

I. 協力実施プロセス

<p>1. 要請の内容と背景</p>	<p>インドネシア共和国政府は経済自立促進、経済基盤強化及び産業発展と民生の向上の両立を目指し、1984年から始まった第4次経済社会開発5ヶ年計画の中で、石油・天然ガスについては戦略的重要性からその効率的な探鉱開発を資源政策上の重要な課題として力を注いでいる。</p> <p>その一環として「イ」政府としては、その広大な未開発地域における石油・天然ガス埋蔵有望地域的調査手法として本リモートセンシング技術に着目し、同国への本技術の導入に資するために、鉱山エネルギー省の傘下の石油天然ガス研究所に「石油・ガスイメージプロセッシング研究所」を設立することを計画し、我が国にプロジェクト方式技術協力を要請してきた。</p>
<p>2. 協力実施プロセス</p> <p>(1) 要請発出</p> <p>(2) プロジェクト形成調査 (担当/氏名/所属)</p> <p>(3) 事前調査 (担当/氏名/所属)</p> <p>(4) 長期調査員 (担当/氏名/所属)</p> <p>(5) 実施協議 (担当/氏名/所属)</p>	<p>1988年7月31日</p> <p>1988年5月22日 ~ 1988年6月1日 (11日間)</p> <p>団長・総括 木村 和夫 農林水産省 近畿農政局 建設部次長</p> <p>企画協力 石川 守 農林水産省 経済局国際協力課 海外技術協力官</p> <p>農業開発 太田 信介 農林水産省 構造改善局整備課 課長補佐</p> <p>資源開発 野口 泰彦 通商産業省 資源エネルギー庁石油部海外開発課</p> <p>資源探査 塚田 紘也 財団法人 資源観測解析センター調査開発部課長</p> <p>リモートセンシング 道野 俊雄 財団法人 リモートセンシング技術センター 調査部主任</p> <p>業務調整 永井 和夫 国際協力事業団農業開発協力部農業技術協力課</p> <p>1988年11月28日 ~ 1988年12月7日 (10日間)</p> <p>団長・総括 角野 祥三 国際協力事業団 鉱工業開発協力部 部長</p> <p>資源政策 野口 泰彦 通商産業省 資源エネルギー庁石油部海外開発課</p> <p>コンピュータリサーチ 塚田 紘也 財団法人 資源観測解析センター調査開発部課長</p> <p>石油・地質 岩下 篤 財団法人 資源観測解析センター調査課長</p> <p>業務調整 山口 公章 国際協力事業団 鉱工業開発協力部 鉱工業開発技術課</p> <p>1989年5月24日 ~ 1989年5月31日 (8日間)</p> <p>技術協力計画 高橋 悟 国際協力事業団 鉱工業開発協力部 鉱工業開発技術課</p> <p>資源政策 野口 泰彦 通商産業省 資源エネルギー庁石油部海外開発課</p> <p>コンピュータリサーチ 塚田 紘也 財団法人 資源観測解析センター調査開発部課長</p> <p>1989年8月14日 ~ 1989年8月22日 (9日間)</p> <p>R/D又は協定の署名・交換 1989年8月21日</p> <p>団長・総括 山崎 宗重 国際協力事業団 鉱工業開発協力部 部長</p> <p>技術協力計画 岩野 宏 通商産業省 資源エネルギー庁石油部海外開発課</p> <p>機材選定 塚田 紘也 財団法人 資源観測解析センター調査開発部課長</p> <p>研修計画 岩下 篤 財団法人 資源観測解析センター企画課長</p> <p>業務調整 高橋 悟 国際協力事業団 鉱工業開発協力部 鉱工業開発技術課</p>

1. 協力実施プロセス (続き)

(6) 専門家派遣開始	1990年3月10日
(7) 計画打合せ (担当/氏名/所属)	<p>1990年9月20日 ~ 1990年9月27日 (9日間)</p> <p>団長・総括 山口 公章 国際協力事業団 鉱工業開発協力部 鉱工業開発技術課課長代理</p> <p>技術協力計画 渡辺 誠 通商産業省 資源エネルギー庁石油部海外開発課 画像処理/映像 塚田 紘也 財団法人 資源観測解析センター調査開発部課長 石油地質 岩下 篤 財団法人 資源観測解析センター企画課長 運営管理 鈴木 薫 国際協力事業団 鉱工業開発協力部 鉱工業開発技術課</p>
(8) 巡回指導 (担当/氏名/所属)	<p>1991年3月11日 ~ 1991年3月19日 (9日間)</p> <p>団長・総括 笠間 孚彦 国際協力事業団 鉱工業開発協力部 鉱工業開発技術課課長代理</p> <p>技術協力計画 渡辺 誠 通商産業省 資源エネルギー庁石油部海外開発課 画像処理 塚田 紘也 財団法人 資源観測解析センター調査開発部課長 映像処理 岩下 篤 財団法人 資源観測解析センター企画課長 石油地質 青柳 宏一 財団法人 資源観測解析センター 湿度対策 村田 明 朝日工業株式会社 代表取締役 運営管理 鈴木 薫 国際協力事業団 鉱工業開発協力部 鉱工業開発技術課</p>
(9) 巡回指導 (担当/氏名/所属)	<p>1992年1月13日 ~ 1992年1月22日 (10日間)</p> <p>団長・総括 増田 聡博 通商産業省 通商政策局 技術協力課長 技術協力計画 西田 和史 外務省 経済協力局 技術協力課 石油地質 川上 亨 財団法人 資源観測解析センター 映像処理 山本 博 アジア航測株式会社 画像処理 塚田 紘也 財団法人 資源観測解析センター調査開発部課長 運営管理 鈴木 薫 国際協力事業団 鉱工業開発協力部 鉱工業開発技術課</p>
(10) 計画打合せ (担当/氏名/所属)	<p>1993年4月5日 ~ 1993年4月14日 (10日間)</p> <p>団長・総括 津 宏治 通商産業省工業技術院地質調査所 地殻物理部長 技術協力計画 市川 類 通商産業省 資源エネルギー庁石油部海外開発課 石油地質 青柳 宏一 財団法人 資源観測解析センター 映像処理 早川清二郎 アジア航測株式会社コソカト 事業部 技術部長 コンピュータ画像処理 塚田 紘也 株式会社地球科学総合研究所 開発二課長 運営管理 三好 省三 国際協力事業団 鉱工業開発協力部 鉱工業開発技術課</p>
3. 協力実施過程における 特記事項	なし
4. 他の協力事業との関連 性	なし

II. 目標達成度

案件名：インドネシア石油・ガスイメージング研究所協力事業

プロジェクト概要	指標	実績	外部条件
<p>【開発目標】 ・石油・天然ガスイメージング技術の応用 ・石油・天然ガス効果的探査の技術的支援</p>	<p>目標達成度の指標 ① 画像解析能力 ② 画像解析設備 ③ 技術普及</p>	<p>画像解析能力の向上に寄与した。 ・画像解析設備が充実した。 ・画像解析技術の普及に寄与した。</p>	<p>インドネシアでは、石油・天然ガス探査に、画像解析技術の導入が急務と見られており、画像解析技術の導入が必須不可欠。 ・画像解析技術の導入が必須不可欠。 ・画像解析技術の導入が必須不可欠。</p>
<p>【プロジェクトの目的】 ・石油・天然ガス探査の技術的支援 ・石油・天然ガス探査の技術的支援</p>	<p>当該プロジェクトの活動状況の確認 ① 画像解析設備の稼働 ② 画像解析データの送付 ③ 画像解析技術の普及 ④ 画像解析技術の普及 ⑤ 画像解析技術の普及 ⑥ 画像解析技術の普及</p>	<p>・'89年8月から'94年3月まで ① 6回/月 ② 2回/月 ③ 3回/月 ④ 1件以上</p>	<p>画像解析技術の確保 ・画像解析技術の確保 ・画像解析技術の確保 ・画像解析技術の確保</p>
<p>【プロジェクトの目的】 ・石油・天然ガス探査の技術的支援 ・石油・天然ガス探査の技術的支援</p>	<p>当該プロジェクトの活動状況の確認 ① 画像解析設備の稼働 ② 画像解析データの送付 ③ 画像解析技術の普及 ④ 画像解析技術の普及 ⑤ 画像解析技術の普及 ⑥ 画像解析技術の普及</p>	<p>技術移転はほぼ完了した。</p>	<p>教材等（マニュアル、ガイドライ ・教材等（マニュアル、ガイドライ ・教材等（マニュアル、ガイドライ ・教材等（マニュアル、ガイドライ</p>
<p>【活動目標】 ・石油・天然ガス探査の技術的支援 ・石油・天然ガス探査の技術的支援</p>	<p>《日本側インベンスメント》 (1) 画像解析設備 (2) 画像解析設備 (3) 画像解析設備 (4) 経費 《インドネシア側インベンスメント》 (1) 画像解析設備 (2) 画像解析設備 (3) 画像解析設備 (4) 経費</p>	<p>長期9人、短期24人 延べ33人 ・画像解析設備、画像入力装置、画像出力装置、画像処理装置、画像管理装置等 ・画像解析設備、画像入力装置、画像出力装置、画像処理装置、画像管理装置等 ・画像解析設備、画像入力装置、画像出力装置、画像処理装置、画像管理装置等 ・画像解析設備、画像入力装置、画像出力装置、画像処理装置、画像管理装置等</p>	<p>画像解析技術の確保 ・画像解析技術の確保 ・画像解析技術の確保 ・画像解析技術の確保</p>

III. 案件の効果

効果の内容 効果の 広がりと受益者	技術的 インパクト	制度的 インパクト	経済的 インパクト	社会文化的 インパクト	環境的 インパクト	その他の インパクト
プロジェクト・レベルの インパクトと受益者	移転された 技術により 、自力で技 術相談、セ ミナーを開 催し、外部 機関の研究 者、技術者 に対して技 術サービス を行える技 術力をつ けた。		外国石油会 社リモート センシング 技術を含ん だカリマン タン地域の 堆積盆評価 研究受託も 行っており 、他の国か ら同種の研 究の要望も ある。	外部研究機 関、大学、 企業と常に 交流があり 、非常にバ ランスのよ い技術交流 も行ってお り、外国と の交流もあ る。		
セクターレベルの インパクトと受益者	石油天然ガ ス研究所の 石油天然ガ スの探鉱、 開発、生産 に関する技 術の向上し 、石油探鉱 活動の活性 化、効率化 が図られた 。		研究設備の 充実及び自 主研究の企 画・開発能 力が高まり 、他の機関 から研究受 託による収 入が得られ た。			
地域へのインパクトと 受益者	移転された 技術をセミ ナー等によ る普及活動 のなかで積 極的に行っ ており、関 連機関への 波及効果が 認められた。	鉱山エネル ギー省石油 ・天然ガス 総局に属す る石油天然 ガス研究所 の中に技術 的実力を持 った同研究 所が設立さ れた。				
効果発生及びその広がり の要因（予期した効果が 発生しない場合の理由を 含む）	技術移転が 確実に行わ れ、同研究 所が技術の 習得したた めである。	左記に同じ	左記に同じ			

IV. 自立発展の見通し

<p>1. 組織的自立発展の見通し</p> <p>(1) 実施機関存立への政策的支援の有無</p> <p>(2) 管理運営体制</p> <p>(3) 組織の改廃</p>	<p>実施機関は鉱山エネルギー省傘下の石油天然ガス研究所であり組織図に示す通り、位置付けも明確であり、運営管理費の予算化とその確保は十分な行政能力を、持っていると判断する。</p> <p>この組織は管理能力を十分に備えた人材が配置されていて、実施体制を整えていると判断する。</p> <p>有 / (無) (改廃理由とその効果)</p>
<p>2. 財務的自立発展の見通し</p> <p>(1) 必要経費調達の見通し</p> <p>(2) 自主財源による費用回収状況</p> <p>(3) その他経費の調達</p> <p>(4) リカレント・コスト負担の必要性及び妥当性</p>	<p>実施機関は鉱山エネルギー省傘下の石油天然ガス研究所の組織であり、終了以降の経費調達の見通しは十分確保できると思われる。</p> <p>インドネシアの石油探鉱は、今後の積極的に行われ、外国石油会社からリモートセンシングを含んだカリマンタン地域の堆積盆評価の研究受託による収入も一部行われており、また、他にも外国石油会社から同種の研究の要望もあり、今後も収入確保の可能性は高い。</p>

IV. 自立発展の見通し（続き）

<p>3. 物的・技術的自立発展性 の見通し</p> <p>(1) 移転技術の内容及び技術 レベルの適正度</p> <p>(2) 要員配置状況</p> <p>(3) 技術の定着状況</p> <p>(4) 後継者の育成計画</p>	<p>移転すべき技術はその都度適切な専門家が派遣され、技術移転は予定通り行われ、その結果C/Pは基礎技術をほぼ完全に習得し、自主運営は十分できると判断する。</p> <p>要員及び人材は自主運営する上で適切な数が配置されたと言える。</p> <p>マニュアル、ガイドライン等の整備・活用により移転された技術を蓄積しており、自主運営は可能である。</p> <p>技術移転を受けたスタッフは、協力期間中に整理された諸資料などを活用して、新人に指導できると思われる。</p>
<p>4. その他管理運営上の 制約要因</p>	<p>(1) 技術移転を受けたスタッフの配転・転職が懸念されるので、配転の防止が必要である。</p> <p>(2) FTUは、今後地場企業に密着したサービスをするとともに、共同で開発していくという姿勢が大切である。</p>

V. フォローアップの必要性

<p>1. 協力期間延長の要否</p>	<p>要 / (否) (理由) 本プロジェクトは、当初計画通り技術移転が行われ、インドネシア側カウンターパートによる自立が可能であると評価できる。 このため、R/Dの予定通りプロジェクトを終了し、フォローアップや協力期間の延長の必要はない。</p>
<p>2. フォローアップの内容と方法</p> <p>(1) フォローアップの必要分野</p> <p>(2) フォローアップの内容</p> <p>(3) フォローアップの所要期間</p> <p>(4) 期待される効果</p>	

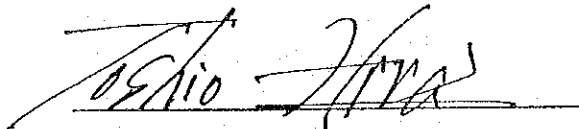
JOINT EVALUATION REPORT
ON
THE JAPANESE TECHNICAL COOPERATION
FOR
THE PROJECT ON IMAGE PROCESSING TECHNOLOGY
FOR
OIL AND GAS STUDY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
RESEARCH AND DEVELOPMENT CENTRE FOR OIL AND GAS TECHNOLOGY "LEMIGAS"

25 MARCH 1994
JAKARTA
THE REPUBLIC OF INDONESIA

MUTUALLY ATTESTED AND SUBMITTED
TO ALL CONCERNED

25 MARCH 1994
JAKARTA
THE REPUBLIC OF INDONESIA



Mr. TOSHIO HIRAI

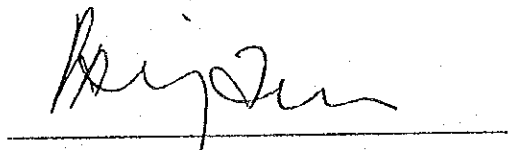
Leader

Japanese Evaluation Team

Japan International Cooperation

Agency

Japan



Dr. PRIYAMBODO MULYOSUDIRJO

Director

Research and Development Centre

for Oil and Gas Technology

"LEMIGAS"

The Republic of Indonesia

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- Annex 4. Schedule of Implementation and Accomplishment
- Annex 5. Technical Cooperation Programme
- Annex 6. Accomplishment of Technical Cooperation Programme
- Annex 7. Items of Technology Transfer
- Annex 8. Final Goal of the Project
- Annex 9. Organization Structure of "LEMIGAS"
- Annex 10. Technical Documents in Administration of the Image Processing
Laboratory
- Annex 11. List of Regular Meetings held in "LEMIGAS"
- Annex 12. List of Case Studies
- Annex 13. List of Seminars
- Annex 14. List of Visitors
- Annex 15. Japanese Experts dispatched by JICA
- Annex 16. Japanese Teams dispatched by JICA
- Annex 17. Counterpart Personnel trained in Japan
- Annex 18. Machinery and Equipment provided by JICA
- Annex 19. Expenses provided by the Japanese Side
- Annex 20. Organization Chart of the Implementation of the Project
- Annex 21. List of Counterpart Personnel
- Annex 22. Machinery and Equipment purchased by the Indonesian Side
- Annex 23. Expenses provided by the Indonesian Side

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I. INTRODUCTION

1. The Evaluation Teams

The Japanese Evaluation Team (hereinafter referred to as "the Japanese Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA"), and headed by Mr. Toshio Hirai, JICA, visited the Republic of Indonesia from 21 March to 29 March 1994 in order to jointly evaluate with the Indonesian Evaluation Team (hereinafter referred to as "the Indonesian Team") the achievement of the Japanese Technical Cooperation for the Project on Image Processing Technology for Oil and Gas Study (hereinafter referred to as "the Project") on the basis of the Record of Discussions signed on 21 August 1989 (hereinafter referred to as "the R/D").

The Japanese Team discussed and studied together with the Indonesian Team regarding the achievement, impact, sustainability and the future cooperation of the Project.

Through careful studies and discussions, both sides summarized their findings and observations as described in this report.

2. Schedule of the Japanese Evaluation Team

Date	Schedule
16 March 1994	(Consultant) - Meeting with the Japanese Experts
17 March 1994	- Meeting with the Japanese Experts
18 March 1994	- Meeting with the Indonesian Counterparts
19 March 1994	- Meeting with the Indonesian Counterparts
21 March 1994	- Meeting with the Indonesian scientists / engineers about the effect of technology transfer
22 March 1994	(Evaluation team) A.M. Discussion with the Japanese experts about the confirmation of schedule P.M. Meeting with the Indonesian scientists / engineers
23 March 1994	A.M. Meeting with the Indonesian Counterparts P.M. Meeting with the Indonesian Evaluation Team
24 March 1994	- Plenary Evaluation Meeting
25 March 1994	- Signing the Joint Evaluation Report Joint Committee Meeting
26 March 1994	- Drafting the Minutes of Discussions
28 March 1994	- Signing the Minutes of Discussions

3. Attendance

3-1 Japanese Side

1) Japanese Evaluation Team

Mr.Toshio Hirai	- Leader
Mr.Hideaki Yabe	- Technical Cooperation Planning
Dr.Koichi Aoyagi	- Petroleum Geology
Mr.Seijiro Hayakawa	- Computer / Image Processing / Remote Sensing
Mr.Koya Tsukada	- Project Data Collection
Mr.Hisaya Wada	- Coordinator

2) The Japanese Experts

Mr.Tsunekazu Ajiki	- Chief Advisor
Mr.Koji Tsujii	- Coordinator
Mr.Yuichi Maruyama	- Petroleum Geology
Dr.Toshiaki Hashimoto	- Remote Sensing
Mr.Isao Murakami	- Computer / Image Processing

3) JICA Indonesian Office

Ms.Fumiko Yamada

3-2 Indonesian Side

1) The Indonesian Evaluation Team

- Dr. Priyambodo Mulyosudirjo - Director, Research and Development Centre for Oil and Gas Technology "LEMIGAS", Head of the Project
- Dr. Bona Situmorang - Head, Research and Development Div. for Exploration Technology "LEMIGAS"
- Ir. Subijanto - Head, Research and Development Div. for Exploitation Technology "LEMIGAS"

2) Indonesian Counterparts

- Drs. Sarjono Dipowirjo - Deputy Head of the Project
- Ir. Muhamad Husen, MSc. - Research Geologist
- Ir. Sukismoyo Pusoko - Assistant Research Geologist
- Ir. Herru Lastiadi Setiawan - Assistant Research Geologist
- Drs. Hermansyah - Assistant Research Geophysicist
- Drs. Adji Gatot Tjiptono - Assistant Research Geophysicist
- Drs. Heribertus Joko Kristadi - Assistant Research Geophysicist
- Ir. Heru Riyanto - Assistant Research Geophysicist

II. METHODOLOGY OF EVALUATION

1. Evaluators

Indonesian Side : The Indonesian Evaluation Team

Japanese Side : The Japanese Evaluation Team

2. Materials for Evaluation

In order to evaluate the past performance and achievement both quantitatively and qualitatively, the following materials were used as reference:

(1) The Record of Discussions (The R/D)

(2) The Minutes of Discussions, the Annual Work Plans and other documents agreed on or accepted in the course of implementation of the Project

(3) The Logical Framework shown in Annex 1

III. BACKGROUND AND SUMMARY OF THE PROJECT

1. Brief Background of the Project

The Government of Japan and the Government of the Republic of Indonesia have been cooperating with each other in implementing the Project for the purpose of transferring appropriate technology in the field of the Image Processing Technology for Oil and Gas study and thus contributing to the effective exploration of oil and gas in the Republic of Indonesia.

