A Survey Report on The Petroleum Exploration and Production Data Bank System Development Project in The Republic of Indonesia

August 1979

Japan International Cooperation Agency

A SURVEY REPORT ON THE PETROLEUM EXPLORATION AND PRODUCTION DATA BANK SYSTEM DEVELOPMENT PROJECT IN THE REPUBLIC OF INDONESIA

AUGUST 1979

JAPAN INTERNATIONAL
COOPERATION AGENCY

PREFACE

The Government of Japan, in response to a request of the Government of the Republic of Indonesia, agreed to conduct a survey on the "Petroleum Exploration and Production Data Bank System Development Project" and entrusted Japan International Cooperation Agency(JICA)to carry out the survey.

JICA, recognizing the importance of this project for the economic and social development of Indonesia, dispatched to Indonesia a survey team headed by Mr.Daishiro Kasahara (Japan Oil Engineering Co.)for a period from November 20 through December 24,1978.

The team conducted a survey on the petroleum exploration and production data bank system development project and has now formulated this report.

I hope this report will be useful for planning a data bank system of oil exploration and production as well as for the promotion of economic interchange and friendly relations between our two countries.

I wish to express my sincere thanks to those officials concerned of the Republic of Indonesia for their kind cooperation extended to the team.

August 1979

Shinsaku HOGEN
President
Japan International Cooperation Agency

CONTENTS

LIST OF EXHIBIT

LIST OF ANNEX

Chapter 1 INTRODUCTION

1-1 Background of the Survey

In May, 1977 Mr. Piet Haryono, President director of PERTAMINA, The Indonesian State Oil and Gas Mining Enterprise, requested the Japanese government through Japanese Embassy in Indonesia for technical cooperation concerning energy data bank system. Indonesian government was planning to build energy data bank system to effectively collect, process and retrieve information about oil and other energy resources and wanted Japan to cooperate.

Japanese government, in turn, asked PERTAMINA to disclose more details of the proposed system. Mr. Trisulo, Director of Exploration and Production, indicated the following two points as concrete content of the data bank system in his reply in November, 1977.

(1) To set up data bank system concerning energy supply-demand
(2) To set up data bank system concerning energy resource exploration and development.

Japanese government, although basically prepared to accept the request, felt it necessary to ascertain the Indonesian policy and detailed requirement since there still were such ambiguous points as to what extent existing data had been processed or collected as well as basic policy and preparation on their side. In order to confirm these points, a team of experts was dispatched to Indonesia to conduct preliminary survey from February 28 to March 12 of 1978. The preliminary survey was conducted on the following subjects.

(1) The basic attitude on the side of Indonesia toward the project.
(2) To grasp Indonesian needs for the project and present conditions.
(3) To propose corresponding measures on Japanese side based upon present Indonesian needs and situation.

The preliminary survey team summed up their findings which were divided into two parts, the former concerning energy supply-demand data bank system and the latter petroleum exploration and development data bank system. As to petroleum exploration and production data bank system, they conceptualized the scope of work for the first stage development of the project as itemized in the followings, even with comments that these items would be refined in detail and the subsequent mission would discuss the scope of work with the Indonesian side.

(1) Since almost all pertinent data originate from the PERTAMINA Unit offices, the first stage of preparing the data bank system is initiated in the PERTAMINA Unit base. The data bank system in the Unit office is to be designed mainly so as to meet with the requirements of the Unit operational work.

(2) The minimization of routine report making work and data storing space is required for the system. The standardization of automatic recording forms is also pursued in the system. The currently applied data filing system and the application softwares are also built in the new system as a part of them.

(3) The system is also to be designed in the manner of integrating the separate satellite module for the data bank system of each organization. The system is conceived on the concept of local fabrication of raw data in each system. The system design includes the recommendation of introduction of inter-office off-line and/or on-line unit as its long term target.

Indonesian side put this project on the list of international cooperation request (IGGI list) of BAPPENAS formally and, at the same time, specified the content of the request by classifying it into two parts, namely, energy supply-demand data bank system and petroleum exploration and production data bank system. A formal request for cooperation in written form was submitted to Japanese government from Technical Coordination Committee in President's Office.

Japanese government, responding to the formal request from Indonesian government, studied the result of the preliminary study and entrusted the Agency (JICA) to carry out the subsequent survey on the petroleum exploration and development project according to the findings of the preliminary survey.

