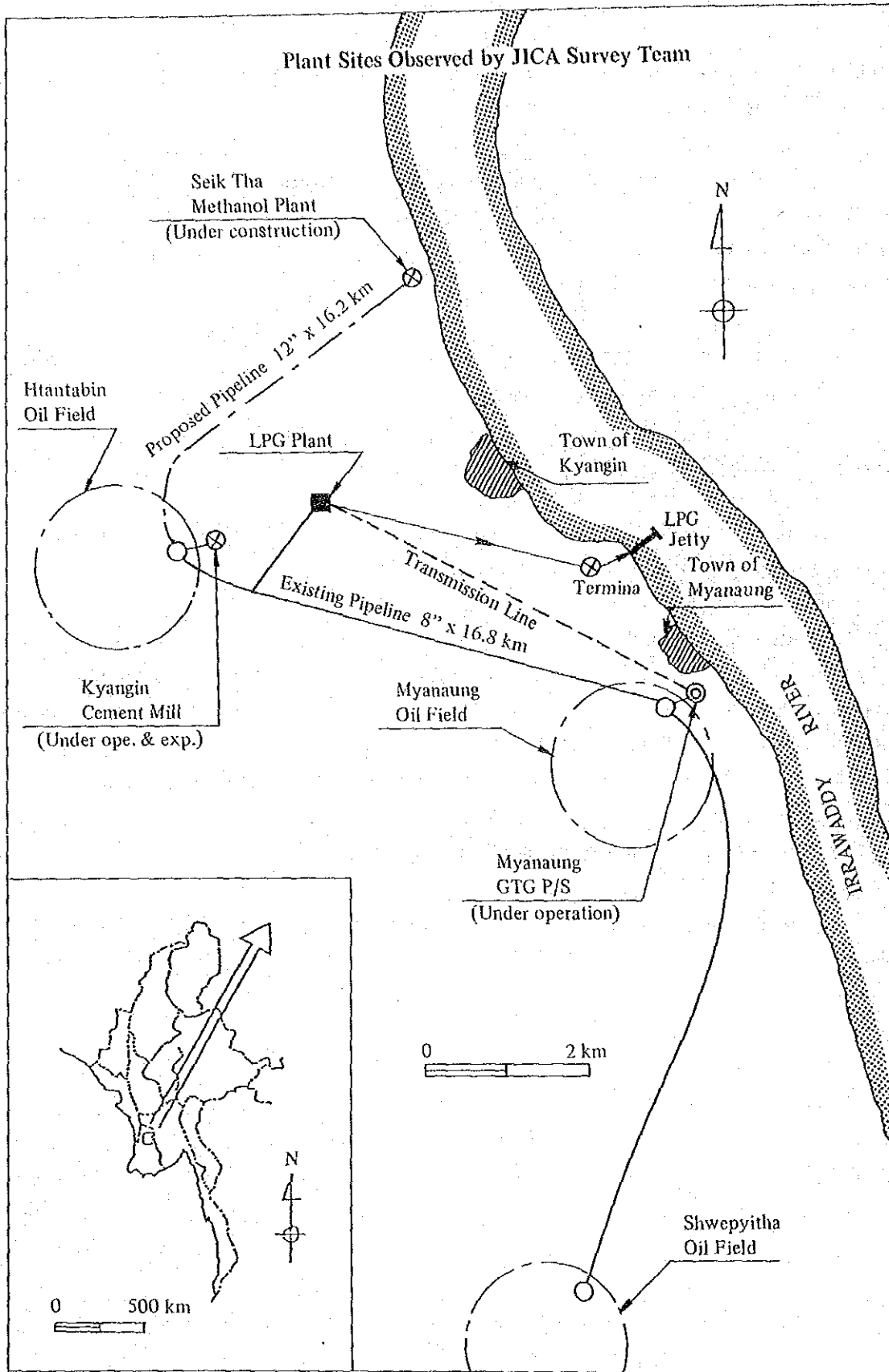
12.5 Cultivation of Export Market

Since under the project, the whole LPG product is to be directed toward the export due attention should be paid to the export market.