Objectives of the technical cooperation during the term of the cooperation are to transfer appropriate technology to the Indonesian counterpart personnel so as to enable them to carry out the activities of the Project.

The appropriate technology transfer to the Indonesian counterpart personnel has been and will be done in the following three fields :

- Computer / Image Processing
- Remote Sensing (R/S)
- Petroleum Geology

The Project has been conducted at the Image Processing Laboratory of Research and Development Centre for Oil and Gas Technology "LEMIGAS"(hereinafter referred to as "LEMIGAS").

2. Chronological Review of the Project

The chronological review of the Project is shown in Annex 2.

3. Objectives of the Project

Objectives of the Project are to facilitate the research and development in Image Processing Technology and to apply them to the method of exploration of oil and gas in the Republic of Indonesia.

4. Tentative Schedule of Implementation

The Tentative Schedule of Implementation is shown in Annex 3.

IV. RESULTS OF EVALUATION

1. Output of the Project

1-1 Technology Transfer through the Project

1-1-1 Status of Technology Transfer

The present status of the Project is summarized as follows :

- Schedule of Implementation and Accomplishment shown in Annex 4
- Technical Cooperation Programme and Accomplishment shown in Annexes 5 and 6
- Items of Technology Transfer shown in Annex 7

In preparing images and geological maps, the Indonesian counterpart personnel have obtained the appropriate technology from the Japanese experts.

It is recognized that they have reached the level of competence to apply the technology in the oil and natural gas exploration.

1-1-2 Final Goal of the Project

The Japanese Consultation Team and the Indonesian Team discussed thoroughly in April 1993, and agreed that technology transfer would be completed by reaching the final goal. The Final Goal is shown in Annex 8.

1-2 Activities of the Project

The Image Processing Laboratory is one of the research laboratories within LEMIGAS. LEMIGAS organization structure as of 1 March 1994 is shown in Annex 9.

1-2-1 Management of the Image Processing Laboratory

Various documents were prepared in cooperation with the Japanese experts which describe how to manage the Image Processing Laboratory. Those documents are shown in Annex 10.

1-2-2 Regular Meetings in LEMIGAS

The Japanese experts and the Indonesian counterpart personnel frequently conducted regular meetings under the supervision of the Director of LEMIGAS. The list of regular meetings held in LEMIGAS is shown in Annex 11.

1-2-3 Case Studies

Case study is very important to study the applicability of remote sensing. A total of 6 case studies were carried out as shown in Annex 12.

1-2-4 Seminars

A total of 4 seminars have been and will be held during the period of the Project with participants from private companies and governmental organizations. The list of seminars is shown in Annex 13.

1-2-5 Contract Services

The Image Processing Laboratory was involved in a contract service awarded by Mobil Oil Indonesia.

1-3 Cooperation with other Institutions

The Image Processing Laboratory was frequently visited by Indonesian engineers / scientists from other scientific institutions, and they made technical discussions. The list of recent principal visitors is shown in Annex 14.

2. Input to the Project

2-1 Schedule of Implementation and Accomplishment

The accomplishment of the Project based on the Schedule of Implementation is shown in Annex 4.

2-2 Input by the Japanese Side

2-2-1 Dispatch of the Japanese Experts and the Survey Teams

JICA has dispatched nine(9) long term experts and twenty-four(24) short term experts and also, sent seven(7) survey teams in relation to the Project as shown in Annexes 15 and 16.

2-2-2 Training of the Indonesian Counterpart Personnel in Japan

Twelve(12) Indonesian counterpart personnel have been trained in Japan as shown in Annex 17.

2-2-3 Provision of Machinery and Equipment

Up to now, the machinery, equipment and materials equivalent to ¥259,831,000 have been provided by the Japanese Government through JICA as shown in Annex 18.

2-2-4 Expenses provided by the Japanese Side

Up to now, the total expenses of the Project by the Japanese Side was ¥715,639,000 as shown in Annex 19.

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2-3 Input by the Indonesian Side

2-3-1 Allocation of the Indonesian Counterpart Personnel and Administrative Personnel

To date the Indonesian side has allocated the personnel as shown in Annexes 20 and 21.

2-3-2 Purchase of Machinery and Equipment

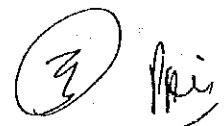
The machinery and equipment purchased by the Indonesian side with the total cost of Rp.48,650,000 is shown in Annex 22.

2-3-3 Renovation of the Laboratory

The Laboratory was renovated by the Indonesian side with the cost of Rp.55,000,000 in 1990 and 1992.

2-3-4 Expenses provided by the Indonesian Side

The total expenses of the Project by the Indonesian side was Rp.850,000,000 as shown in Annex 23.

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3. Impact of the Project

3-1 Details of Impact

After discussing with Indonesian scientists / engineers, the following results have been acquired :

- (1) The Project contributes to scientific institutions through technical discussions and seminars.
- (2) To promote cooperation with scientific institutions, the Project has provided various technical services in the field of image processing technology.
- (3) Requests to the Image Processing Laboratory :
 - Holding seminars to disseminate new technology and information
 - Further technical advices
 - Joint research

As a result of the implementation of the Project, there is a great expectation from other scientific institutions for Image Processing Laboratory to play a major role in providing technical consultation services in the future.

3-2 Dissemination of Impact and the Range of Beneficiaries

- (1) It is obvious that the Image Processing Laboratory can contribute to the development of the oil and gas industry by implementing the research activities in closer cooperation with other scientific institutions.
- (2) The Image Processing Laboratory disseminated the technology obtained during the Project to other scientific institutions and private companies by providing technical consultation services.

4. The Prospect of Sustainability

4-1 The Prospect of Sustainability from the Organizational Aspect

- (1) The Image Processing Laboratory is firmly positioned in LEMIGAS organization structure and will have enough resources and capability to sustain the achievement already acquired through the Project and to execute the future programmes.
- (2) It is believed that the Image Processing Laboratory has sufficient researchers to manage and implement the research and technical consultation activities.

4-2 The Prospect of Sustainability from the Financial Aspect

- (1) As the Image Processing Laboratory is a formal entity in the organization structure of LEMIGAS, it will continue to be supported and sustained after the termination of the Project.
- (2) LEMIGAS has a plan to increase its revenue by undertaking contract research activities with industry. It is likely that part of the cost to manage the Image Processing Laboratory will be funded by these contract research activities.

4-3 The Prospect of Sustainability from the Human Resources and Technical Aspects

- (1) Appropriate Japanese Experts were dispatched to transfer the necessary technology and thus contributed to the Image Processing Laboratory's sustainability to enable it to be administered adequately.
- (2) The Image Processing Laboratory has enough qualified researchers.
- (3) It is considered that researchers who have received technology transfer can advise their colleagues and subordinates by using standard procedures, manuals, textbooks, and seminar materials.

4-4 Other Administrative Consideration

- (1) It is desirable for researchers who have received the technology transfer to be retained by LEMIGAS to work at the Image Processing Laboratory.
- (2) It is important for the Image Processing Laboratory to cooperate with other scientific institutions to develop technology.

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V. EVALUATION

1. Technology Transfer

The evaluation was made based on the Technical Cooperation Programme and the Items of Technology Transfer as shown in Annexes 5, 6 and 7.

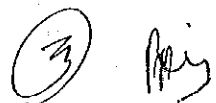
In general, most of the items of the technology transfer agreed upon in the R/D have been successfully implemented and reached the Final Goal as stipulated in Annex 8.

2. Training Programme of the Indonesian Counterpart Personnel in Japan

The training programme of the Indonesian counterpart personnel in Japan covered all areas as stipulated in the R/D. They expressed their satisfaction of the training programme prepared by JICA.

3. Maintenance and Operation of Machinery and Equipment

The machinery and equipment provided by JICA, as shown in Annex 18, have been put into practical use and are well maintained.

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VI. CONCLUSION

As a result of the discussions, the Joint Evaluation Teams reached the following conclusions :

- (1) In general, most activities of the Project as outlined in the R/D are coming to the final stage of implementation.
- (2) The successful implementation of the Project is largely due to the effective and sincere cooperation between the Japanese authorities and experts, and the Indonesian authorities and counterpart personnel, who have overcome most of the difficulties in the course of implementing the Project.
- (3) It is considered that the Indonesian counterpart personnel will be able to carry out research activities, technical consultation services, and seminars by themselves.

In conclusion, both Teams agreed that the technology transfer would be completed as planned and the Project should be terminated on 20 August 1994 as scheduled in the R/D.

VII. RECOMMENDATION

Based on the mutual basic understanding that the continuation of the research activities of the Image Processing Laboratory is necessary as a long term programme for the progress in the Republic of Indonesia and, at the same time, the self-reliance of the Image Processing Laboratory is very important to sustain the capabilities fostered from the results of the Project, both Teams agreed to recommend the followings :

- (1) That the Indonesian side takes measures to fully utilize all of the Image Processing Laboratory facilities, to establish collaborative relationship with other scientific institutions and the industry, to develop image processing technology and to generate income.
- (2) That the Japanese side takes measures to facilitate any possible governmental and non-governmental cooperation to enhance the progress of the Image Processing Laboratory after the termination of the Project.

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LOGICAL FRAMEWORK

Technical Cooperation for the Project on Image Processing Technology for Oil and Gas Study.		Evaluation Result	
Summary of Project	Verifiable Indicators	Attainment of project purpose	Conditions
<p><u>Objective of project (indirect effect)</u></p> <ul style="list-style-type: none"> • Application of image processing technology in the oil and natural gas exploration. 	<p><u>Attainment of project purpose</u></p> <ol style="list-style-type: none"> (1) Capability to process images (2) Facility of image analysis (3) Dissemination of the technology 	<ul style="list-style-type: none"> • The project has contributed to the improvement of capabilities. • Facility has been improved. • The project has contributed to the improvement of the laboratory management • The project has contributed to dissemination of the technology. 	<ul style="list-style-type: none"> • Development of oil and natural gas is the most important activity in Indonesia. It is urgently necessary to develop unexplored area for economical growth. Image processing technology and its related systems are absolutely needed to survey large unexplored area.
<p><u>Purpose of project (direct effect)</u></p> <p>The enhancement of research activity of image processing technology in the following three areas:</p> <ul style="list-style-type: none"> • Computer/image processing • Remote sensing • Petroleum geology 	<p><u>Inquiry about the activities</u></p> <ol style="list-style-type: none"> (1) Preparation of documents (2) Joint meetings (3) Conducting case studies (4) Seminars (5) Contract research service (6) Cooperation with others 	<p>Aug. 1989 - Mar. 1994</p> <p>6 items</p> <p>1-2 times/month</p> <p>6 times</p> <p>3 times</p> <p>1 item</p> <p>More than 6 times</p>	<ul style="list-style-type: none"> • Obtaining running costs. • Obtaining remote sensing data. • Retaining C/P at the laboratory. • Prospects of oil and gas exploration.
<p><u>Output of project</u></p> <ul style="list-style-type: none"> • Development of human resources to apply image processing technology to exploration activities. 	<ol style="list-style-type: none"> (1) Management of the laboratory. (2) Technology transfer in those three areas. (3) Preparation of educational materials. 	<ul style="list-style-type: none"> • The technology transfer almost completed as planned in the R/D. 	<ul style="list-style-type: none"> • Filing of manuals and other materials. • Instruction to other engineers/scientists.
<p><u>Activities</u></p> <ul style="list-style-type: none"> • Basic training about the items agreed upon in the R/D. • Practical training by using the systems provided. • Supporting case studies. • Specific training by short term experts. • Supporting the dissemination of the technology through technical consultation and seminars. 	<p><u>Inputs by the Japanese side</u></p> <ol style="list-style-type: none"> (1) Dispatch of the Japanese experts: 9 long-term experts, 24 short-term experts, 33 experts in total. (2) Training of Indonesian counterpart personnel in Japan: 12 persons (3) Provision of the machinery and equipment: Computer, image processing system, image input/output system, Small scale image processing systems, UPS, etc. (4) Expenses: ¥ 715,639,000 (Aug. 1989 - Mar. 1994) <p><u>Inputs by the Indonesian side</u></p> <ol style="list-style-type: none"> (1) Allocation of the Indonesian counterpart & administrative personnel: 10 persons and secretary. (2) Expenses: Rp.850,000,000. (3) Renovation of the laboratory: Rp. 55,000,000. (4) Purchase of the machinery and equipment: equivalent to Rp.48,650,000. 		

B. P. S.

CHRONOLOGICAL REVIEW OF THE PROJECT

Year	Month	Events
1987	Jul.	The Government of Indonesia requested to the Government of Japan for the technical cooperation.
1988	May	Dispatch of the project formulation survey team by JICA.
1988	Nov.- Dec.	Dispatch of the preliminary survey team.
1989	May Aug.	Dispatch of the expert survey team . Dispatch of the implementation survey team.
1990	Mar.	Training of the Indonesian counterpart personnel in Japan (3 persons: remote sensing, petroleum geology, computer/image processing).
	Jul.	Dispatch of the long term experts (3 persons: chief advisor, remote sensing, computer/image processing). Dispatch of the short term expert (petroleum geology).
	Aug.	Dispatch of the long term expert (petroleum geology).
	Sep.	Dispatch of the short term expert (5 persons: UPS installation, image processing system installation, film writer installation, Terra-Mar installation, computer software). Dispatch of the technical guidance team.
	Dec.	Dispatch of the short term expert (1 person: Terra-Mar operation).
1991	Mar.	Dispatch of the short term expert (1 person: photogrammetry). Dispatch of the technical guidance team.
	May	Dispatch of the short term expert (1 person: remote sensing geology). Training of the Indonesian counterpart personnel in Japan (1 person: petroleum geology).
	Jun.	Dispatch of the long term expert (1 person: coordinator). Dispatch of the short term expert (1 person: computer geology).
	Jul.	Training of the Indonesian counterpart personnel in Japan (1 person: observation).
	Aug.	Dispatch of the short term expert (1 person: remote sensing geology).
	Oct.	Training of the Indonesian counterpart personnel in Japan (1 person: computer/image processing). Dispatch of the short term expert (1 person: digital image processing).

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CHRONOLOGICAL REVIEW OF THE PROJECT

Year	Month	Events
1992	Jan.	Dispatch of the short term expert (2 persons: UPS inspection, remote sensing environment). Dispatch of the technical guidance team.
	Jun.	Dispatch of the short term expert (1 person: video-grammetry). Dispatch of the long term expert (1 person: computer/image processing).
	Jul.	Dispatch of the long term expert (1 person: chief advisor).
	Aug.	Dispatch of the short term expert (1 person: petroleum geology).
	Oct.	Training of the Indonesian counterpart personnel in Japan (3 persons: remote sensing, petroleum geology, computer/image processing).
1993	Jan.	Dispatch of the short term expert (2 persons: film writer inspection, GIS).
	Apr.	Dispatch of the consultation team.
	Jun.	Dispatch of the long term expert (1 person: petroleum geology).
	Jul.	Dispatch of the short term expert (1 person: microwave remote sensing).
	Sep.	Dispatch of the short term expert (1 person: terrain information processing). Training of the Indonesian counterpart personnel in Japan (2 persons: observation).
	Nov.	Dispatch of the short term expert (1 person: remote sensing geology).
1994	Feb.	Training of the Indonesian counterpart personnel in Japan (1 person: computer/image processing).
	Mar.	Dispatch of the evaluation team. Dispatch of the short term expert (3 persons: UPS inspection, image processing system, general system).

TENTATIVE SCHEDULE OF IMPLEMENTATION

Calendar Year	1989			1990			1991			1992			1993			1994		
	Fiscal Year	4 5 6 7	8 9 10 11	12 1 2 3	4 5 6 7	8 9 10 11	12 1 2 3	4 5 6 7	8 9 10 11	12 1 2 3	4 5 6 7	8 9 10 11	12 1 2 3	4 5 6 7	8 9 10 11	12 1 2 3		
Initial Layout Procedures																		
-R/D																		
-A/A. Form																		
-Place Order																		
-System Integration (In Japan)																		
Laboratory Renovation																		
-Construction																		
-Short Term Experts																		
Provision of Equipment																		
-First Shipment																		
-A/C																		
-C/CF																		
-Personal Computer																		
Following																		
-Shipment																		
-Main System																		
-Base																		
-Writer																		
(Others when necessary)																		
Installation & Test																		
-Short Term Experts																		
Dispatch of Long Term Experts																		
1) Chief Adviser																		
2) Computer Technology/ Digital Image Processing																		
3) Remote Sensing Technology																		
4) Petroleum Geology																		

M/C: Air Conditioner, C/CF: Constant Voltage Constant Frequency (Power Supply)

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Calendar Year	1989			1990			1991			1992			1993			1994		
	4 5 6 7	8 9 10 11	12 1 2 3	4 5 6 7	8 9 10 11	12 1 2 3	4 5 6 7	8 9 10 11	12 1 2 3	4 5 6 7	8 9 10 11	12 1 2 3	4 5 6 7	8 9 10 11	12 1 2 3	4 5 6 7	8 9 10 11	12 1 2 3
Short Term Expert A																		
B																		
C																		
D																		
E																		
Training in Japan																		
Group I																		
Group II																		
Group III																		
A1-A5 form																		

NOTES: This schedule is subject to conditions that necessary budget and other arrangements will be prepared for the implementation of the project.

This scope of technical cooperation is subject to change within the scope of the provisions given in the Record of Discussions.

Other short term experts will be dispatched when necessary during 1992 ~ 1994.

Distribution between the categories of training in Japan can be adjusted to accommodate the Indonesian needs.