Accordingly, the Agency set up specific project called "The Petroleum Exploration and Development Data Bank System Development Project" (The Data Bank System Development Project) survey method, schedule, conducted the field survey from November 20 to December 25 of 1978 and performed study on the survey results after their returning to Tokyo.

1-2 Objectives and Surveyed Matters

The overall objectives of the survey on the Data Bank System Development Project was to confirm the scope of the Data Bank System, to investigate the requirements of the Indonesian persons concerned the said project, to collect necessary information and to propose the implemation program for the Data Bank System.

To fulfill the said objectives, the field survey in the Republic of Indonesia was performed, by the mission from JICA, on the following items during the period between November 20 and December 25, 1978.

(1) The scope of the Data Bank System
(2) Working system of PERTAMINA organization
(3) Present available status of computer system
(4) Quantity, kind, frequency of occurrence and flow of data of Unit II
(5) Present reporting system and format coming in and going out Unit II
(6) Currently applied data filing system and application softwares of Unit II
(7) Present status of local fabrication of raw data of Unit II
(8) Currently applied code system of data
(9) Present status of data storing condition of Unit II

(10) Requirements of persons relating to the Data Bank System

(11) Selection and collection of data and reports related to the Data Bank System

After the mission's returning to Japan, the Japanese survey team analyzed the data and information obtained by the field survey, framed the concept of the Data Bank System, and prepared the implementation program for the establishment of the Data Bank System.

1-3 Field Survey Results

The mission from JICA discussed the said survey items with the Indonesian counterpart teams and collected the necessary data.

The matters confirmed by the both teams, the JICA mission and the Indonesian counterpart team, in the course of the discussion are referred to ANNEX-1 "Minutes of meetings on survey for setting up of the Petroleum Exploration and Production Data Bank System in Indonesia" together with the record of activities performed by the mission and list of data and reports collected during the field survey.

1-4 Overall Survey Results

After the mission's returning to Japan, the Japanese survey team analyzed the data and information obtained by the field survey, framed the concept of the Data Bank System in Chapter 2 on the basis of the analyzed results and prepared the proposed implementation program in Chapter 3 for the purpose of discussing and elabolarating the related matters with the Indonesian counterpart team so as to match them to the Indonesian requirements.

Chapter 2 BASIC CONCEPT OF THE DATA BANK SYSTEM

2-1 General Remarks

The Japanese survey team framed the concept of the Petroleum Exploration and Production Data Bank System on the basis of the matters confirmed by the both teams, the JICA mission and the Indonesian counterpart team in ANNEX-1.

It is understood that the Data Bank System should be installed at Unit EP-II Head Office, having the data related to the exploration and production of PERTAMINA's operation area of Unit II in its data base. And input and output data for the Data Bank System will be designed based on English.

In the course of analysis, the data and information obtained by the field survey were analyzed and rearranged to draw up a blue print of the Data Bank System and selected input data items for the Data Bank System. Organization of the whole PERTAMINA is referred to EXHIBIT-1-1 and that of PERTAMINA Unit EP-II is referred to EXHIBIT-1-2. The data flow based on PERTAMINA Unit EP-II Head Office is described in EXHIBIT-2-1 and reports are listed by the data flow number specified conveniently in EXHIBIT-2-2. References are made to EXHIBIT-3-1 and EXHIBIT-3-2 on the data information flow and the conceptual diagram of the Data Bank System in Unit EP-II Head Office.

Much effort was made to select appropriately the input data items for the data base as in ANNEX-2.

The Data Bank System are conceptualized by the Japanese survey team as in the flowings by drawing up its blue print and concreting the input data items in it.

2-2 Blue Print of the Data Bank System

2-2-1 Computer System

It is possible to establish the Data Bank System based on the present configuration of the computer system

in EXHIBIT-4. However minor modification is expected to carry out with the output processing unit, the data entry processing unit and memory system.

An examination should be made on the feasibility of utilizing the Information Mamagement System (IMS) taking account of the following items.

1) Data structure
2) Data storage structure
3) Kind of output report
4) Security and maintenance
5) Data base management

2-2-2 Data Volume

It is recommended that the historical data should be prepared in the manner of going back from the latest to the older. The Japanese survey team has understood that storing of the data in the latest five years is most efficient and useful taking into consideration that the later data is more valuable, because of updating progress in the engineering and technical fields of the petroleum exploration and production.

Five years input data should be prepared at a stretch because of preventing from being so tedious that might lead to giving up.