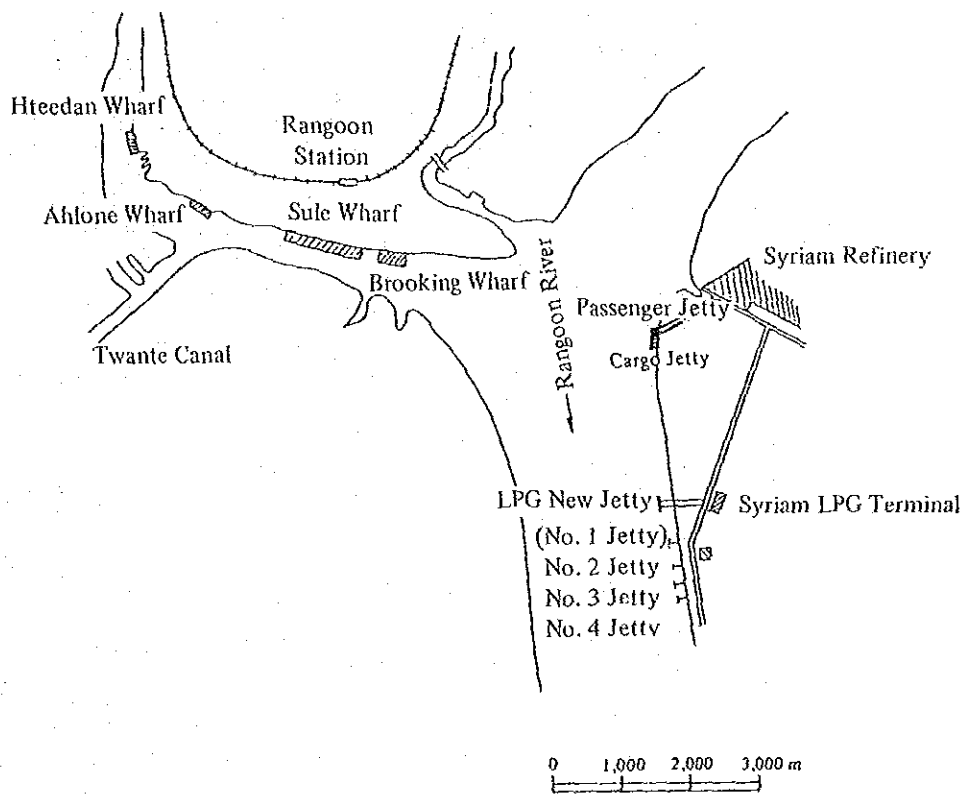
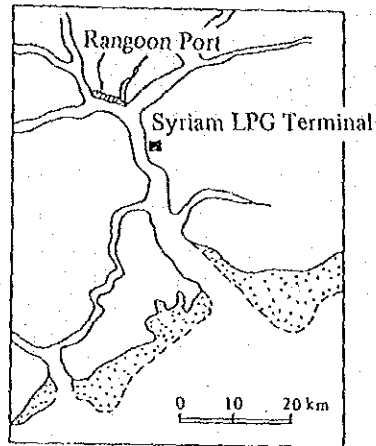
In the world petroleum market in which LNG takes part as well, a price system among crude oil, LPG and LNG seems to be steady now, but yet there can sometimes be a case where LPG alone starts a different movement from the others. Foreseeing the above circumstances, Burmese Government should strengthen its investigating faculty of the world market, for LPG so that it can export the LPG product on the most favorable conditions possible.