Group I Engineer : Computer/Digital Image Processing

Group II Scientist : Remote Sensing (R/S)

Group III Engineer : Petroleum Geology

SCHEDULE OF IMPLEMENTATION AND ACCOMPLISHMENT

Work Plan Accomplishment

Activity	The 1st Year			The 2nd year			The 3rd Year			The 4th Year			The 5th year																
	1989			1990			1991			1992			1993			1994													
Calendar Year Month	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1. Field of Technical Cooperation																													
1. Computer and Image Processing																													
2. Remote Sensing																													
3. Application Method of Remote Sensing for Petroleum Exploration																													
4. Case Study																													
5. Seminar																													
2. Mission																													
1. Implementation Survey Team																													
2. Consultation Survey Team																													
3. Technical Guidance Team																													
4. Evaluation Survey Team																													
3. Experts																													
Long Term Experts																													
1. Chief Adviser																													
2. Remote Sensing																													
3. Computer																													
4. Petroleum Geology																													
5. Coordinator																													
6. Computer																													
7. Chief Adviser																													
8. Remote Sensing																													
9. Petroleum Geology																													
Short Term Experts																													
1. Petroleum Geology																													
2. Installation of UPS																													
3. Installation of Image Processor																													
4. Installation of Film Writer																													
5. Computer Software																													
6. Installation of Terra-Mar																													
7. Technique of Terra-Mar																													
8. Remote Sensing Geology/Photo Geo.																													
9. Remote Sensing Geology																													
10. Computer Geology																													
11. Remote Sensing Geology																													
12. Digital Image Processing																													
13. UPS Maintenance																													
14. Remote Sensing Environment																													
15. Videogrammetry																													
16. Remote Sensing Geology																													

A c t i v i t y	The 1st Year			The 2nd year			The 3rd Year			The 4th Year			The 5th year																							
	1989			1990			1991			1992			1993			1994																				
Calendar Year Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8				
17. Equipment Inspection 18. Geographic Information System 19. Microwave Remote Sensing 20. Digital Terrain Analysis 21. Remote Sensing Geology 22. IP9000 Inspection 23. Equipment Maintenance 24. UPS Inspection																																				
4. Training in Japan 1. Remote Sensing 2. Petroleum Geology 3. Computer 4. Petroleum Geology 5. Observation Tour 6. Computer 7. Remote Sensing 8. Petroleum Geology 9. Computer 10. Observation Tour 11. Observation Tour 12. Computer																																				
5. Provision of Equipment 1. VAX3900/Image Processor/etc. 2. Airconditioner/etc. 3. Car/etc. 4. Digitizer/etc. 5. Humidifier 6. Printer/Pen-plotter 7. Software 8. Replacement Parts for IP9000 9. Software, Film, Film Paper 10. Battery for UPS																																				

(3) *Handwritten signature*

TECHNICAL COOPERATION PROGRAMME

Calendar Year	1989			1990			1991			1992			1993			1994		
	Fiscal Year			Fiscal Year			Fiscal Year			Fiscal Year			Fiscal Year			Fiscal Year		
	4 5 6 7	8 9 10 11	12 1 2 3	4 5 5 7	8 9 10 11	12 1 2 3	4 5 6 7	8 9 10 11	12 1 2 3	4 5 6 7	8 9 10 11	12 1 2 3	4 5 6 7	8 9 10 11	12 1 2 3	4 5 6 7	8 9 10 11	12 1 2 3
1. Chief Adviser	R/D																	
2. Computer Dispatch of Long Term Experts																		
Fundamentals of Image Science System Maintenance Image Display Image Trans- formation Enhance of Image Image Scanning				Group I	Group I, II, III	Group I												Group I
3. Remote Sensing Dispatch of Long Term Experts																		
Fundamentals of R/S Sensor Physics Interpretation of R/S Image Ground Truth				Group I, II	Group II													Group II, III
4. Petroleum Geo. Dispatch of Long Term Experts																		Group II
Fundamentals of Petroleum Geology Remote Sensing Geology Interpretation Proccoring Geological Maps R/S and Exploration Ground Truth				Group III	Group I, II, III	Group III	Area A	Area B	Area C									Group I, II, III

NOTES: This schedule is subject to condition that necessary budget and other arrangements will be prepared for the implementation of the project. This scope of technical cooperation is subject to change within the scope of the provisions given in the Record of Discussions.

ACCOMPLISHMENT OF TECHNICAL COOPERATION PROGRAMME

Developed Technology Transfer	Project Year		The 1st Year			The 2nd Year			The 3rd Year			The 4th Year			The 5th Year		
	Year	Month	1989	1990	1991	1992	1993	1994	1992	1993	1994	1993	1994	1994	1994	1994	1994
1. COMPUTER SYSTEM																	
1-1 SYSTEM INSTALLATION AND TESTING																	
1-2 OPERATION																	
1-3 MAINTENANCE AND MANAGEMENT																	
2. DIGITAL IMAGE PROCESSING (JOIN WITH R/S FIELD)																	
2-1 PRE-PROCESSING (FORTRAN LANGUAGE)																	
2-2 MAIN PROCESSING																	
2-3 INPUT AND OUTPUT																	
2-4 ADVANCED IMAGE PROCESSING/ FUNDAMENTAL																	
3. CASE STUDY																	
3-1 NORTH SUMATRA AREA																	
3-2 CENTRAL SUMATRA AREA																	
3-3 EAST JAVA AREA																	
4. PREPARATION OF A DOCUMENT																	

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Developed Technology Transfer	Project Year		The 1st Year			The 2nd Year			The 3rd Year			The 4th Year			The 5th Year				
	Year	Month	1989	1990	1991	1992	1993	1994	1990	1991	1992	1993	1994	1990	1991	1992	1993	1994	
1. FUNDAMENTALS OF REMOTE SENSING (CONCEPT)			8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	
1-1 BASIC PRINCIPLES				-----															
1-2 DIGITAL IMAGE PROCESSING				-----															
1-3 APPLIED R/S																			
1-4 READING CIRCLE (PRACTICE OF PRESENTATION)																			
2. IMAGE PROCESSING AND PROGRAMMING (PRACTICE)																			
2-1 TERRA-MAR				-----															
2-2 PRE-PROCESSING																			
2-3 MAIN PROCESSING																			
2-4 INPUT AND OUTPUT																			
2-5 CLASSIFICATION																			
3. CASE STUDY																			
3-1 NORTH SUMATRA AREA																			
3-2 CENTRAL SUMATRA AREA																			
3-3 EAST JAVA AREA																			
4. PREPARATION OF A MANUAL																			

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Developed Technology Transfer	Project Year		The 1st Year			The 2nd Year			The 3rd Year			The 4th Year			The 5th Year			
	Year	Month	1989	1990	1991	1992	1993	1994	1989	1990	1991	1992	1993	1994	1989	1990	1991	
1. FUNDAMENTALS OF PETROLEUM GEOLOGY 1-1 SEDIMENTARY GEOLOGY 1-2 SUBSURFACE GEOLOGY 1-3 OIL/GAS FIELD 1-4 FORMATION EVALUATION 1-5 AIRPHOTO GEOLOGY & ANALOG-PROCESSING IN INDONESIA (BY "LEMIGAS")			8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	
2. APPLICATION OF REMOTE SENSING GEOLOGY 2-1 R/S GEOLOGY 2-2 INTERPRETATION 2-3 PREPARING GEOLOGICAL MAPS 2-4 R/S AND EXPLORATION																		
3. CASE STUDY 3-1 NORTH SUMATRA AREA 3-2 CENTRAL SUMATRA AREA 3-3 EAST JAVA AREA																		
4. PREPARATION OF A GUIDELINE																		



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ITEMS OF TECHNOLOGY TRANSFER

1. Computer/Image Processing

T C P	Details in Development	Goals
• Fundamentals of Image Science	• Fortran Language • Fundamentals of Image Science	
• System Maintenance	• System Operation • System Maintenance	• System Operation • Regular Maintenance and Management • Actions for Machine Trouble
• Image Display	• Input • Output	• Operation
• Image Transformation	• Pre-processing • Case Study	• Software Development
• Enhancement of Image	• Main Processing • Case Study	• Software Development
• Image Scanning	• Input	• Operation

2. Remote Sensing

• Fundamentals of Remote Sensing	• Basic Principles • Digital Image Processing • Applied R/S • Reading Circle	• Acquisition of Knowledge of Fundamentals
• Sensor Physics	• Basic Principles	• Acquisition of Knowledge of Fundamentals
• Interpretation of R/S Image	• TERRA-MAR • Pre-processing • Main Processing • Input-Output • Classification • Preparation of Manual • Case Study	• Data Management • Image Processing • Case Study
• Ground Truth	• Case Study	• Case Study

3. Petroleum Geology

• Fundamentals of Petroleum Geology	• Sedimentary Geology • Subsurface Geology • Oil and Gas Field • Formation Evaluation	• Acquisition of Knowledge of Fundamentals
• Remote Sensing Geology and Interpretation	• Photo Geology • Interpretation of Processed Image • Preparation of Guideline • Correspondence of Rock Minerals and Spectrum • Preparation of Guideline	• Preparation of Guideline • Preparation of Geological Map
• Preparing Geological Map	• Preparation of Geological Map • Preparation of Geological Section	• Preparation of Guideline • Preparation of Geological Map
• R/S and Exploration	• Superimpose of Developed Sites and Structure • Evaluation for Exploration Site	• Preparation of Guideline
• Ground Truth	• Detailed Positioning of the Observed Points • Relation of the Forest Condition and Lithology	• Case Study

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FINAL GOAL OF THE PROJECT

Final goals of technology transfer in this project are as follows:

[COMPUTER/IMAGE PROCESSING]

1. System operation

To understand the function of each machine and software, and to be able to operate and handle them properly following each procedure.

2. Regular maintenance and management

To understand the significance and items of regular maintenance and management of the image processing system, and to accomplish them completely.

3. Actions for machine trouble

To be able to inform the respective maker or agent of a state of trouble on machine, when any failure or malfunction happens.

4. Software development

To create the software necessary for image processing.

[REMOTE SENSING]

1. Acquisition of knowledge of fundamentals

To understand principles and theories on remote sensing and image processing.

2. Image processing

To be able to execute any kind of image processing method by using computer system.

3. Case study

To process remote sensing data completely in the case study, and to compile the work process and contents of image processing.

4. Data management

To acquire the data rapidly and exactly, and to manage MT data correctly.

[PETROLEUM GEOLOGY]

1. Acquisition of knowledge of fundamentals

To understand the fundamentals of general petroleum geology, the concept of remote sensing geology, and the image interpretation technique.

2. Case study

To make an image interpretation in the case study, and to make the verification of the result through a field check and by the use of current geological data.

3. Preparation of Guideline

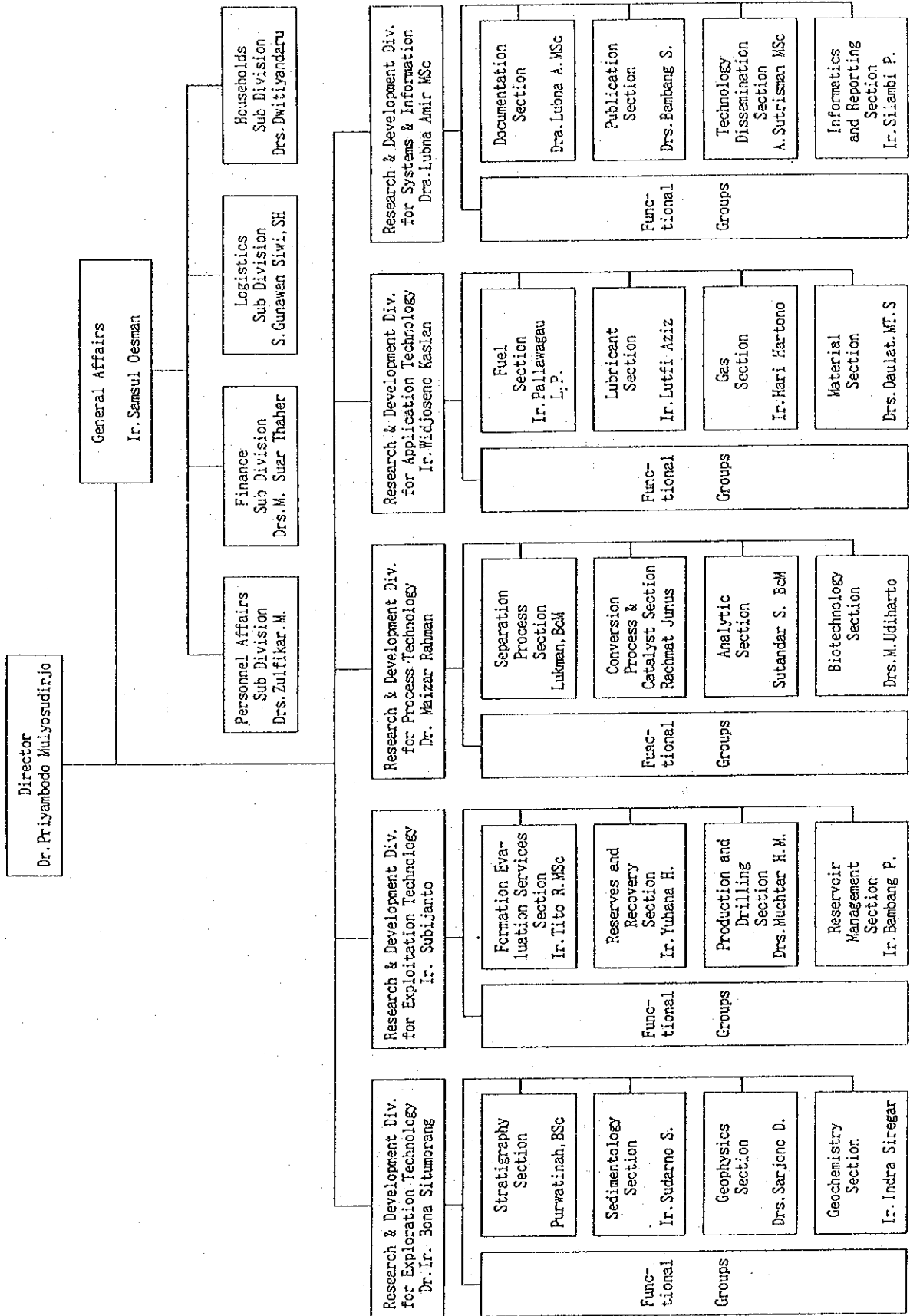
To make a guideline based on the examples of image analysis and interpretation gained from case studies. To compile the study-results on application of remote sensing technique to oil and gas exploration.

4. Preparation of geological maps

To be able to produce geological maps useful for planning of oil and gas exploration activities, based on the image output.

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ORGANIZATION STRUCTURE OF "LEMIGAS"



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TECHNICAL DOCUMENTS IN ADMINISTRATION OF THE IMAGE PROCESSING
LABORATORY

No	Name of Document
1	CCT List
2	Program List
3	Operation and Maintenance Manual for Computer System
4	Manual of Remote Sensing
5	Background Information for Programming
6	A Manual of Image Interpretation for Oil and Gas Exploration

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LIST OF REGULAR MEETINGS HELD IN LEMIGAS

Meetings	Purpose	Participant	Time
1. Japanese Expert Meeting	To review and discuss the activities of previous week and plan the schedule for the following week	All Japanese Experts	Weekly Friday morning
2. Japanese Expert and Indonesian Counterpart Meeting	To review the activities of the previous month and plan and schedule for the following month at officer/expert level	All Japanese Experts and Indonesian counterparts	Monthly
3. LEMIGAS Management Meeting	To discuss the overall activities of the project	LEMIGAS management staff	Quarterly

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LIST OF CASE STUDIES

Study	Area	Period	Purpose	Member	Data	Report	
						Japanese	English
1 Test Study	East Java	1991.4.24 ~ 4.29	To confirm applicability of remote sensing techniques to the area of tropical rain forest	Japanese Side 4	Landsat MSS	○	
2 Case Study	North Sumatra	1991.9.3 ~ 9.16	To study applicability of LANDSAT MSS data to geological survey in the coastal zone and mountainous area	Japanese Side 6 Indonesian Side 9	Landsat MSS 1/500,000		○
3 Case Study	Central Sumatra	1992.8.30 ~ 9.12	To confirm geological features after the stage of interpretation of image	Japanese Side 6 Indonesian Side 10	Landsat TM 1/250,000	○	○
4 Test Study	East Java	1992.11.2 ~ 11.5	To assess the effect of analyzing images such as combination of multi TM band, rationing, PCA	Japanese Side 4 Indonesian Side 4	Landsat TM	○	
5 Case Study	East Java	1993.9.1 ~ 9.11	To study rock unit delineation through the processed image To study relationship between rock type and spectral effects To verify the usefulness of the images for geological study and hydrocarbon exploration	Japanese Side 5 Indonesian Side 8	Landsat TM 1/100,000 Spot Stereo	○	○
6 Test Study	East Kalimantan	1993.11.23 ~ 11.27	To conduct feasibility study in Kalimantan island	Japanese Side 6 Indonesian Side 4	Landsat TM 1/225,000	○	

LIST OF SEMINARS

Date	Place	Theme	Lecturer	Attendance
1 1991.11.26	LEMIGAS	Inauguration of the Image Processing Laboratory Report Address Address	Dr. Rachman Subroto Mr. Tomoyuki Abe Mr. Suyitno Patmosukismo	MIGAS (4), LEMIGAS (23), JICA (7), Embassy of Japan (2), DPU (5), Pertamina, Jawa Oil, JETRO, INOCO, JAPEX, INPEX, LAPAN, ABRI, LIPI, SEIKAB, TVRI, ANIARA
2 1993.2.18	LEMIGAS	REMOTE SENSING TECHNOLOGY FOR DEVELOPMENT OF NATURAL RESOURCES 1) LAPAN's Remote Sensing Ground Station System and its Capacity for Natural Resources Exploration 2) Image Processing Techniques for the Information Extraction of the Landsat TM Imagery 3) Remote Sensing for Mining Exploration 4) Activity of PERAMINA 5) Geological Interpretation of Landsat TM Imagery	Dr. Mahdi Kartasasmita Mr. Adji Gatot Tjiptono Mr. Hermansyah Mr. H. Joko Kristadi Mr. Suwijanto Mr. Luki Samuel Ir. Muhammad Husen Ir. Sukismoyo Pusoko Ir. Herry Lastiadi S.	LEMIGAS (28), DPE, MIGAS (2), DPU (4) PERTAMINA (4), LAPAN (3), LIPI (2), P3G, PPGL, BAKOSURTANAL (4), ABRI, U. I., UNRI, TRISKTI, BPN, PT. Aneka Tambang, CALTEX (2), INPEX (2), UNOCAL SUMALINDO, IPB, INOCO, PT. Bhumih Prasaja (2), Mobil Oil, INKINDO, PENAS (2), Kompusindo, BP., PASCO, PT. Multimatra Prakarsa (2)
3 1993.6.24	Hotel Indonesia	THE TREND OF REMOTE SENSING 1) Remote Sensing in Future 2) Global GIS 3) Vegetation Mapping of Indochina Peninsula 4) Detecting Land Cover Changes of Suburban Area in Southeast Asia 5) Remote Sensing Acoustics 6) Why Remote Sensing 7) Satellite Monitoring of Solar Radiation for Global Primary Production Study 8) Introduction of CRESCENT 9) Demonstration & Animation	Prof. Shunji Murai Dr. Ryosuke Shibasaki Dr. Masataka Takagi Prof. Tsukasa Hosomura Mr. Toshiaki Ueki Mr. Kunikazu Tanaka Dr. Dennis G. Dye Mr. Mitsuharu Tokunaga Dr. Masataka Takagi	LEMIGAS, JICA, UI, JARS, GTZ, PT. Kayu Lapis Indonesia, PT. SEECONS, PT. Entopos, PT. Swamas, PT. Bumi Pra saja, PT. ADCO MIRINO, Dep. Transmig rasi, Dep. Kehutanan, PT. Cakrawala Meridian, PT. Megaplana, SEAMO BIOT ROP, PT. CERIA CONS. BAKOSURTANAL, CALTEX, DKI, PT. EXSA INT., PT. Inda h Karya, PT. ASCO NUSA, PT. MAPINDO PARAMA, PT. GEOPOLITAN, ITB, PT. Indo Georeka, Pasco, UNPAK, PT. Datascip, PT. Sarkindo Utama, etc.
4 1994.6 (Tentative)	LEMIGAS	Remote Sensing for Oil and Gas Exploration		