After establishing the Data Bank System for five year input data, remaining power should be paid to prepare and store the input data for the older data keeping pace with normal operation of the Data Bank System.

2-2-3 Function of the Data Bank System

As regarding the requirement (4) in II of ANNEX-1, it is necessary to establish the coding and indexing system for the intergrated data filing system which is decided by

PERTAMINA until and initiation of the detailed design work, because the format of the input data is determined by utilizing of the coding and indexing system.

As regarding the requirement (8) in II of ANNEX-1, it is possible to design the Data Bank System having a function as one unit of the Data Bank System of the whole Republic of Indonesia by selection of proper key words.

Considering matters agreed in ANNEX-1 by both parties and an essential property of a data bank system, the following four fundamental function should be retained for making the output reports and data.

(1) The function for retrieving and combining necessary data from various independent data groups in designed format.
(2) The function for making data cross-reference.
(3) The function for making statistical table, if necessary.
(4) The function for file reference.

By executing these functions in combinations, the items required for routine report making could be retrieved, new type reports as required be produced, necessary statistical table be prepared and file reference be made.

2-3 Input Data Item

The Japanese survey team analyzed in detail the understandings in II of ANNEX-1 and collected data listed in ATTACHMENT-IV and APPENDIX-VIII in ATTACHMENT-V of ANNEX-1 and prepared a proposed input data item as in ANNEX-2.

The above analysis and the selection of the input data items in ANNEX-2 were worked out from the following standpoints.

(1) The data with high degree of objective element such as the field source data should be preferentially selected as input data for the Data Bank System, and

the data with subjective element such as data resulted in engineering or studying be properly excluded.

(2) Consideration should be taken to select the input data items which are not able to prepare due to the present situation of PERTAMINA organization but will be prepare in near future.

(3) Concentration should be paid to establishment of a hierarchical structure by grouping and classifying the selected data for improving an efficiency of the designing work itemized as follows.

1) Input method and procedure
2) Classification of output data
3) Retrieving method of output item
4) Kind of cross-reference table
5) Classification of file, sub-file and table
6) Settlement of file organization
7) Estimation of input data volume

The selected input data items in ANNEX-2 are classified into the following ten information groups.

A. Operation Area Information
B. Geophysical Information
C. Geological Information
D. Well Data Information
E. Petrophysical and Fluid Property Information
F. Pressure Production Data Information
G. Reserves Information
H. Production Operation Information
I. Production Facilities Information
J. Pipeline Information

The hierarchical structure is established on the each information group. In the structure, the items are hierarchically grouped by classification code which is consisted of first code, second code, third code and etc.

The common factors in identification of data items in

group are selected and grouped as common identification items in code number 0 of each classification code.

Supplemental explanation are made in ATTACHMENT-I, II, III, IV, V, VI, VII and VIII of ANNEX-2 on the data items which are considered necessary for specifying in more concrete form.

Notwithstanding necessity of their definition in concrete form, it is impossible to propose the definition of the data items such as location name, area name and station name because of a lack of information. In the course of proceeding the project the above mentioned data items should be discussed and elaborated on completed form with the Indonesian users.

Supplemental explanation is made on the each information group as follows.

2-3-1 Operation Area Information

This information group contains the information of locations, sizes, topographic map and histories of contract relating to the PERTAMINA Unit-II direct operation areas.

This information group is classified into two minor information groups at the first code such as "topographic information" and "contract information".

Items related to these information groups in ANNEX-5 are self-explaining in themselves because of a relatively small scale of information group with about thirty items.

2-3-2 Geophysical Information

This information group is composed of the information relating to the field operation, data processing and interpretation of each geophysical survey such as seismic survey, magnetic survey and gravity survey.

The selection of items is especially made in the manner of storing the information relating to the electrical survey which might be conducted in future.

The supplemental explanation relating to the geophysical information group is made as follows.

1) This information group is classified by surveys into four categories, "seismic survey information", "magnetic survey information", "gravity survey information" and "other survey information" at the level of first code.
2) This information group is classified by stages of survey procedure into three categories, "field operation information", "data processing information" and "interpretation information" at the level of second code.
3) In seismic survey information group classified at the level of first code, items relating to "well shooting information" are classified at the level of third code together with items relating to "other survey information".
4) "Cost information" is classified at the level of fourth code together with "site description", "survey method" and "summarized results".
5) The supplemental explanation relating to "classification of site description" at the level of fourth code is made in ATTACHMENT-I of ANNEX-2.