12.6 Application of the Experiences from the Preceding Projects

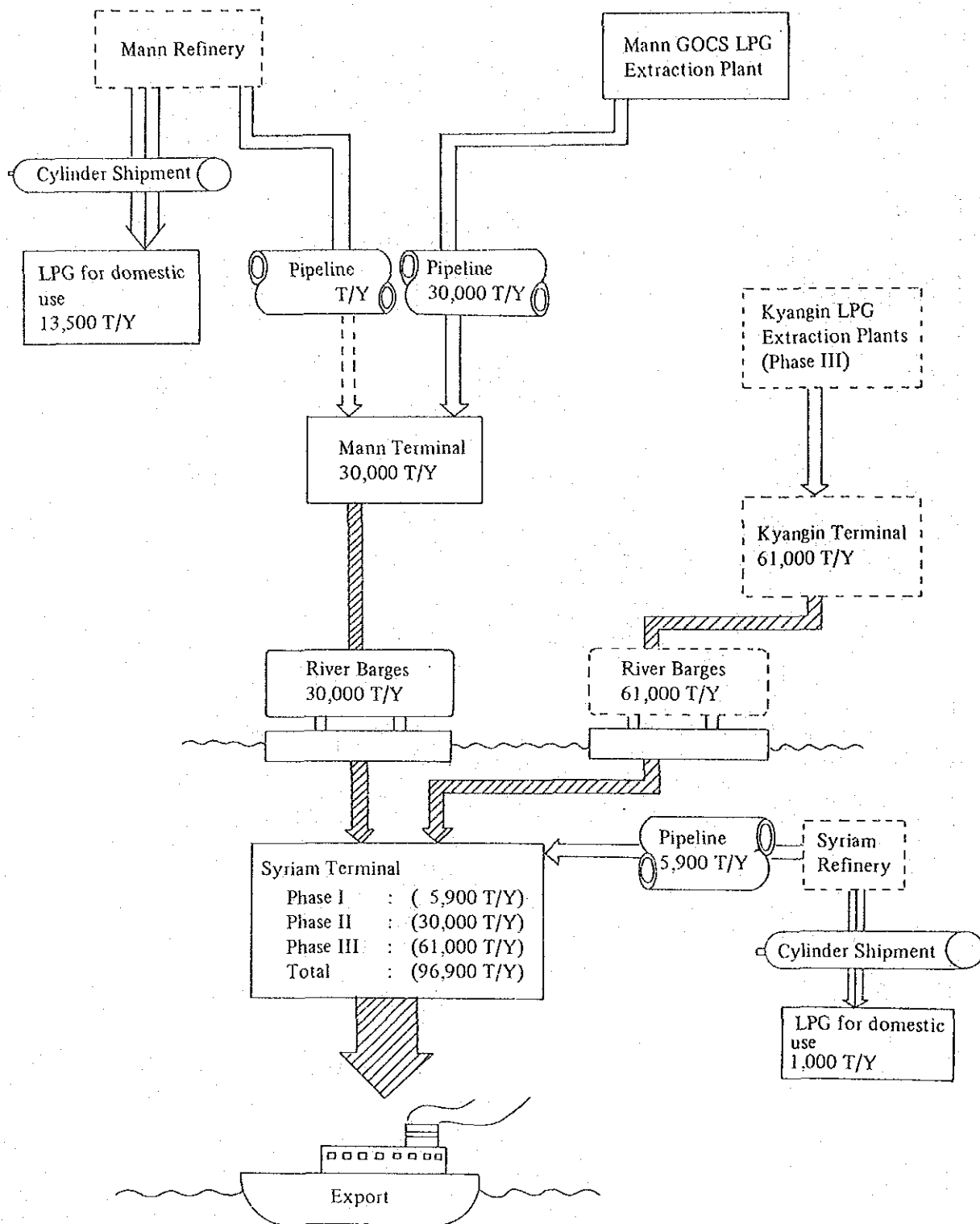
In order to expect the favorable performance of the project, best effort should be made to make a good use of experience in the previous projects (Mann Oil Refinery, Phase I, Phase II).



Rangoon Port



LPG Transportation System



JICA