LIST OF VISITORS

No	Date	Institution/Company	Name	Purpose
1	1993	Ministry of Mines and Energy	Mr. I.B. Sudjana	Inspection
2	1993	China Oil Co.		Discussion
3	1993	Vietnam Oil Co.		Discussion
4	1993	JNOC		Discussion
5	April '93	LAPAN	Ms. Maria	Comparative Study
6	Aug. '93	Department of Petroleum Engineering Trisakti University	50 students	Observation/Discussion
7	Oct. '93	Leeds University		Discussion
8	Oct. '93	Asamera Oil Co.		Discussion
9	Nov. '93	Tri Hasta Co.	Dr. Wim C.	Business Orientation
10	Nov. '93	US Geological Survey		Discussion
11	Nov. '93	Australian Geological Survey Organization (A G S O)	Ms. Tidey	Discussion
12	Jan. '94	Geotek LIPI Bandung	Mr. Suwiyanto	Comparative study
13	Jan. '94	Sarana Putra Makmur P.T.	Mr. Chotob	Discussion
14	Feb. '94	Department of Geological Engineering Trisakti University	Ir. Agus Haryo and 30 students	Observation/Discussion

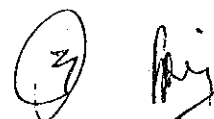
JAPANESE EXPERTS DISPATCHED BY JICA

(a) Long-Term Experts

- Chief Adviser
 1. Shunichiro Wakabayashi July 17, 1990 - July 16, 1992
 2. Tsunekazu Ajiki July 1, 1992 - August 20, 1994
- Coordinator
 3. Koji Tsujii June 13, 1991 - August 20, 1994
- Computer
 4. Tomohisa Kaneda July 17, 1990 - July 16, 1992
 5. Isao Murakami June 17, 1992 - August 20, 1994
- Remote Sensing
 6. Kazuya Saito July 17, 1990 - September 31, 1992
 7. Toshiaki Hashimoto December 15, 1992 - August 20, 1994
- Petroleum Geology
 8. Tadao Hoizumi August 15, 1990 - June 30, 1993
 9. Yuichi Maruyama June 25, 1993 - August 20, 1994

(b) Short-Term Experts

- Petroleum Geology
 1. Koichi Aoyagi July 22, 1990 - August 18, 1990
- Installation of UPS
 2. Kazuo Nishimura September 6, 1990 - September 19, 1990
- Installation of Image Processor
 3. Toshiharu Yoshimura September 9, 1990 - September 23, 1990
- Installation of Film Writer
 4. Kazuo Yorimitsu September 9, 1990 - September 23, 1990
- Computer Software
 5. Shinichi Hariu September 9, 1990 - November 18, 1990
- Installation of Terra-Mar
 6. Norio Ueno September 20, 1990 - October 4, 1990
- Technique of Terra-Mar
 7. Toshio Osanai December 1, 1990 - December 16, 1990
- Remote Sensing Geology/Photo Geology
 8. Ryouhei Imamura March 2, 1991 - March 14, 1991



- Remote Sensing Geology
9. Hiroshi Taketomi May 12, 1991 - May 24, 1991
- Computer Geology
10. Kazuo Nakayama June 23, 1991 - July 7, 1991
- Remote Sensing Geology
11. Yuichi Maruyama August 25, 1991 - September 21, 1991
- Digital Image Processing
12. Hiroshi Watanabe October 19, 1991 - November 1, 1991
- UPS Maintenance
13. Kazuo Nakamura January 9, 1992 - January 15, 1992
- Remote Sensing Environment
14. Seijiro Hayakawa January 26, 1992 - February 8, 1992
- Videogrammetry
15. Yoshiaki Takahashi June 13, 1992 - June 29, 1992
- Remote Sensing Geology
16. Osamu Takano August 26, 1992 - September 18, 1992
- Equipment Inspection
17. Kazuo Yorimitsu January 24, 1993 - January 30, 1993
- Geographic Information System
18. Akihiko Kondo January 31, 1993 - February 17, 1993
- Microwave Remote Sensing
19. Yasushi Yamaguchi July 6, 1993 - July 17, 1993
- Digital Terrain Analysis
20. Mitsuharu Tokunaga September 15, 1993 - September 29, 1993
- Remote Sensing Geology
21. Toyohiko Kanekiyo November 16, 1993 - November 30, 1993
- IP9000 Inspection
22. Toshiharu Yoshimura March 27, 1994 - April 2, 1994
- Equipment Maintenance
23. Tomohisa Kaneda March 27, 1994 - April 9, 1994
- UPS Inspection
24. Kazuo Nakamura March 30, 1994 - April 6, 1994



JAPANESE TEAMS DISPATCHED BY JICA

T E A M	P E R I O D
Project Formulation Survey Team (7)	May 22, 1988 - Jun. 1, 1988
Preliminary Survey Team (5)	Nov. 28, 1988 - Dec. 7, 1988
Expert Survey Team (3)	May 24, 1989 - May 31, 1989
Implementation Survey Team (5)	Aug. 14, 1989 - Aug. 22, 1989
Consultation Survey Team (5)	Sep. 20, 1990 - Sep. 27, 1990
Technical Guidance Team (7)	Mar. 11, 1991 - Mar. 19, 1991
Technical Guidance Team (6)	Jan. 13, 1992 - Jan. 22, 1992
Consultation Survey Team (6)	Apr. 5, 1993 - Apr. 14, 1993
Evaluation Team (6)	Mar. 21, 1994 - Mar. 30, 1994

COUNTERPART PERSONNEL TRAINED IN JAPAN

1.	Ir. Sukismoyo Pusoko	Petroleum Geology	90/3/28 ~90/6/30
2.	Dr. Suheimi Nurusman	Remote Sensing	90/3/28 ~90/6/30
3.	Drs. Donitson Pahala Pasaribu	Computer & Digital Image Processing	90/3/28 ~90/6/30
4.	Ir. Muhamad Husen MSc.	Petroleum Geology	91/5/12 ~91/8/3
5.	Drs. Sarjono Dipowirjo	Project Management	91/7/21 ~91/8/3
6.	Drs. Adji Gatot Tjiptono	Computer & Digital Image Processing	91/10/13~91/12/21
7.	Drs. Hermansyah	Remote Sensing	92/10/11~92/12/20
8.	Ir. Herru Lastiadi Setiawan	Petroleum Geology	92/10/11~92/12/20
9.	Drs. Heribertus Joko Kristadi	Computer & Digital Image Processing	92/10/11~92/12/20
10.	Dr. Priyambodo Mulyosudirjo	Project Management	93/9/27 ~93/10/3
11.	Dr. Bona Situmorang	Project Management	93/9/27 ~93/10/3
12.	Ir. Heru Riyanto	Computer & Digital Image Processing	94/1/29 ~94/3/26

MACHINERY AND EQUIPMENT PROVIDED BY JICA

Purchase No.	Item Model No.	Manufacturer	Serial No.	Price#1000	Location
90/05/--	JICA-Y-001 30KVA UPS CMC Series By-pass Panel Battery Panel Input transformer Panel Spare Parts	DENSEI		11,940 2,700 5,040 3,720 2,160	Lab.
	JICA-Y-002 UPS Distribution Panel	DENSEI		1,800	Lab.
	JICA-Y-003 UPS Remote Monitor Panel	DENSEI		1,008	D/C
90/08/20	JICA-Y-004 Micro Vax 3900 GP-1B Interface Board JEQ11-SF RS232 Interface Board CXY08-AA DMA Interface Board DPV11	Digital		43,815 523 378	Lab.
	JICA-Y-005 Stand for Terminal VT382 4sets	Digital		220	Lab.
	JICA-Y-006 Page Printer LN03S-JA	Digital		930	Lab.
	JICA-Y-007 User Terminal 4 sets	Digital		792	Lab.
	JICA-Y-008 Instruction Manuals 51volumes	Digital		834	Lab.
90/08/20	JICA-Y-009 Image Processor IP9515 Refresh Memory Board 5 sets Video Output Controller Board 2 sets Alpha-Numeric/cursor Generation Board Histogram Computation Board A/D Converter External Sync. Board Q-Bus Interface Board	Vicom		7,851 9,470 4,734 1,841 2,587 1,887 1,224 1,531	Lab.
	JICA-Y-010 Track Ball Device	Gould Inc.	706	525	Lab.
90/08/20	JICA-Y-011 Monitor TV GDM-1950	Sony	5000056	880	Lab.
90/08/20	JICA-Y-012 Densitometer TR924	Macbeth	3979A	1,350	Lab.

Location: Lab; Computer Room; Coordi.; Coordinator's Room; Japanese Expert Leader's Room
D/C; Computer Expert's Room; P/G; Petroleum Geology Expert's Room
R/S; Remote Sensing Expert's Room; Meeting; Meeting Room

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Purchase No.	Item Model No.	Manufacturer	Serial No.	Price¥1000	Location
90/08/20	JICA-Y-013 Color Film Writer C-4300-30D Spare Drum Cassette	Optronics		22,880 583	Lab.
	JICA-Y-014 OPT/DMA Interface Board	IMI		3,300	Lab.
90/08/20	JICA-Y-015 Developing Tool 81-06	Polaroid		209	Lab.
90/08/20	JICA-Y-016 Fujix Pictography 2000 Interface Cable	Fuji	0622370	3,800 70	Lab.
90/08/20	JICA-Y-017 CCD Camera DXC-3000AK Cable Box	Sony	52399	1,070 30 31	Lab.
	JICA-Y-018 Camera Stand VT-321	Daiwa		48	Lab.
	JICA-Y-019 Camera Control Unit CCU-M3	Sony		210	Lab.
	JICA-Y-020 Camera Adaptor CMA-8	Sony		61	Lab.
	JICA-Y-021 TV Monitor VM-X1000	Victor	15404196	200	Lab.
	JICA-Y-022 Operator Stand 1300 Light Box Others	CFC		220 100 100	Lab.
90/08/20	JICA-Y-023 Color Scanner JX-600 Interface Board	Sharp	90100077	2,500 200	Lab.
90/08/20	JICA-Y-024 Terra-Mar Tower/Monitor 2 sets Image Processor Board 2 sets			6,024 4,996	Lab. Passage
	JICA-Y-025 Monitor TV for Terra-Mar 2sets	Zenith	ZCMK190	1,506	Lab.Pass
	JICA-Y-026 Magnetic Tape Transport 2 sets	Anritsu	DMT2620M2	5,906	Lab.Pass
90/08/20	JICA-Y-027 Operator Desk PMT-38	Plus		53	Coordi.
	JICA-Y-028 Operator Desk CD-F128TH	Plus		49	Lab.
	JICA-Y-029 Operator Desk OD-R88H	Plus		91	Lab.
	JICA-Y-030 Operator Desk HS-127	Plus		40	Lab.

Purchase	No.	Item Model No.	Manufacturer	Serial No.	Price¥1000	Location
90/08/20	JICA-Y-031	Operator Desk OD-D46F3	Plus		36	Lab.
	JICA-Y-032	Operator Desk SD-MX188LM	Kokuyo		70	Passage
	JICA-Y-033	Operator Desk SD-MX168LM	Kokuyo		65	Lab.
	JICA-Y-034	Cabinet 2 sets	Kokuyo		111	Lab.
	JICA-Y-035	Lighting Box PM-2	Plus		126	Passage
	JICA-Y-036	Chairs GR-G3032ZKB3 7 PCS	Kokuyo		361	Lab.D/C
	JICA-Y-037	Handy Dark Room	Hansa		127	Passage
90/--/--	JICA-Y-038	Airconditioner CS-5BV10 2sets	National		2,000	Lab.
90/11/--	JICA-Y-039	Automobile Taft	Daihatsu	7937	3,025	Outside
90/11/14	JICA-Y-040	Refrigerator GR-702AF	Daiichi		161	Passage
	JICA-Y-041	Refrigerator NR-318	NEC		107	Passage
91/01/29	JICA-Y-042	Oscilloscope 2221A	Tektronix		700	Lab.
91/09/--	JICA-Y-043	Instant Camera Impulse AF	Polaroid		18	Coordi.
91/09/--	JICA-Y-044	Camera Body F3HP 2 PCS Lens Nikkor Zoom 28-85mm Lens Nikkor 20mm f2.8 Lens Nikkor 35mm f1.4 Lens Nikkor 50mm f1.4 Lens Nikkor Zoom 80-200mm Speedlight SB-16A 2 PCS Lens Case 4 PCS Camera Carrying Case	Nikon		274 63 65 76 34 101 72 3 3	Coordi.
91/12/19	JICA-Y-045	Personal Computer PC386GE2B RAM Board PCZR4 Mouse PCMS2 Dust Cover PC286DC	EPSON		363 40 5 1	R/S
	JICA-Y-046	Display PKD882	NEC		77	R/S

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Purchase No.	Item Model No.	Manufacturer	Serial No.	Price#1000	Location
91/12/19	JICA-Y-047 Printer VP1350PC Cut Sheet Feeder VP1350CSFS	EPSON		82 21	R/S
	JICA-Y-048 Transformer KD600 Table Tap SSI2001	TOYODEN		14 5	R/S
	JICA-Y-049 Computer Desk RAC-342	Sanwa		47	R/S
	JICA-Y-050 Software MS-Windows V3.0 PCW32	EPSON		21	R/S
92/03/27	JICA-Y-051 Dehumidifier CD-9001H 3 sets	National		558	Lab.Pass
92/05/20	JICA-Y-052 Digitizer 9500 16-button Cursor Interface Unit RS-70 Gas Pressure Support Stand	Calcomp	T008299	1,036 76 30 175	Lab.
92/05/20	JICA-Y-053 Software ATLAS GIS ATLAS Import/Export GIS ATLAS Draw ATLAS Import/Export Utilities DLG/ATLAS Conversion Module	Strategic Mapping Inc.		660 155 220 105 108	Lab.
	JICA-Y-054 PC Quick & QEMM	Quarterdeck		82	Passage
92/05/20	JICA-Y-055 Optronics Power Supply XE30-5 XM30-9 XM30-12 XM30-15 1557	Optronics		65 65 65 55 600	Lab.
92/05/20	JICA-Y-056 IP9000 Power Supply	Vicom		985	Lab.
92/05/20	JICA-Y-057 Thermo Hygograph 3-1124 2sets	Isuzu		136	Lab.
92/05/20	JICA-Y-058 Power Supply PD18-10D	KENWOOD		127	Passage
92/08/12	JICA-Y-059 Printer LQ-2550	EPSON		173	Lab.
92/09/30	JICA-Y-060 Pen Plotter, HP DraftPro DXL Programmer's Reference Manual	Hewlett Packard		607 10	Passage
93/03/16	JICA-Y-061 Software Easi Pace	PCI		6,270	Lab.

Purchase No.	Item Model No.	Manufacturer	Serial No.	Price#1000	Location
92/05/20	JICA-Y-057 Thermo Hygrograph 3-1124 2sets	Isuzu		136	Lab.
92/05/20	JICA-Y-058 Power Supply PD18-10D	KENWOOD		127	Passage
92/08/12	JICA-Y-059 Printer LQ-2550	EPSON		173	Lab.
92/09/30	JICA-Y-060 Pen Plotter HP DraftPro DXL Programmer's Reference Manual	Hewlett Packard		607 10	Passage
93/03/16	JICA-Y-061 Software Easi Pace	PCI		6,270	Lab.
94/01/26	JICA-Y-062 Mac Quadra 840AV 32/1000 W/CD	Apple	XB351JVKBY		D/C
	JICA-Y-063 Mouse II	Apple	HB341JSYTT18		D/C
	JICA-Y-064 Adjustable Keyboard	Apple	AP306452		D/C
	JICA-Y-065 Mac 21 Color Display	Apple	F825173NA01	US\$11,597	D/C
JICA-Y-066	Color Printer SCSI Peripheral Cable 50/50 SCSI HDI-30	Apple	CC309MK8		D/C
JICA-Y-067	128MB Optical 3.5" Cartridge	Apple	L304378	US\$1,700	D/C
JICA-Y-068	Color Scanner SCSI Peripheral Cable 50/50	Apple	TF321150LG1	US\$1,575	D/C
JICA-Y-069	Software Persuasion 2.1	Aldus		US\$452	D/C
JICA-Y-070	Software Freehand 3.1	Aldus		US\$542	D/C
JICA-Y-071	Software Photoshop 2.0	Aldus		US\$700	D/C
JICA-Y-072	Software Office	Microfoft		US\$599	D/C
JICA-Y-073	Software C++	Syantec		US\$500	D/C
JICA-Y-074	Software Norton Utilities	Syantec		US\$150	D/C
JICA-Y-075	Software Wing 2	Informix		US\$500	D/C
94/02/14	JICA-Y-076 Montage FR2 Film Recorder	Presentation	S0342274B	US\$7,500	D/C

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Purchase No.	No.	Item Model No.	Manufacturer	Serial No.	Price#1000	Location
94/03/16	JICA-Y-077	JERS-1 SAR DATA 124-296	NASDA	H2B33312007	375	Passage
	JICA-Y-078	JERS-1 SAR DATA 124-297	NASDA	G2B33236086	375	Passage
	JICA-Y-079	JERS-1 SAR DATA 124-298	NASDA	F3B38662129	375	Passage
	JICA-Y-080	JERS-1 SAR DATA 126-296	NASDA	F3B38662122	375	Passage
94/03/	JICA-Y-081	Power Supply Apparatus 2sets	Vicom	HC10-C1110	1,872	Lab.
	JICA-Y-082	Power Supply Apparatus	Vicom	HC20-1	1,228	Lab.
94/03/	JICA-Y-083	Alpha-Numeric Cursor Gen. Board	Vicom	IP9ANCG	2,300	Lab.
	JICA-Y-084	Image Refresh Board 2sets	Vicom	IP9MEM	4,740	Lab.
	JICA-Y-085	Image Processor Histogram Board	Vicom	IP9DVPHST	3,040	Lab.
	JICA-Y-086	RGB A/D Converter Board	Vicom	IP9DIGT3	2,300	Lab.
	JICA-Y-087	Circuit Board	Vicom	IP9PLL	1,490	Lab.
	JICA-Y-088	Software PCI Radar			7,542	Lab.
	JICA-Y-089	Software IMSL Mathematics Statistics Library			5,673	Lab.
	JICA-Y-090	LED Modulator	Optronics		512	Lab.
	JICA-Y-091	Step Controller	Optronics		366	Lab.
	JICA-Y-092	Interface	Optronics	100-80	146	Lab.
	JICA-Y-093	Glow Tube Modulator	Optronics		527	Lab.
	JICA-Y-094	Detector Assembly	Optronics		190	Lab.
	JICA-Y-095	PDTII Interface	Optronics		1,170	Lab.
	JICA-Y-096	Shaft Encoder	Optronics		730	Lab.
94/03/	JICA-Y-097	Battery W/Bolt & Nut 72PCS	DENSEI		4,104	Lab.
	JICA-Y-098	Fan & Alarm, Fuse	DENSEI		374	Lab.

Purchase No.	No.	Item Model No.	Manufacturer	Serial No.	Price¥1000	Location
90/10/18	JICA-K-001	Copy Machine NP-1215	Canon	DN812731	392	Passage
90/12/10	JICA-K-002	Personal Computer PC286 Book Mouse PC	EPSON		220 5	R/S
	JICA-K-003	Printer VP550PC Cut Sheet Feeder VP550CSFS	EPSON		73 13	D/C
	JICA-K-004	Transformer	HAKKO		10	D/C
	JICA-K-005	Software MS-DOS Ver.4.01	Micro Soft		15	D/C
	JICA-K-006	Software Ichitaro Ver.3	Just System		49	D/C
	JICA-K-007	Software Wordstar Ver.5.0	Wordstar		83	Coordi.
90/12/10	JICA-K-008	Video Camera AG420 Accessory Kit Battery VWBF1 2 sets Carrying Case VWSHS10	National	F9CA00080	315 32 16 25	Coordi.
90/12/10	JICA-K-009	TV AVS250M	JVC	12540136	142	Meeting
	JICA-K-010	Video Deck HRD337MS	JVC	105L3062	130	Meeting
	JICA-K-011	TV Stand			13	Meeting
90/12/10	JICA-K-012	Paper Cutter SS12	Plus	2.8.22C	16	Passage
92/02/21	JICA-K-013	Word Processor PWP50CWEX Battery pack PWP50CWEX-BA1 Battery Charger PWP50CWEX-BC1 Carrying Case PWP50CWCS4	NEC	0151478BBC	98 4 5 8	Coordi.
	JICA-K-014	Printer PWP50CWEX-PR1	NEC	0200008BA	34	Coordi.
92/02/21	JICA-K-015	Transformer / plug set TA-120	Koden		12	Leader
92/02/21	JICA-K-016	Printer CWBJ15	Canon	6E1012908	68	Coordi.
92/02/21	JICA-K-017	RAM Board ESB2000 for EPSON	Merco		34	R/S

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Purchase No.	Item Model No.	Manufacturer	Serial No.	Price¥1000	Location
92/06/12	JICA-K-018 Personal Computer PC9801NC 2x Mouse PC9801N22 2PCS Battery Pack PC9801N16 2PCS Carrying Case PC9801N20 2PCS Hard Disk Pack PackE-80 2PCS RAM Board RCD4000 2PCS Key Board Cover 2PCS FDD Cable CB-98ND010 2 PCS	NEC		1,016 18 24 26 224 132 4 16	D/C
	JICA-K-019 Floppy Disk Drive SFD32 2PCS	Logitech		90	D/C
	JICA-K-020 Printer BJ10V Cable IFC9800/15 Cable PC9801N22 Sheet Feeder ASF6410	Canon Canon NEC Canon		70 4 6 8	D/C
	JICA-K-021 Printer Desk Jet500J Cable PC9801N22 Sheet Feeder ASF6410	Hewlett Pack ard NEC Canon		86 4 8	Coordi.
	JICA-K-022 Modem PVA24B5	Aiwa		35	Coordi.
92/06/12	JICA-K-023 Software MS-DOS Ver. 3.3 D	NEC		9	Coordi.
	JICA-K-024 Software PS98-1001-32	NEC		8	Coordi.
	JICA-K-025 Software Neo Back Up	Mets		15	Coordi.
	JICA-K-026 Software MS Fortran Ver4.1	Microsoft		86	R/S
	JICA-K-027 Software Men's Mam	Technical So		9	Coordi.
	JICA-K-028 Software Hyper Fram ET	Digital Arts		86	Coordi.
	JICA-K-029 Software Turbo C++ Ver.1.0	Borland		18	R/S
	JICA-K-030 Software Debugger & Tool	Borland		26	D/C
92/06/12	JICA-K-031 Software JUSE-QCAS/MAI			86	D/C
92/06/12	JICA-K-032 Transformer TDS006E 5 PCS	Sanyo		33	Coordi.
92/06/12	JICA-K-033 Transformer KD-600 2 PCS	Toyozumi		26	Coordi.

Purchase No.	Item Model No.	Manufacturer	Serial No.	Price#1000	Location
92/06/12	JICA-K-034 UPS MUK0565 3 PCS	DENSEI		291	Coordi.
92/06/12	JICA-K-035 Hard Disk LHDS240H for Pasocom	Nihon Teksa	22JR40413	160	R/S
92/06/12	JICA-K-036 Repro Copy Outfiter PF4 Lighting Unit PL3	Nikon		45 20	Coordi.
92/06/12	JICA-K-037 Word Processor α 75 3 sets Key Board Cover 3 PCS Carrying Case LB02 3 PCS	Canon	EE1027968	504 6 39	Coordi. P/G
92/06/12	JICA-K-038 Tape Writer TR-77	KING JIM		39	Coordi.
	JICA-K-039 Tape Writer TR-55R	KING JIM		20	Coordi.
92/06/12	JICA-K-040 Slide Projector 253AF	Elmo	531800F	130	Coordi.
92/06/12	JICA-K-041 Over Head Projector HA-A305	Elmo	604954	250	Coordi.
92/09/12	JICA-K-042 Word Processor 30-AX301 Oasis	Fujitsu		209	D/C
92/09/12	JICA-K-043 Word Processor JW-01 Rupo	Toshiba		166	Leader
92/11/14	JICA-K-044 Power Supply for IP9000	Vicom		827	Lab.
92/12/15	JICA-K-045 GPS KX-G5500	National	2HADAA001318	150	D/C
92/12/15	JICA-K-046 Frame Memory SuperFrame ² Σ	Sapience		160	R/S
93/06/25	JICA-K-047 Mac Powerbook 180 8MB/HD8	Apple		527	P/G
	JICA-K-048 Mac Printer Style Writer II Accessory Kit	Apple		51 2	P/G
93/06/25	JICA-K-049 Transformer SE-200			7	P/G
93/07/06	JICA-K-050 Radar R/S A Training Manual	RadarSat Int	ISBN 0-9693733-0-9	50	R/S

Purchase	No.	Item, Name	Manufacturer	Model, Serial	Price (Rp.)	Account No.	Location
91/04/09	JICA-G-001	Desk Lamp	Flourscent	18wat	135,000	H3-IPP-87	P/G
91/04/09	JICA-G-002	Desk Lamp	Flourscent	18wat	135,000	H3-IPP-87	M/R
91/05/25	JICA-G-003	Desk Lamp	Flourscent	18wat	125,000	H3-IPP-97	D/C
91/05/29	JICA-G-004	Desk Lamp	Halogen	G15549	125,000	H3-IPP-104	M/R
91/06/01	JICA-G-005	Desk Lamp	National	SOQ-927H	215,000	H3-IPP-107	Leader
91/06/15	JICA-G-006	Tape Printer, Ptouch	Brother	PT8 J09808095	371,900	H3-IPP-120	Coordi.
91/09/27	JICA-G-007	TM DATA	NRCThailand	CTF2S129-57	7,684,835	H3-KEN-181B	Lab.
91/11/23	JICA-G-008	Laser Pointer	Plus	LP-10	400,000	H3-KEN-222	Coordi.
91/11/25	JICA-G-009	Explanation Panel A	C.V.H&U Budi		300,000	H3-RIN-18	Lab.
91/11/25	JICA-G-010	Explanation Panel B	C.V.H&U Budi		300,000	H3-RIN-18	Lab.
91/11/28	JICA-G-011	Magnetic Tape Cabinet Elite		438-4CR	1,071,600	H3-KEN-227	Lab.
91/11/28	JICA-G-012	Computer Desk	Victor	TD-186	109,250	H3-KEN-227	D/C
91/11/29	JICA-G-013	Emergency Lamp	F T		50,000	H3-IPP-229	Coordi.
91/12/02	JICA-G-014	Key Box	TATAKeyhouse	20key	96,025	H3-IPP-235	D/C
91/12/02	JICA-G-015	Emergency Lamp	Stardust	SLF-808	161,000	H3-KEN-236	Leader
91/12/02	JICA-G-016	Emergency Lamp	Stardust	SLF-808	161,000	H3-KEN-236	P/G
91/12/02	JICA-G-017	Emergency Lamp	Stardust	SLF-808	161,000	H3-KEN-236	R/S
91/12/02	JICA-G-018	Emergency Lamp	Stardust	SLF-808	161,000	H3-KEN-236	D/C
91/12/02	JICA-G-019	Emergency Lamp	Stardust	SLF-808	161,000	H3-KEN-236	Lab.
91/12/03	JICA-G-020	Folding Chair	Chitose		29,925	H3-HIN-240	M/R
91/12/03	JICA-G-021	Folding Chair	Chitose		29,925	H3-HIN-240	M/R
91/12/03	JICA-G-022	Folding Chair	Chitose		29,925	H3-HIN-240	M/R

Purchase No.	Item, Name	Manufacturer	Model, Serial	Price (Rp.)	Account No.	Location
91/12/03	JICA-G-023 Folding Chair	Chitose		29,925	H3-HIN-240	M/R
91/12/03	JICA-G-024 Folding Chair	Chitose		29,925	H3-HIN-240	M/R
91/12/03	JICA-G-025 TM DATA	NRCThailand	CTF2S119-60	US\$4,200	H3-RIN-21,22	Lab.
91/12/03	JICA-G-026 TM DATA	NRCThailand	CTQ2S127-60	US\$2,100	H3-RIN-21,22	Lab.
91/12/03	JICA-G-027 TM DATA	NRCThailand	CTQ2S127-61	US\$2,100	H3-RIN-21,22	Lab.
91/12/09	JICA-G-028 Direct Projector	Plus	EP-10	2,952,000	H3-KEN-251	M/R
91/12/25	JICA-G-029 UPS	SENDON	LIPS-650T	855,000	H3-IPP-259	R/S
92/01/22	JICA-G-030 Computer Desk	Victor	CD-186	120,000	H3-IPP-17	P/G
92/03/23	JICA-G-031 Filing Cabinet	General	OFL-50	175,525	H3-KEN-74	Coordi.
92/03/23	JICA-G-032 White Board	Daiko	90 x 120 cm	74,250	H3-HIN-75	Passage
92/03/25	JICA-G-033 Cabinet	Elite	438	417,500	H3-IPP-76	Leader
92/03/30	JICA-G-034 Magnetic Tape Cabinet	Elite	438-4CR	1,024,000	H3-KEN-82	Passage
92/04/28	JICA-G-035 Exhaust Fan	National		80,100	H4-HIN-4	Lab.
92/04/28	JICA-G-036 Exhaust Fan	National		80,000	H4-HIN-5	Lab.
92/06/29	JICA-G-037 Cabinet	Daiichi	2 door	418,500	H4-IPP-61	Passage
92/07/23	JICA-G-038 Cabinet	Elite	438	414,400	H4-IPP-91	Coordi.
92/08/03	JICA-G-039 Cabinet	Elite	436	261,400	H4-IPP-107	Coordi.
92/08/13	JICA-G-040 Clinometer			275,500	H4-KEN-122	P/G
92/10/13	JICA-G-041 Transceiver	ICOM	IC2iA 01189	495,000	H4-KEN-191	Coordi.
92/10/13	JICA-G-042 Transceiver	ICOM	IC2iA 01196	495,000	H4-KEN-191	Coordi.
92/12/19	JICA-G-043 Computer Table	order		425,000	H4-KEN-255	Lab.
93/02/02	JICA-G-044 TM DATA	NRC Thailand	CTF2S 117 NS	8,706,280	H4-KEN-311	Lab.

Purchase	No.	Item, Name	Manufacturer	Model, Serial	Price (Rp.)	Account No.	Location
93/02/24	JICA-G-045	Cabinet	Elite	438	476,500	H4-KEN-361	Coordi.
93/03/03	JICA-G-046	White Board	Ponall	120x200	172,000	H4-KEN-374	M/R
93/03/03	JICA-G-047	Soft Board		120x200	150,000	H4-KEN-374	Coordi.
93/03/03	JICA-G-048	Soft Board		120x200	150,000	H4-KEN-374	P/G
93/03/03	JICA-G-049	Soft Board		120x200	150,000	H4-KEN-374	M/R
93/03/03	JICA-G-050	Soft Board		120x200	150,000	H4-KEN-374	M/R
93/03/03	JICA-G-051	Soft Board		120x200	150,000	H4-KEN-374	M/R
93/03/04	JICA-G-052	SPOT DATA CD	SPOT Image	295-364 1X	2,295,300	H4-KEN-377	R/S
93/03/04	JICA-G-053	SPOT DATA CCT	SPOT Image	295-364 1X	857,670	H4-KEN-377	Lab.
93/03/04	JICA-G-054	SPOT DATA CD	SPOT Image	295-364 1P	5,929,110	H4-KEN-377	R/S
93/03/04	JICA-G-055	SPOT DATA CCT	SPOT Image	295-364 1P	857,670	H4-KEN-377	Lab.
93/03/04	JICA-G-056	SPOT DATA CD	SPOT Image	294-364 2X	2,295,300	H4-KEN-377	R/S
93/03/04	JICA-G-057	SPOT DATA CCT	SPOT Image	294-364 2X	857,670	H4-KEN-377	Lab.
93/03/04	JICA-G-058	SPOT DATA CD	SPOT Image	298-364 1X	2,295,300	H4-KEN-377	R/S
93/03/04	JICA-G-059	SPOT DATA CCT	SPOT Image	298-364 1X	857,670	H4-KEN-377	Lab.
93/03/04	JICA-G-060	SPOT DATA CD	SPOT Image	337-354 1X	2,295,300	H4-KEN-377	R/S
93/03/04	JICA-G-061	SPOT DATA CCT	SPOT Image	337-354 1X	857,670	H4-KEN-377	Lab.
93/03/15	JICA-G-062	Cabinet	Elite	439	239,000	H4-IPP-393	M/R
93/03/15	JICA-G-063	Magnetic Tape Cabinet	Elite	438-4CR	780,000	H4-KEN-394	D/C
93/03/15	JICA-G-064	Magnetic Tape Cabinet	Elite	438-4CR	780,000	H4-KEN-394	Lab.
93/03/16	JICA-G-065	Map Cabinet	Elite	440	1,039,150	H4-KEN-395	Passage
93/06/04	JICA-G-066	Mouse	Logitec		225,000	H5-IPP-51	Lab.

Purchase No.	Item, Name	Manufacturer	Model, Serial	Price (Rp.)	Account No.	Location
93/06/07	JICA-G-067 Puncher	Lion	260	288,900	H5-IPP-53	Passage
94/01/14	JICA-G-068 TM DATA	Indica Dharma	117/60	8,820,000	H5-KEN-286	Passage
94/01/14	JICA-G-069 TM DATA	Indica Dharma	116/61	8,820,000	H5-KEN-286	Passage
94/02/02	JICA-G-070 Geoport Telecom Adaptor	Apple		320,500	H5-IPP-300	D/C
94/02/10	JICA-G-071 Software Windows 3.1			157,000	H5-IPP-306	D/C
94/03/03	JICA-G-072 Computer Table	Oliver	CD-140	215,000	H5-IPP-342	D/C
94/03/03	JICA-G-073 Holding Chair 5PCS	Chitose	HAA	162,500	H5-IPP-343	Meeting
94/03/04	JICA-G-074 TM DATA	Indica Dharma	130/57	8,820,000	H5-KEN-346	Passage
94/03/11	JICA-G-075 Software Maclink Plus			312,400	H5-KEN-358	D/C
94/03/17	JICA-G-076 Software MVP Bundle			178,450	H5-KEN-361	D/C
94/03/17	JICA-G-077 Software Click Art CD			283,800	H5-KEN-361	D/C
94/03/17	JICA-G-078 Software 1000 Front CD			206,400	H5-KEN-361	D/C

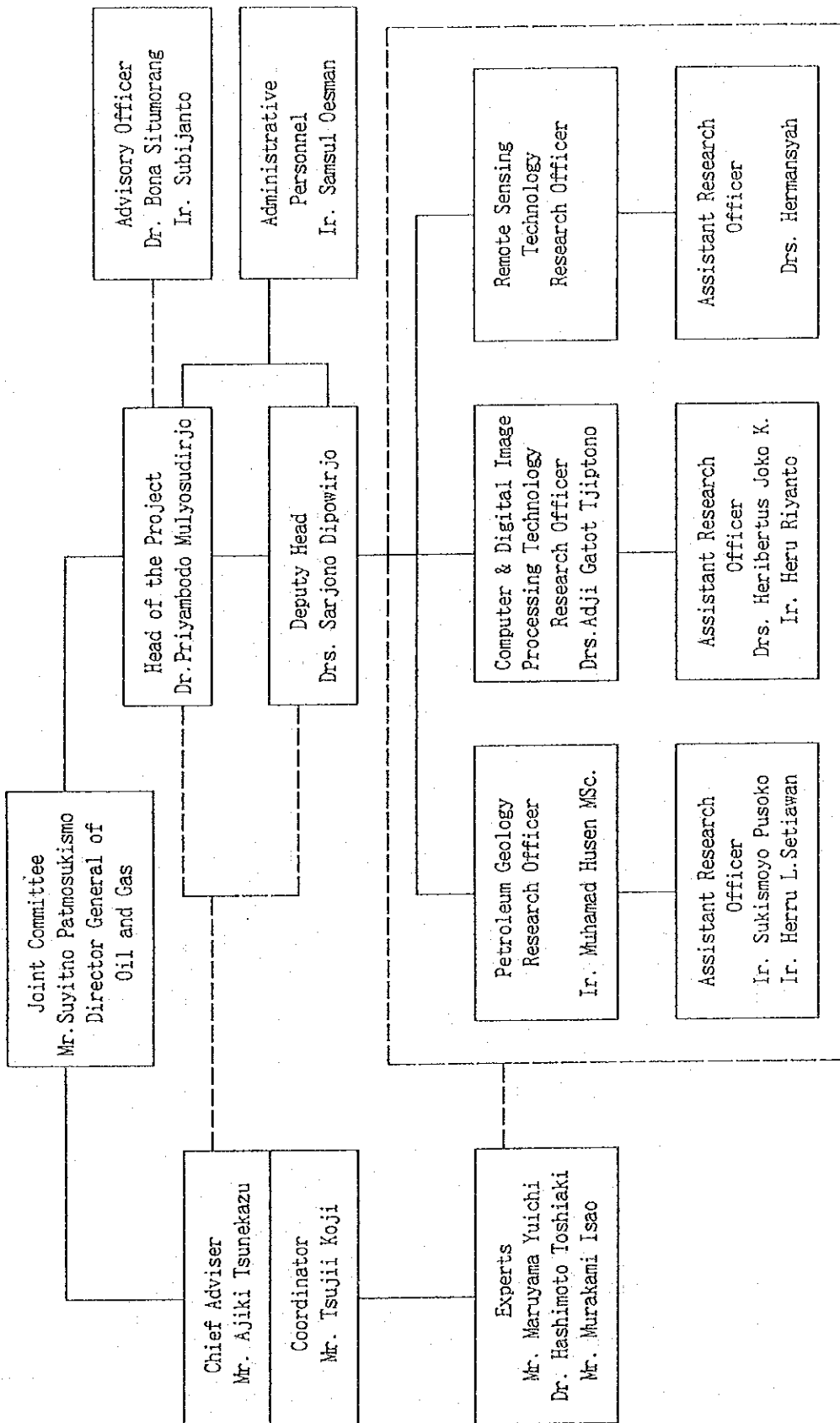
EXPENSES PROVIDED BY THE JAPANESE SIDE

(Unit: Thousand Yen)

JAPANESE FISCAL YEAR	1989	1990	1991	1992	※ 1993	TOTAL
ITEM						
DISPATCH OF MISSIONS		4,208	4,552	3,457	6,992	19,209
DISPATCH OF EXPERTS	3,599	80,067	118,864	103,335	101,974	407,839
TRAINING OF C/P IN JAPAN	9,900		6,300	8,400	4,160	28,760
PROVISION OF MACHINERY & EQUIPMENT		197,725	6,362	8,567	47,157	259,831
TOTAL	13,499	282,000	136,098	123,759	160,283	715,639

※ Tentative

ORGANIZATION CHART OF THE IMPLEMENTATION OF THE PROJECT



Japanese Side

Indonesian Side

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Key

LIST OF COUNTERPART PERSONNEL

NAME	POSITION	FIELD	ASSIGN	TRAINING IN JAPAN	BIRTHDAY
Drs. Sarjono Dipowirjo	Deputy Head of the Project	Geophysical Technical Services	'72/2 ~	91/7/21 ~91/8/3	46/4/16
Ir. Muhamad Husen MSc.	Research Geologist	Petroleum Geology	'83/10 ~	91/5/12 ~91/8/3	57/3/2
Ir. Sukismojo Pusoko	Assistant Research Geologist	Petroleum Geology	'83/1 ~	90/3/28 ~90/6/30	52/7/3
Ir. Herru Lastiadi Setiawan	Assistant Research Geologist	Petroleum Geology	'90/3 ~	92/10/11~92/12/20	62/5/14
Drs. Hermansyah	Assistant Research Geophysicist	Remote Sensing	'90/3 ~	92/10/11~92/12/20	63/11/12
Drs. Donitson Pahala Pasaribu*	Research Geophysicist	Computer & Digital Image Processing	'86/3 ~	90/3/28 ~90/6/30	59/3/10
Drs. Adji Gatot Tjiptono	Assistant Research Geophysicist	Computer & Digital Image Processing	'90/3 ~	91/10/13~91/12/21	62/8/26
Drs. Heribertus Joko Kristadi	Assistant Research Geophysicist	Computer & Digital Image Processing	'90/3 ~	92/10/11~92/12/20	65/3/23
Ir. Heru Riyanto	Assistant Research Geophysicist	Computer & Digital Image Processing	'92/8 ~	94/1/29 ~94/3/26	64/6/26

* He has been studying at the University of Chiba on the programme of Monbusho scholarship from April, 1992.

MACHINERY AND EQUIPMENT PURCHASED BY THE INDONESIAN SIDE

No	Item	Price	
1	Telephones & Automatic Exchanger	Rp.	15,000,000
2	Air Conditioners	Rp.	21,500,000
3	Dehumidifier (W/H 25)	Rp.	5,150,000
4	Personal Computer (Supercom)	Rp.	7,000,000
Total		Rp.	48,650,000

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EXPENSES PROVIDED BY THE INDONESIAN SIDE*In thousand Rupiah*

No	Category	1990	1991	1992	1993	1994 *	Total
1.	Personal Cost	48,000	50,000	55,000	60,000	66,000	279,000
2.	Renovation Cost	30,000	---	25,000	---	---	55,000
3.	Operation Cost :						
	- R/S Data	---	---	4,000	5,000	8,000	17,000
	- Case/Field Study	20,000	30,000	40,000	45,000	50,000	185,000
	- Maintenance Fee	---	---	11,500	23,000	38,000	72,500
	- Material	10,000	10,000	11,000	12,000	15,000	58,000
	- Land/Building	24,000	24,000	24,000	---	---	72,000
	- Utilities	5,000	15,000	17,000	20,000	25,000	82,000
4.	Cost Facilities of Japanese Expert	5,000	3,000	3,000	3,000	2,500	16,500
5.	Others	8,000	15,000	15,000	15,000	15,000	68,000
	TOTAL	150,000	147,000	205,500	183,000	219,500	905,000

* Tentative



15 MINUTES OF DISCUSSIONS

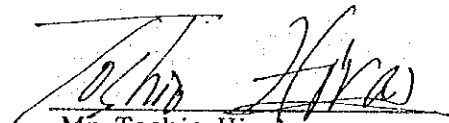
THE MINUTES OF DISCUSSIONS
BETWEEN THE JAPANESE EVALUATION TEAM
AND THE AUTHORITIES CONCERNED OF
THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
ON THE JAPANESE TECHNICAL COOPERATION
FOR THE PROJECT ON
IMAGE PROCESSING TECHNOLOGY FOR OIL AND GAS STUDY

The Japanese Evaluation Team (hereinafter referred to as "the Japanese Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Toshio Hirai, Deputy Director, Planning Division, Mining and Industrial Development Cooperation Department, JICA visited the Republic of Indonesia from 21 March to 29 March 1994, for the purpose of evaluating jointly with the Indonesian Evaluation Team (hereinafter referred to as "the Indonesian Team") the achievement of the Japanese Technical Cooperation for the Project on Image Processing Technology for Oil and Gas Study (hereinafter referred to as "the Project") on the basis of the Record of Discussions signed on 21 August 1989 (hereinafter referred to as "the R/D").

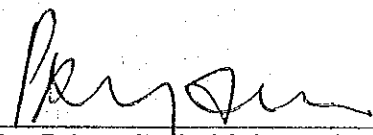
During their stay in the Republic of Indonesia, the Japanese Team discussed with the Indonesian authorities concerned over the matters for the successful implementation of the Project.

As a result of the discussions, the Joint Committee recognized the Joint Evaluation Report summarized by the Evaluation Teams at the Joint Committee Meeting, and both sides mutually agreed upon the matters referred to in the document attached hereto.

Jakarta, March 28, 1994



Mr. Toshio Hirai
Leader,
Japanese Evaluation Team
Japan International
Cooperation Agency,
Japan



Dr. Priyambodo Mulyosudirjo
Director,
Research and Development
Centre for Oil and Gas
Technology "LEMIGAS",
Indonesia

JOINT COMMITTEE MEETING
OF THE PROJECT ON
IMAGE PROCESSING TECHNOLOGY FOR OIL AND GAS STUDY

1. Place, Date and Time

(1) Place : LEMIGAS, Jakarta

(2) Date and Time : Mar. 25, 1994 ; 10:00 - 11:30
13:00 - 14:30

2. Members

(1) Chairman :

Dr. Ir. Priyambodo Mulyosudirjo (Director of LEMIGAS,
Head of the Project)

(2) Indonesian Side :

Dr. Bona Situmorang (Head of Research and Development Div. for
Exploration Technology)

Ir. Subijanto (Head of Research and Development Div. for
Exploitation Technology)

Drs. Sarjono Dipowirjo (Deputy Head of the Project)

Ir. Muhamad Husen (C/P of the Project, Petroleum Geology)

Drs. Adji Gatot Tjiptono (C/P of the Project,
Computer & Digital Image Processing)

Drs. Hermansyah (C/P of the Project, Remote Sensing)

(3) Japanese Side :

(Evaluation Team)

Mr. Hirai Toshio (Team Leader)

Mr. Yabe Hideaki (Technical Cooperation Plan)

Dr. Aoyagi Koichi (Petroleum Geology)

MR. Hayakawa Seihiro (Remote Sensing/Computer & Digital
Image Processing)

Mr. Tsukada Koya (Evaluation Study/Data Readjustment)

Mr. Wada Hisaya (Project Evaluation Management)

(Japanese Experts)

Mr. Ajiki Tsunekazu (Chief Adviser)
Mr. Tsujii Koji (Coordinator)
Mr. Maruyama Yuichi (Petroleum Geology)
Dr. Hashimoto Toshiaki (Remote Sensing)
Mr. Murakami Isao (Computer & Digital Image Processing)

(JICA Indonesia Office)

Miss Yamada Fumiko

3. Agenda

3-1. Recognition of the Joint Evaluation Report

3-2. Review and Plan of the activities of the Project

(1) Review of Current Status and Progress of the Technical Cooperation Program of Fiscal 1993

- a. Technology Transfer Activities
- b. Dispatch of Experts
- c. Provision of Equipment
- d. Training of Counterpart Personnel in JAPAN
- e. Case Study

(2) Exchange of Views on the Draft of Annual Work Plan of Fiscal 1994

- a. Technology Transfer Activities
- b. Dispatch of Experts
- c. Provision of Equipment
- d. Test Study



(3) Exchange of Views on Major Issues concerning the Implementation of the Technical Cooperation

- a. Indonesian Side
- b. Japanese Side

(4) Conclusion

- a. Formulation of the Draft of Annual Work Plan of Fiscal 1994
- b. Confirmation of the Measures to be taken by Both Sides

4. Attached Documents

- (1) Recognition of the Joint Evaluation Report
- (2) Review of Fiscal 1993
- (3) Work Plan of Fiscal 1994

5. Annex

- Annex 1. Joint Evaluation Report
- Annex 2. Joint Evaluation Report ANNEX 4
- Annex 3. Joint Evaluation Report ANNEX 23
- Annex 4. Joint Evaluation Report ANNEX 21
- Annex 5. Accomplishment of Fiscal 1993 and Annual Work Plan of Fiscal 1994
 - 1. Computer & Digital Image Processing
 - 2. Remote Sensing
 - 3. Petroleum Geology
- Annex 6. 1994 LEMIGAS-JICA Seminar
- Annex 7. Case Study and Test Study
 - 1. Case Study in 1993
 - 2. Test Study in 1994
- Annex 8. Annual Work Plan of Fiscal 1994
- Annex 9. List of Requests for the Provision of Machinery and Equipment

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THE ATTACHED DOCUMENT

1. Recognition of the Joint Evaluation Report

The Joint Committee recognized the Joint Evaluation Report submitted by both Evaluation Teams (ANNEX 1).

2. Review of Fiscal 1993

1) General Review

The Project started on August 21, 1989 as a five-year Project, and is now in the fifth year of implementation based on the Work Plan signed on April 12, 1993 in the fields of:

- (1) Computer Technology and Digital Image Processing
- (2) Remote Sensing Technology
- (3) Petroleum Geology

Regarding the Project activities in Fiscal 1993, the Japan International Cooperation Agency (hereinafter referred to as "JICA") has dispatched five long-term experts and six short-term experts to the Research and Development Center for Oil and Gas Technology "LEMIGAS" (hereinafter referred to as "LEMIGAS"), has received three counterpart personnel in Japan and has taken suitable measures to provide the equipment necessary for the Project shown in ANNEX 2.

LEMIGAS has ensured the budgetary allocation as shown in ANNEX 3, and the assignment of Indonesian counterpart personnel as shown in ANNEX 4 necessary for the smooth implementation of the Project.

2) Technical Review

(a) Computer and Digital Image Processing (ANNEX 5-1)

- a. Technical transfer in the area of the operation of the computer and the peripherals has been carried out.
- b. Concerning some actions for machine troubles, it is recognized that counterpart personnel exerted themselves to solve them.

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c. Technical transfer in the area of the regular management and maintenance has been carried out.

d. It is recognized that efforts have been successfully conducted and some counterpart personnel are in good position to prepare a program. Programming on main processing like band ratio, HSI conversion, etc. has been carried out.

e. It is recommended that counterpart personnel will prepare the instructions and some documents of programs by the end of this project.

f. In the case study of the East Java area, counterpart personnel prepared some images of special processing like principal component analysis, Band ratio, HSI conversion, etc. Counterpart personnel have acquired the ability to prepare images. Counterpart personnel in the computer field should study image interpretation (ANNEX 7-1).

g. Maintenance of Image Processing System

The equipment has been maintained in good condition. The contract of the computer maintenance between LEMIGAS and P.T. ASTRA-GRAPHIA was renewed on November 1, 1993 (November 1, 1993 through August 20, 1994).

(b) Remote Sensing (ANNEX 5-2)

a. The lectures on practical procedure of remote sensing and digital image processing have been carried out. Based on the lectures, counterpart personnel have tried several kinds of image processing during the case study, which helped them to master the remote sensing technology.

b. Counterpart personnel have increased their programming abilities through the case study.

c. A reading circle had been planned. But because of many tasks for the case study, it was not carried out and the plan was changed so that the practices of presentation would be performed using the results of the case study. This plan, however, was also not fulfilled owing to the delay of working report of the case study. This should be carried out in the next fiscal year.

d. Publication of 1994 Calendar and Information Panels.

The Project published 1994 calendars based on the images of East Java, North Sumatra, Central Sumatra and Madura areas and were distributed to the organizations concerned. Several kinds of information panels were prepared for the benefit of visitors to the Image Processing Laboratory.

(c) Petroleum Geology(ANNEX 5-3)

Technical transfer have been carried out according to the Work Plan of Fiscal 1993. Those were executed mainly through the case study in the Cepu-Blora area, eastern part of Central Java, the test study in the Tanjung oil field area, South Kalimantan, and the lecture by short term experts.

a. Application of remote sensing for oil and gas exploration

Lecture and exercises were carried out by the short term expert in November 1993. The role of remote sensing on the oil and gas exploration was explained in detail.

b. Geological interpretation and analysis (ANNEX 7-1)

Geological image interpretation was carried out with the case study of the eastern part of Central Java. Cepu-Blora site, one of the case study area had a large extent : approximately 100km x 80km. LANDSAT TM image was mainly employed and a stereo pair of SPOT images was also applied in the limited area for the geological interpretation. As the results of this study two maps were prepared such as structural and stratigraphical interpretation map, both of them had scale 1:100,000. The same study was done in Pamekasan site, Madura island using a SPOT false color composite image.

During this study, a standard of the symbols for image interpretation was prepared, and the suitable legends for the interpretation map preparation were also discussed.

The geological evolution was studied and the site evaluation for further exploration was tried using the results of interpretation. However, time was not enough to transfer all of the techniques and to discuss how to apply them to the exploration purpose. We need some more exercises and case studies to complete.

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Fundamentals of SAR image interpretation were given by the short term expert in July 1993. It must be useful to the future analysis in a dense forest and always cloudy areas such as Indonesia.

c. Methods of Ground Survey

The following items were mainly given during the case study in the Cepu-Blora site.

(1) Selection of survey route

The most effective routes could be selected by using the information acquired from the preliminary image interpretation.

(2) Plotting the observation points on the image

GPS was applied for this work.

(3) The relationship between spectra and surface features

Soil was sampled to examine the spectral characteristics in the laboratory. Kind of trees and forest structure were observed with reference to PCA (Principal Component Analysis) image.

d. Report Making

The report of the case study was prepared by all of counterpart personnel. The geological cross section and illustration were applied to explain the geological process in the chapter of image analysis. Japanese Experts and counterpart personnel discussed how to make a report simple and easy to understand.

e. Test Study in Kalimantan

The test study was carried out in the Tanjung oil field area, South Kalimantan, in November 1993. Participants were four counterpart personnel, all of the Japanese experts and a short term expert.

The purpose of this study was to make sure if remote sensing is applicable in the tropical rain forest such as Kalimantan island. There are still many geologists who believe that remote sensing is difficult to use in such area because of the dense forest cover and land use. The result, however, shows that remote sensing was useful for the geological analysis. And also it was understood that this technology is very important to acquire a lot of useful information about geology and structure when the subject was set in an extensive area in Kalimantan island.

f. Preparation of Guideline

Contents of Guideline had been discussed and decided with counterpart. Guideline will be prepared for the general geologists as a manual of image interpretation in an area covered by forest and cultivated land. It will be completed under the cooperation with remote sensing group as well.

3. Work Plan for Fiscal 1994

The Japanese side and the Indonesian side have jointly formulated the Work Plan for the period as given in ANNEX 8, after the review of the present status of the Project. With respect to the Work Plan, both sides discussed the following:

1) Dispatch of Japanese Experts

The Japanese side expressed that the five long-term experts (chief adviser, petroleum geology, remote sensing, computer and coordinator) will continue to be dispatched until August 20, 1994.

2) Dispatch of Short-term Experts

The Japanese side expressed that the three short-term experts in the field of Microwave Remote Sensing, Seismic Geology and Equipment Maintenance will be dispatched. All counterpart personnel will be required to attend each expert lecture.

3) Provision of Machinery and Equipment

The Indonesian side requested the Team to provide machinery and equipment related to technology transfer as shown in ANNEX 9.

The Team explained to the Indonesian side that it might be difficult for the Japanese side to accept all the requests because of the Japanese budgetary constraint.

The Indonesian side hoped the Japanese side would give full considerations to their request. The Indonesian side agreed to allocate the budget to cover the handling cost to take delivery of these machinery and equipment.

4) Submission of Application Form

The Team requested the Indonesian side to submit application forms (A1, A4) for Fiscal 1994 to JICA through diplomatic channel by the end of April 1994.

6) Allocation of Local Budget

The Indonesian side expressed that they would allocate budget to cover local costs necessary for the operation and management of the Project through the period of the cooperation, such as personnel cost, operating cost and others.

7) LEMIGAS - JICA Seminar (ANNEX 6)

Both sides agreed to hold LEMIGAS - JICA Seminar on 'Remote Sensing Technology for Oil and Gas Exploration' in June 1994.

8) Test Study (ANNEX 7-2)

Both sides agreed to carry out the Test Study in the North Sumatra area in June 1994.

The Japanese side requested the Indonesian side to prepare the relevant information such as geological maps, etc.

ACCOMPLISHMENT OF FISCAL 1993 AND ANNUAL WORK PLAN OF FISCAL 1994 (COMPUTER AND DIGITAL IMAGE PROCESSING)

ITEMS	FISCAL YEAR		1994											
	MONTH		4	5	6	7	8	9	10	11	12	1	2	3
1. COMPUTER SYSTEM														
1-1 SYSTEM INSTALLATION AND TESTING		Finished												
1-2 OPERATION		Finished												
1-3 MAINTENANCE AND MANAGEMENT														
a) BASIC MANAGEMENT AND REGULAR MAINTENANCE														
b) ADVANCED MANAGEMENT AND MAINTENANCE														
2. DIGITAL IMAGE PROCESSING (JOIN WITH R/S FIELD)														
2-1 PRE-PROCESSING (PROGRAMMING)		Finished												
2-2 MAIN PROCESSING (PROGRAMMING)														
a) BAND RATIO														
b) PCA														
c) HSI-RGB CONVERSION														
d) FFT														
2-4 INPUT AND OUTPUT		Finished												
2-5 ADVANCED IMAGE PROCESSING		Finished												
3. CASE STUDY														
3-1 NORTH SUMATRA AREA		Finished												
3-2 CENTRAL SUMATRA AREA		Finished												
3-3 EAST JAVA AREA														
4. PREPARATION OF DOCUMENT														

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ANNUAL WORK PLAN AND ACCOMPLISHMENT (COMPUTER & DIGITAL IMAGE PROCESSING)

⊙ : finished ⊕ : underway ⊕ : planning

1. COMPUTER SYSTEM

1-1 Micro VAX 3900

- 1) Operation (Invoking/Shutdown. Editor etc.,) ⊙
- 2) Management & maintenance (Regular maintenance) ⊙
- 3) Advanced management & maintenance ⊙
- 4) Run time library for programing ⊙
- 5) Symbolic debugger

1-2 Optronics C-4300 Film Writer

- 1) Summary (H/W & S/W) ⊙
- 2) Operation ⊙
- 3) Gamma Correction (LUT) ⊙
- 4) Maintenance & Management (Regular maintenance) ⊙
- 5) Advanced maintenance & management ⊕
- 6) Quality control & glow tube Replacement ⊙

1-3 IP900 Image Processor with CCD Camera System

- 1) Summary of hardware ⊙
- 2) Summary of software ⊙
- 3) Operation ⊙
- 4) Maintenance & management ⊙

1-4 JX-600 Color Scanner & Picrography 2000 Color Printer

- 1) Operation ⊙
- 2) Management & maintenance (Regular maintenance) ⊙
- 3) Advanced management & maintenance ⊙
- 4) Gamma correction & Quality control for Picrography ⊕

1-5 Application Software

- 1) Basic image processing software (J... S/W) ⊙
- 2) SPIDER subroutine software ⊙
- 3) SPIDER-DZ subroutine software ⊙

1-6 Terra-Mar System

- 1) Operation for MICROIMAGE software ⊙

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2. DIGITAL IMAGE PROCESSING (JOIN WITH R/S GROUP)

2-1 Fortran Language

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2-2 Basic Digital Image Processing

- 1) LIPS commands & basic image processing with IP9000
- 2) Others (Lectured by R/S field)

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2-3 Programing of Basic Image Processing

- 1) Data Conversion (by R/S Field)
- 2) Statistics
- 3) Filtering
- 4) Stretching
- 5) Histogram Equalization
- 6) Band ratio
- 7) HSI conversion
- 8) PCA
- 9) FFT

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2-3 Advanced Image Processing

- 1) Fundamentals of advanced image processing (by R/S field)

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3. CASE STUDY

3-1 North Sumatra Area

- 1) Planning and preparation
- 2) Image processing
- 3) Image output
- 4) Field survey
- 5) Report

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3-2 Central Sumatra Area

- 1) Planning and preparation
- 2) Image processing
- 3) Image output
- 4) Field survey
- 5) Report

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3-3 East Java Area

- 1) Planning and preparation
- 2) Image processing
- 3) Image output
- 4) Field survey
- 5) Report



A handwritten signature or set of initials is located in the bottom right corner of the page. It appears to be written in dark ink and is somewhat stylized.

ACCOMPLISHMENT OF FISCAL 1993 AND ANNUAL WORK PLAN OF FISCAL 1994 (REMOTE SENSING)

WORK PLAN
ACCOMPLISHMENT

ITEMS	1993												1994											
	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1. FUNDAMENTALS OF REMOTE SENSING (CONCEPTS) 1-1 BASIC PRINCIPLES	Finished																							
1-2 DIGITAL IMAGE PROCESSING	Finished																							
1-3 APPLIED R/S																								
1-4 READING CIRCLE (Practice of Presentation)																								
2. IMAGE PROCESSING AND PROGRAMMING (PRACTICE) 2-1 TERRA-MAR	Finished																							
2-2 PRE-PROCESSING	Finished																							
2-3 MAIN PROCESSING a) BAND RATIO b) PCA c) HSI-RGB CONVERSION d) FFI	Finished																							
2-4 INPUT AND OUTPUT	Finished																							
2-5 CLASSIFICATION	Finished																							
3. CASE STUDY																								
3-1 NORTH SUMATRA AREA	Finished																							
3-2 CENTRAL SUMATRA AREA	Finished																							
3-3 EAST JAVA AREA																								
4. PREPARATION OF MANUAL																								

ANNUAL WORK PLAN AND ACCOMPLISHMENT (REMOTE SENSING)

⊙ : finished ⊕ : underway ⊗ : planning

1. FUNDAMENTALS OF REMOTE SENSING (CONCEPTION)

1-1 Basic Principles

- 1) Definition of remote sensing ⊙
- 2) Radiation ⊙
- 3) Electro-magnetic wave ⊙
- 4) Platform ⊙
- 5) Basic flow of R/S data processing ⊙
- 6) Sensor ⊙

1-2 Digital Image Processing

1-2-1 Pre-processing

- 1) Data acquisition ⊙
- 2) Format conversion ⊙
- 3) Radiometric correction ⊙
- 4) Geometric correction ⊙
- 5) Coordinate system and map projection ⊙
- 6) Resampling ⊙

1-2-2 Main Processing

- 1) Image density conversion ⊙
- 2) Spatial filtering ⊙
- 3) Band ratio ⊙
- 4) Principal component analysis ⊙
- 5) Decorrelated stretch ⊙
- 6) HSI-RGB conversion ⊙
- 7) FFT ⊙

1-2-3 Image output

- 1) Color system ⊙
- 2) False color composite ⊙
- 3) Pseudo color image ⊙

1-2-4 Classification

- 1) Multispectral analysis
- 2) Feature extraction
- 3) Classification method
- 4) Parametric supervised classification
- 5) Non-parametric supervised classification
- 6) Unsupervised classification
- 7) Per-field classification
- 8) After-processing in classification

1-3 Applied Remote Sensing

1-3-1 Environmental Application (by short-term expert)

- 1) Water quality
- 2) Vegetation change
- 3) Monitoring of tropical forest
- 4) Land slide
- 5) Temperature measurement by thermal data

1-3-2 Applied measurements (by short-term expert)

- 1) Photogrammetry
- 2) Videogrammetry

1-3-3 Special topics (by short-term expert)

- 1) Microwave remote sensing
- 2) Geographical information system
- 3) Digital Terrain Analysis

1-4 Reading circle

- 1) Proceedings of 1991 ACRS
- 2) Practice of Presentation

2. IMAGE PROCESSING & PROGRAMMING (PRACTICE)

2-1 Terra-Mar

- 1) Basic operation on Terra-Mar (by short-term expert)
- 2) Processing and output

2-2 Pre-processing

- 1) Format conversion
- 2) Basic statistics processing

- 3) Geometric correction (with Terra-Mar) ○
- 4) Resampling (with Terra-Mar) ○

- 2-3 Main Processing ○
 - 1) Image density conversion ○
 - 2) Spatial filtering ○
 - 3) Band ratio ○
 - 4) Principal component analysis ○
 - 5) Decorrelated stretch ○
 - 6) HSI-RGB conversion ○
 - 7) FFT ○

- 2-4 Input and Output ○
 - 1) Scanner ○
 - 2) Pictography ○
 - 3) Optronics ○

- 2-5 Classification (with Terra-Mar) ○
 - 1) Parametric supervised classification ○
 - 2) After-processing in classification ○

- 3. CASE STUDY

- 3-1 North Sumatra Area ○
 - 1) Planning and preparation ○
 - 2) Image processing ○
 - 3) Image output ○
 - 4) Field survey ○
 - 5) Report ○

- 3-2 Central Sumatra Area ○
 - 1) Planning and preparation ○
 - 2) Image processing ○
 - 3) Image output ○
 - 4) Field survey ○
 - 5) Report ○

- 3-3 East Java Area ○
 - 1) Planning and preparation ○
 - 2) Image processing ○

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3) Image output

4) Field survey

5) Report

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4. Manual of Remote Sensing

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ACCOMPLISHMENT OF FISCAL 1993 AND ANNUAL WORK PLAN OF FISCAL 1994 (PETROLEUM GEOLOGY)

WORK PLAN
ACCOMPLISHMENT

ITEMS	FISCAL YEAR MONTH	1993												1994												
		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1. FUNDAMENTALS OF PETROLEUM GEOLOGY 1-1 SEDIMENTARY GEOLOGY 1-2 SUBSURFACE GEOLOGY 1-3 OIL/GAS FIELD 1-4 FORMATION EVALUATION 1-5 AIRPHOTO GEOLOGY & ANALOG-PROCESSING IN INDONESIA (BY LEMIGAS)	Finished																									
	Finished																									
	Finished																									
	=====																									
	Finished																									
2. APPLICATION OF REMOTE SENSING GEOLOGY 2-1 R/S GEOLOGY 2-2 INTERPRETATION 2-3 PREPARING GEOLOGICAL MAPS 2-4 R/S AND EXPLORATION	=====																									
	=====																									
	=====																									
	=====																									
3. CASE STUDY 3-1 FIELD CHECK (GROUND TRUTH)	=====																									
	=====																									
4. PREPARATION OF A GUIDELINE	=====																									

ANNUAL WORK PLAN AND ACCOMPLISHMENT (PETROLEUM GEOLOGY)

⊙ : finished ⊕ : underway ⊗ : planning

1. FUNDAMENTALS OF PETROLEUM GEOLOGY

1-1 Sedimentary Geology (by short-term expert)

- 1) Origin of sedimentary rocks ⊙
- 2) Lithification and diagenesis in sediments ⊙

1-2 Subsurface Geology (by short and long-term experts)

- 1) Technical terms of petroleum geology ⊙
- 2) Lithological classification ⊙
- 3) The relation of surface, subsurface and R/S geology ⊙
- 4) Oil/gas field (structure, quality of source rock, reservoir rock and cap rock) ⊙
- 5) Type of source rock ⊙
- 6) Outline of petroleum exploration method ⊙
 - Gravity survey, magnetic survey and seismic survey
 - Field/surface geological survey, airphoto geology and R/S geology
- 7) Drainage mechanism of oil accumulation ⊙
- 8) Estimation example of oil accumulation ⊙
- 9) Simulation model for petroleum exploration ⊙
 - Fundamentals of geochemistry
 - Generation modeling
 - Fluid flow modeling
 - 1-D expulsion model - Application of BSS-JPX
 - Importance of input geochemical parameters
 - 2-D fluid flow model - GEOPET II
 - Importance of reservoir geometry
 - Review of models and future potential of simulation modeling

1-3 Oil/Gas Field Example (by short-term experts)

- 1) Outline of general geology ⊙
- 2) Petroleum geology ⊙
 - Size, thickness of sediments and rock facies in the sedimentary basin
 - Source rock - geochemical evaluation, pyro-analysis

gross plot in the sedimentary basin

Maturity - the maturation window of crude oil vitrinite
reflectance (Ro) the thermal geohistory

Timing of oil generation, migration and accumulation

Hopeful exploration plays in the petroleum contract area

- 3) Structural evaluation ○
Criteria for the evaluation - evaluation example
- 4) Promising structures for wildcats ○
Main well data of Indonesia
Main oil/gas field data of Indonesia
- 5) Estimation of oil reserves ○
Oil in place, recoverable oil reserves
Volumetric method for oil reserves
- 6) Exploration and development work program ○
Exploration plan
Development and production plan
- 7) The evaluation of drilling result ○
Wildcat and appraisal wells
- 8) Model for sedimentary environment by using drilling data ○
- 9) Decision making process ○
(from oil exploration to production stage)

1-4 Formation Evaluation

- 1) Fundamentals of quantitative log interpretation ○
- 2) The spontaneous potential (SP) curve ○
- 3) Conventional resistivity logs ○
- 4) Focusing electrode logs ○
- 5) Induction logging ○
- 6) Microresistivity devices ○
- 7) The sonic log ○
- 8) The formation density log ○
- 9) Neutron logs ○
- 10) The gamma ray log ○
- 11) Determination of lithology and porosity ○
- 12) Determination of R_w ○
- 13) Resistivity interpretation ○
- 14) Determination of R_o ○
- 15) Determination of saturation (Clean formation) ○
- 16) Determination of saturation (Shaly formation) ○
- 17) Special purpose devices and services ○

18) Exercise : Basic course

Borehole correction for DLL & RMSFL
Rt determination by DLL & RXO
Quick look method (Clean formation)
Lithology determination
Rw determination
Quick look methods by overlay
 Logarithmic resistivity overlay
 Density - Neutron overlay
FDC - Derived porosity
Neutron - Derived porosity
Sonic - Derived porosity

19) Exercise : Advanced course

Quick look method
Lithology and porosity evaluation
Rw computation
Shaly sand interpretation
 Preinterpretation (Quick look)
 Clay determination
 Hydrocarbon correction
 Rw determination
 Sw computation

20) Other application

Estimation of formation pressure
Well correlation
Structure analysis by using dipmeter data.

2. APPLICATION OF REMOTE SENSING GEOLOGY

2-1 R/S Geology (by short-term experts)

1) Photogeology and remote sensing

Interpretation process
General flow of the photogeological works
Characteristics of information by photo interpretation
Criteria for photo interpretation
Interpretation of drainage features
Interpretation of geological structures
Interpretation of rock types
Expression of interpreted information
Usefulness and limitation of photo interpretation

- 2) Application of R/S geology for oil and gas exploration
 - Tarim basin in China
 - Oil field in Myanmar

- 2-2 Interpretation (by short and long-term experts)
 - 1) North Sumatra
 - 2) Central Sumatra
 - 3) East Java
 - 4) Exercise of SAR Image Interpretation

- 2-3 Preparation of Geological Interpretation Maps
 - (by short and long-term experts)
 - 1) North Sumatra
 - 2) Central Sumatra
 - 3) East Java

- 3. PRACTICAL ANALYSIS OF FIELD R/S GEOLOGY
 - 3-1 1st Case Study in North Sumatra
 - 1) Preliminary map preparation
 - 2) Field check/survey
 - 3) Evaluation of the image interpretation
 - 4) Geological interpretation
 - 5) Final report making

 - 3-2 2nd Case Study in Central Sumatra
 - 1) Preliminary map preparation
 - 2) Field check/survey
 - 3) Evaluation of the image interpretation
 - 4) Geological interpretation
 - 5) Final report making

 - 3-3 3rd Case Study in East Jawa
 - 1) Preliminary map preparation
 - 2) Field check/survey
 - 3) Evaluation of the image interpretation
 - 4) Geological interpretation
 - 5) Final report making

3/11/13

1994 LEMIGAS-JICA SEMINAR

1. Theme : Remote Sensing Technology for Oil and Gas Exploration
2. Date/Time : June 15 , 1994
3. Place : LEMIGAS
4. Attendants : 100 persons
5. Program

I. Registration 08:00-09:00

. Opening Ceremony 09:00-09:30

Report by LEMIGAS

Opening address by Representative of JICA Jakarta Office
by Director General of Oil and Gas

. Poster Session 09:30-10:00

< Coffee Break >

. Session 1. 10:00-11:00

Presentation by 3 Counterpart Personnel

. Session 2. 11:00-12:00

Lecture by 3 Speakers from outside

. Closing Ceremony 12:00-12:10

Closing address by Director of LEMIGAS

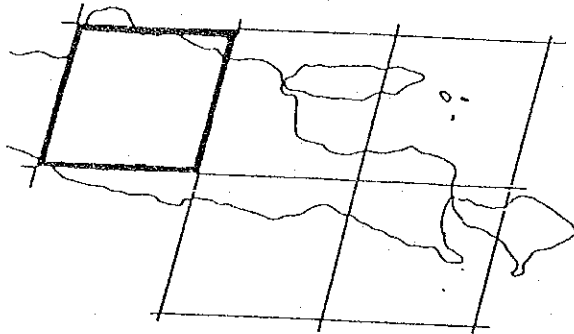
< Lunch >

6. Budget : Rp.18,570,000

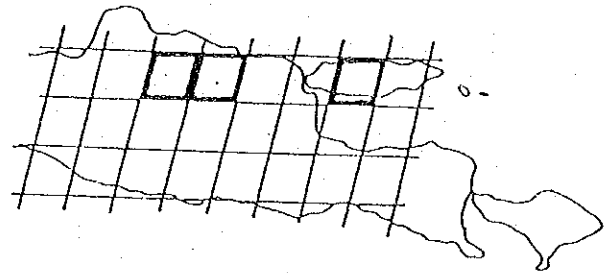
CASE STUDY IN 1993

(1) Area and Data

1) Landsat-5 TM	24, Aug., 1991	path/row	=119/65
2) SPOT HRV(XS)	29, July, 1988	GRS(K/J)	=294/364
3) SPOT HRV(XS)	30, July, 1988	GRS(K/J)	=295/364
4) SPOT HRV(PA)	15, July, 1990	GRS(K/J)	=295/364
5) SPOT HRV(XS)	27, Oct., 1988	GRS(K/J)	=298/364



Coverage map of TM



Coverage map of SPOT

(2) Image Processing

- a. Precise geometric correction : 1) - 4)
- b. False color images : all images
- c. HSI modification : 1)
- d. Principal component analysis : 1)
- e. Band ratio images : 1)
- f. Image output : all processed data (a.- e.)

(3) Schedule of the work

	3	4	5	6	7	8	9	10	11	12	1	2	3
Preparation & Planning	xxxxxxx												
Acquisition of CCT data	xxxxxx												
Processing	xxxxxxxxxxxxxxxxxxx												
Interpretation	xxxxxxxx												
Re-processing	xxx												
Re-interpretation	xxxxxxxxxxxxxxxxxxx												
Field check*	xx												
Report	xxxxxxxxxxxxxxxxxxx												

* Field check : all members Aug.31 - Sep. 6
 : all C/P & geology Expert Aug.31 - Sep.10

— : planned
 xxxxx : performed

TEST STUDY IN 1994

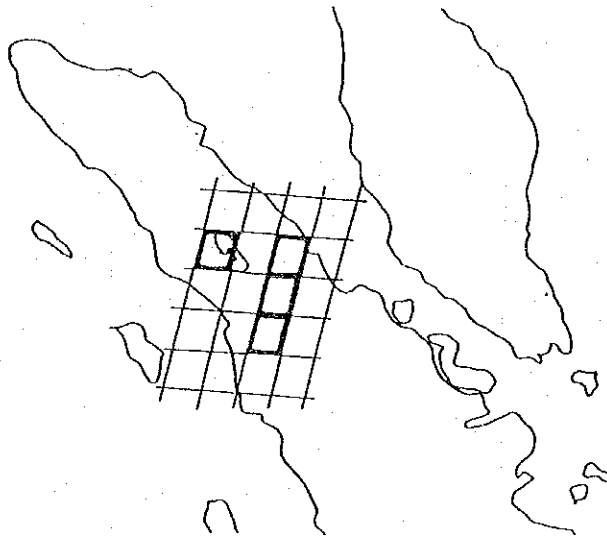
(1) Purpose and method

The main purpose of this study is to evaluate the SAR image quality for the geological analysis. It will be interpreted during the lectures and exercises by the short term expert. The result of it is examined in the field. This area was studied as the case study in 1991 using MSS data. Those results must be applied to compare the difference of the image quality.

(2) Area and Data

1) JERS-1 SAR	15, Dec., 1992	path/row = 124/296
2) JERS-1 SAR	15, Dec., 1992	path/row = 124/297
3) JERS-1 SAR	15, Dec., 1992	path/row = 124/298
4) JERS-1 SAR	24, Jun., 1992	path/row = 126/296

Reference : Landsat MSS (used in the case study in 1991)



Coverage map of JERS-1 SAR

(3) Schedule of the work

	1	2	3	4	5	6	7
Preparation & Planning							
Acquisition of CCT data							
Processing*(in Japan)							
Lecture**(by S/T expert)							
Field check							
Report							

* : to be carried out in G.S.J.(MITI)

** : concerning to processing, interpretation, etc.

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ANNUAL WORK PLAN OF FISCAL 1994

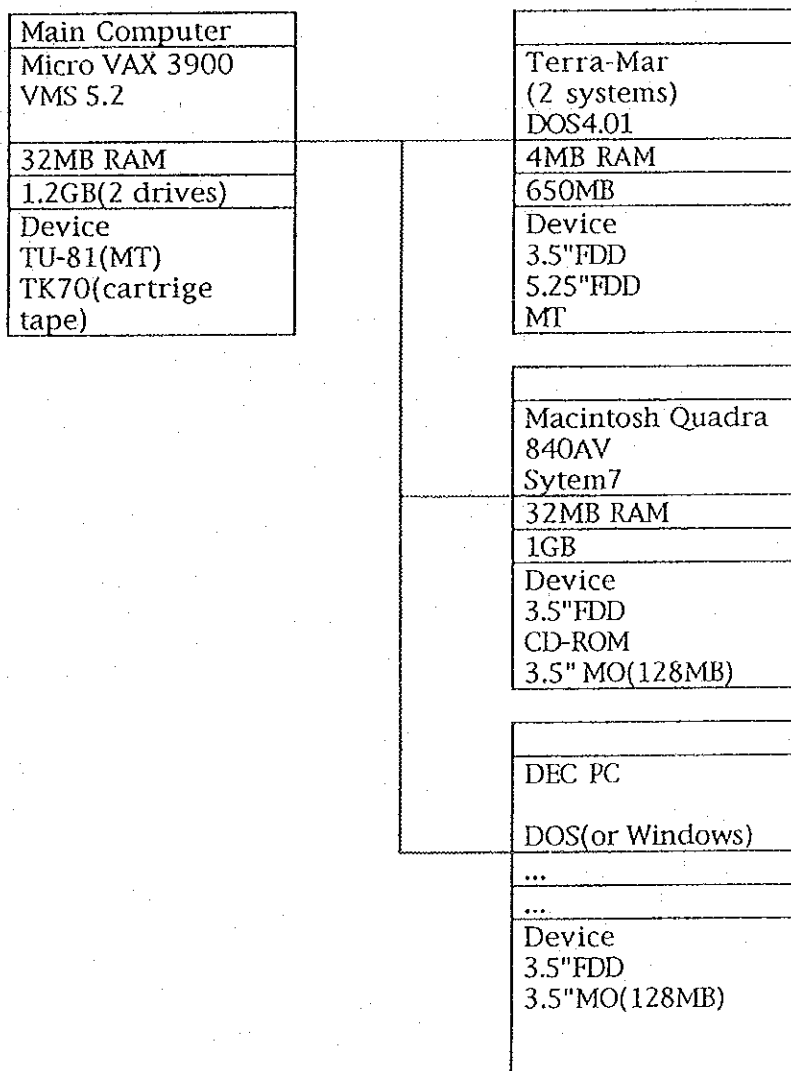
		1994							1995				
		4	5	6	7	8	9	10	11	12	1	2	3
PROGRAM	1) Lecture 2) Case Study 3) Field Check 4) Seminar												
MISSION													
EXPERTS	Long Term Experts 1) Ajiki Tsunekazu (Chief Adviser) 2) Tsujii Koji (Coordinator) 3) Murakami Isao (Computer Programming) 4) Hashimoto Toshiaki (Remote Sensing) 5) Maruyama Yuichi (Petroleum Geology)												
	Short Term Experts 1) (Seismic Geology) 2) (Microwave Remote Sensing) 3) (Equipment Maintenance)												
TRAINING IN JAPAN													
PROVISION OF EQUIPMENT	1) Pictography 3000 2) Network Software & P/C with MO Drive												

NOTE : This Schedule is subject to conditions that budget and other arrangements will be prepared for the implementation of the Project.
This scope of technical cooperation is subject to change within the scope of the provisions given in the Record of Discussion.
Other short term experts will be dispatched in case of need during the period of the Project.

LIST OF REQUESTS FOR THE PROVISION OF MACHINERY AND EQUIPMENT

Request No.	Machinery/Equipment Name	Quantity	Priority
1	FUJIX PICTROGRAPHY 3000 PICTROGRAPHY 3000(GP-IB) IRIS driver software Driver software for Macintosh	1 1 1	A
2 (*1)	Network software for VAX system	1 Set	A
3 (*1)	Personal Computer with MO drive	1 Set	A

(*1) Image Processing Laboratory Computer System



THE RECORD OF DISCUSSIONS
BETWEEN THE JAPANESE IMPLEMENTATION SURVEY TEAM
AND THE AUTHORITIES CONCERNED OF
THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
ON THE JAPANESE TECHNICAL COOPERATION
FOR THE PROJECT ON
IMAGE PROCESSING TECHNOLOGY FOR OIL AND GAS STUDY

The Japanese Implementation Survey Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Muneshige Yamazaki, visited the Republic of Indonesia from August 14 to August 21 for the purpose of working out the details of the technical cooperation program concerning the Project on Image Processing Technology for Oil and Gas Study in the Republic of Indonesia.

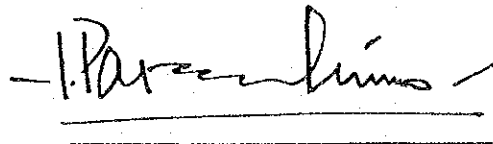
During its stay in the Republic of Indonesia, the Team exchanged views and had a series of discussions with the Indonesian authorities concerned in respect of the desirable measures to be taken by both Governments for the successful implementation of the above-mentioned project.

As a result of the discussions, both parties agreed to recommend to their respective Governments the matters referred to in the document attached hereto.

Jakarta, August 21, 1989



Mr. MUNESHIGE YAMAZAKI
Leader,
Implementation Survey Team,
Japan International
Cooperation Agency,
Japan



Mr. SUYITNO PATMOSUKISMO
Director General,
Directorate General of
Oil and Gas,
Department of Mines
and Energy

THE ATTACHED DOCUMENT

I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of Japan and the Government of the Republic of Indonesia will cooperate with each other in implementing the Project on Image Processing Technology for Oil and Gas Study (hereinafter referred to as "the Project") for the purpose of transferring appropriate technology in the field of the image processing technology for oil and gas and thus contributing to the effective exploration of oil and gas in the Republic of Indonesia.
2. The Project will be implemented in accordance with the Master Plan which is given in Annex I.

II. DISPATCH OF JAPANESE EXPERTS

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide at its own expense services of the Japanese experts as listed in Annex II through the normal procedures under the Colombo Plan Technical Cooperation Scheme.
2. The Japanese experts referred to in 1 above and their families will be granted in the Republic of Indonesia the privileges, exemptions and benefits no less favourable than those accorded to experts of third countries working in the Republic of Indonesia under the Colombo Plan Technical Cooperation Scheme and will include the following:
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- (1) Exemption from income tax and charges of any kind imposed on or in connection with the living allowances remitted from abroad in relation to the implementation of the Project;
- (2) Exemption from import and export duties and any other charges imposed in respect of personal and household effects which may be brought into from abroad or taken out of the Republic of Indonesia;
- (3) Exemption from import tax, import sales tax, sales tax and other taxes and charges of any kind imposed on or in connection with the purchase in the Republic of Indonesia by the Japanese experts of one motor vehicle per expert;
- (4) Free local medical services and facilities to the Japanese experts and their families.

III. PROVISION OF MACHINERY AND EQUIPMENT

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide at its own expense such machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project as listed in Annex III, through the normal procedures under the Colombo Plan Technical Cooperation Scheme.
2. The Equipment will become the property of the Government of the Republic of Indonesia upon being delivered C.I.F. to the Indonesian authorities concerned at the ports and/or airports of disembarkation, and will be utilized properly and exclusively for the implementation of the Project in consultation with the Japanese experts referred to in Annex II.

IV. TRAINING OF INDONESIAN PERSONNEL IN JAPAN

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to receive at its own expense the Indonesian personnel connected with the Project for technical training in Japan through the normal procedures under the Colombo Plan Technical Cooperation Scheme.
2. The Government of the Republic of Indonesia will take necessary measures to ensure that the knowledge and experience acquired by the Indonesian personnel from technical training in Japan will be utilized effectively for the implementation of the Project.

V. SERVICES OF INDONESIAN COUNTERPART AND ADMINISTRATIVE PERSONNEL

1. In accordance with the laws and regulations in force in the Republic of Indonesia, the Government of the Republic of Indonesia will take necessary measures to secure at its own expense the necessary services of Indonesian counterpart and administrative personnel as listed in Annex IV.
2. The Government of the Republic of Indonesia will allocate the necessary number of suitably qualified personnel corresponding to each Japanese expert to be dispatched by the Government of Japan as specified in Annex II for the effective and successful transfer of technology under the Project.

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VI. MEASURES TO BE TAKEN BY THE GOVERNMENT OF THE REPUBLIC OF INDONESIA

1. In accordance with the laws and regulations in force in the Republic of Indonesia, the Government of the Republic of Indonesia will take necessary measures to provide at its own expense:
 - (1) Land, buildings and facilities as listed in Annex V;
 - (2) Supply or replacement of machinery, equipment, instrument, vehicles, tools, spare parts, and any other materials including remote sensing preprocessed data necessary for the implementation of the Project other than those provided through JICA under III above;
 - (3) Transportation facilities and travel allowance for the official travel of Japanese experts within the Republic of Indonesia;
 - (4) Suitably furnished accommodations for the Japanese experts and their families.

2. In accordance with the laws and regulations in force in the Republic of Indonesia, the Government of the Republic of Indonesia will take necessary measures to meet:
 - (1) Expenses necessary for the transportation of the Equipment within the Republic of Indonesia as well as for the installation, operation and maintenance thereof;
 - (2) Customs duties, internal taxes and any other charges, imposed on the Equipment in the Republic of Indonesia;
 - (3) All running expenses necessary for the implementation of the Project.

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VII. ADMINISTRATION OF THE PROJECT

1. The Director General, Directorate General of Oil and Gas, Department of Mines and Energy, will bear overall responsibility for the implementation of the Project.
2. The Director of the Research and Development Center for Oil and Gas Technology "LEMIGAS" (hereinafter referred to as "LEMIGAS"), as the Head of the Project, will be responsible for the administrative, managerial and technical matters of the Project.
3. The Japanese Chief Advisor will provide necessary recommendation and advice on technical and administrative matters concerning the implementation of the Project to the Head of the Project.
4. The Japanese experts will give necessary technical guidance and advice to the Indonesian counterpart personnel on matters pertaining to the implementation of the Project.
5. For the effective and successful implementation of the Project, a Joint Committee will be established with the function and composition as referred to in Annex VI.
6. The Organization Chart for the implementation of the Project is shown in AnnexVII.
7. The Project will be implemented in close collaboration with the Center for Data Processing and Mapping, Department of Public Works.

VIII. CLAIMS AGAINST JAPANESE EXPERTS

The Government of the Republic of Indonesia undertakes to bear claims, if any arises, against the Japanese experts engaged in the Project resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in the Republic of Indonesia except

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for those arising from the willful misconduct or gross negligence of the Japanese experts.

IX. MUTUAL CONSULTATION

There will be mutual consultation between the two Governments on any major issues arising from, or in connection with this Attached Document.

X. TERM OF COOPERATION

The duration of the technical cooperation for the Project under this Attached Document will be five (5) years from the date of the signing of this Record of Discussions.

However, there will be a general review by the Joint Committee on the progress of the implementation of the Project in due time during the cooperation period in order to assess whether the term of cooperation should be modified for the successful implementation of the Project.

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ANNEX I . MASTER PLAN

1. Objectives of the Project

Objectives of the Project are to facilitate the research and development in image processing technology and to apply them to the method of the exploration of oil and gas in the Republic of Indonesia.

2. Objectives of the Japanese Technical Cooperation

Objectives of the Japanese Technical Cooperation during the term of the cooperation are to transfer appropriate technology to the Indonesian counterpart personnel as listed in Annex IV so as to enable them to carry out the activities of the Project.

3. Scope of the Project

The appropriate technology transfer to the Indonesian counterpart personnel will be done in the following fields;

- 1) Computer technology / Image Processing
- 2) Remote Sensing (R/S)
- 3) Application Method of R/S to Petroleum Exploration

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ANNEX II. JAPANESE EXPERTS

Fields of the Japanese experts are as follows:

1. Chief Advisor
2. Experts in the field of;
 - (1) Computer Technology / Digital Image Processing
 - (2) Remote Sensing Technology
 - (3) Petroleum Geology

Note: Short-term experts may be dispatched, if necessity arises, and mutually agreed upon, for the smooth implementation of the Project.

ANNEX III. LIST OF EQUIPMENT

1. Equipment for Computer Technology / Digital Image Processing
2. Other necessary equipment and materials to be mutually agreed upon for the effective implementation of the Project.

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ANNEX IV. LIST OF INDONESIAN COUNTERPART AND ADMINISTRATIVE PERSONNEL

1. Head of the Project (Director of LEMIGAS, Department of Mines and Energy)
2. Deputy head of the Project
3. Counterpart personnel in the field of ;
 - (1) Computer Technology / Digital Image Processing
 - (2) Remote Sensing Technology
 - (3) Petroleum Geology
 - (4) Other fields concerned with the Project mutually agreed upon as necessary
4. Administrative Personnel
 - (1) Administrative Officers
 - (2) Typists
 - (3) Other necessary officers
5. Other necessary personnel mutually agreed upon :

ANNEX V. LAND, BUILDINGS AND FACILITIES

1. Land, buildings and facilities for the Project
2. Rooms and space necessary for the installation and storage of machinery, equipment and materials provided by the Government of Japan
- 2f-87 3. Office space and necessary facilities for the Japanese experts
4. Other facilities mutually agreed upon as necessary

ANNEX VI. JOINT COMMITTEE

1. Functions

The Joint Committee will meet at least once a year and whenever necessity arises, and work:

- (1) To formulate the Annual Work Plan of the Project in line with the Tentative Schedule of Implementation formulated under the framework of this Record of Discussions;
- (2) To review the overall progress of the Technical Cooperation Program as well as the achievements of the above-mentioned Annual Work Plan;
- (3) To review and exchange views on major issues arising from or in connection with the Technical Cooperation Program.

2. Composition

- (1) Chairman ; Director General, Directorate General of Oil and Gas, Department of Mines and Energy

- (2) Members

- a. Indonesian Side

- 1) Director of LEMIGAS
 - 2) Personnel concerned with the Project designated by the Chairman

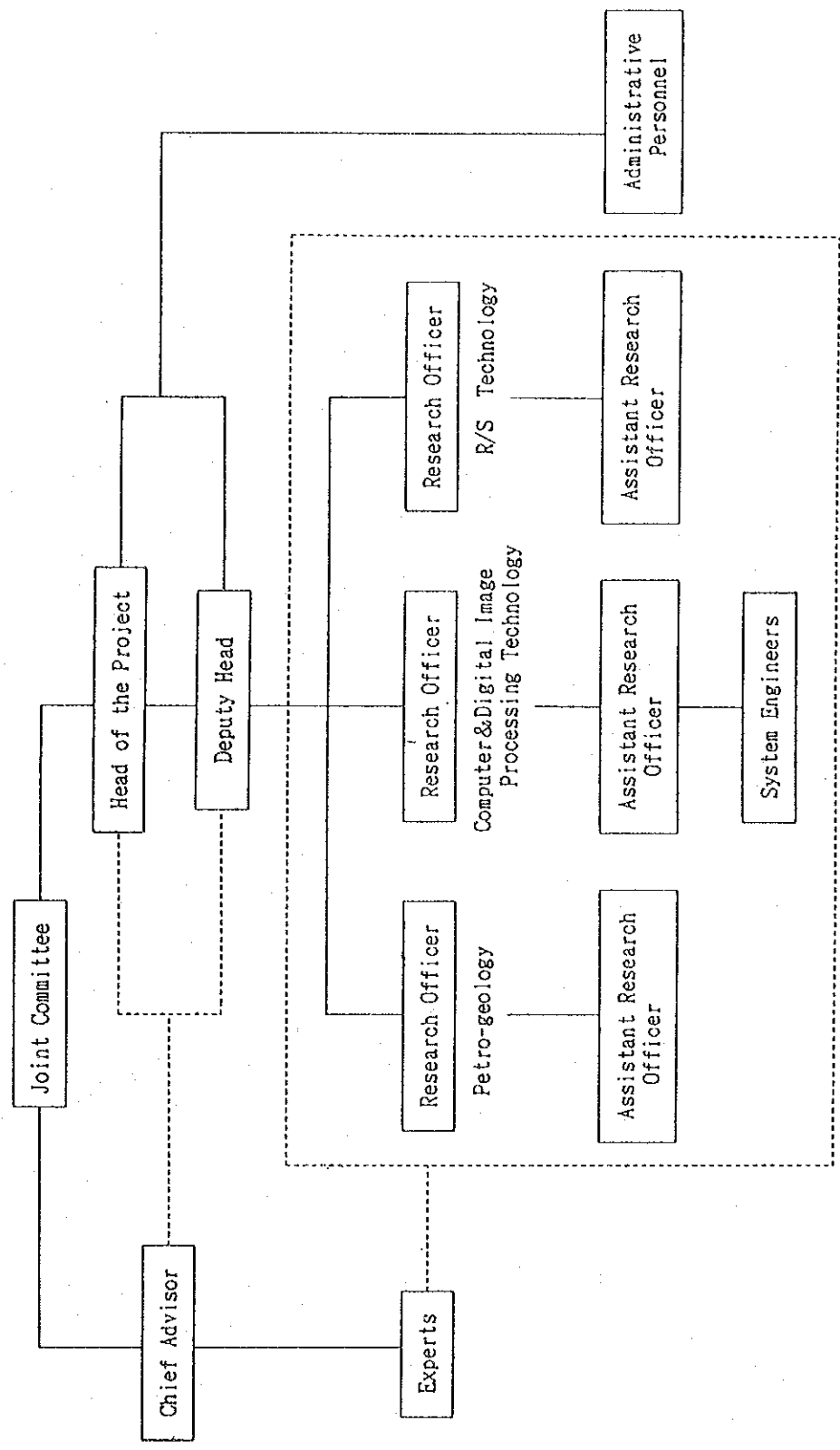
- b. Japanese Side

- 1) Chief Advisor
 - 2) The Japanese experts designated by the Chief Advisor
 - 3) Representatives of JICA Indonesia office
 - 4) Personnel concerned with the Project to be dispatched by JICA, if necessary

Note: Officials of the Embassy of Japan may attend the Joint Committee as observers.

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ANNEX VII. ORGANIZATION CHART FOR THE IMPLEMENTATION OF THE PROJECT



Japanese Side

Indonesian Side

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JICA