2-3-3 Geological Information

This information group is composed of the information relating geological survey, geological analysis, geological study and their reports.

Supplemental explanation relating to the geological information group is made as follows.

1) This information group is classified into the following three minor information groups at the level of first code.

   - Geological survey information
   - Geological analysis information
   - Study result and report information

   It is noted that study result and report of geological survey and geological analysis are classified independently of other two information groups at the level of first code so as to enable them to be retrieved independently in an efficient manner.

2) Reference is made to D-1-4 and D-2-4 of ANNEX-2 of "well data information" on geological information obtained from wells.

3) Although a little or no existance of their information relating to source rock analysis, pollen analysis and diatom analysis, these are classified at the level of second or third code in "geological analysis information" expecting their future accumulation in PERTAMINA.

4) The report information classified at the level of third code includes not only geological reports but exploration progress reports classified at the level of third code.

2-3-4 Well Data Information

This group is composed of the information relating to the drilling operation, geological data, testing, test data, completion work and workover operation of individual well.

Followings are supplemental explanation of this information group.

1) This information group is classified into two categoris, "original drilled information" and "workover information" at the level of first code so as to retrieve their data in chronological order efficiently.

2) Both of the above information group are classified into the following five minor groups at the level of second code in the same manner, considering their essential properties. (Note:"Deepening well job" is also taken into account as a type of workover operation)

- General information
- Completion information
- Drilling or workover information
- Geological information
- Testing information

As regards the classification of the both major information groups, all the information but "general information" itemized above are classified in the same manner at the level under second code.

3) "Completion information" itemized in 2) is composed of the information relating to the well specification and well completion status including artificial lifting, which are classified at the level under second code.

4) The selection of items is especially made in the manner of storing the information relating to the deviated well, injection well and submergible pump of artificial lifting which might be conducted in future.

5) The requirement relating to Well Data of Indonesian side, shown in APPENDIX-IV of ATTACHMENT-V of ANNEX-1 is completly satisfied.

2-3-5 Petrophysical and Fluid Property Information

This information group is composed of "core analysis information" and "PVT analysis information".

The supplemental explanation relating to "petrophysical and fluid information" group is made as follows.

1) This information group is classified into the following two minor information groups at the level of first code.

- Core analysis information
- PVT analysis information

2) The supplemental explanation relating to "kind of analysis" at the level of second code in "core analysis information" is made in ATTACHMENT-VI of ANNEX-2.

3) "PVT analysis information" is classified into the following four minor information groups at the level of second code.

- Oil reservoir PVT analysis
- Condensate reservoir PVT analysis
- Volatile oil reservoir PVT analysis
- Compositional studies and water analysis

The supplemental explanation relating to each "kind of analysis performed" in "summalized information" at the level of third code is made in ATTACHMENT-VII, VIII, IX and X of ANNEX-2 respectively.

2-3-6 Pressure and Production Data Information

This information group is composed of information relating to production, gas consumption, subsurface pressure data and injection data.

The supplemental explanation relating to "pressure and production data" is made as follows.

1) This information group is classified into five minor information groups at the level of first code.

- Monthly production and pressure data
- Subsurface pressure data
- Injection data
- Gas lift information
- Gas consumption data

2) As regards "monthly production and pressure data" a selection of item and its classification at the level under second code are made in the manner of making statistical table efficiently.

3) Reference is made to the information in H-1-4-1, H-1-4-3 and H-1-4-7 in ANNEX-2 on the following items relating

to "subsurface pressure data".

- General information
- Production or injection information
- Static bottom hole pressure, temperature and their depthes

4) The selection of items and its classification at the level of first code is made in the manner of storing the information relating to the water and gas injection which might be performed in future.

5) The items classified at the level of second code in "gas consumption data" are selected on the basis of Pemakaian Gas Harian Tekanan Tinggi MMSCFD/FBTU-1977 in Laporan Tahuman 1977, Bidang Exsploitasi PERTAMINA Unit EP-II Plaju in APPENDIX-VIII of ATTACHMENT-V of ANNEX-1.

6) The selection of items relating to "monthly production and pressure data" and "gas lift information" is made in the manner of fulfilling Indonesian requirements that the Data Bank System can produce efficiently the output reports described in APPENDIX-VI of ATTACHMENT-V of ANNEX-1.

2-3-7 Reserves Information

This information group is composed of information relating to original reserves, current reserves, cumulative and current production, revision of reevaluation and study reports of evaluation and reevaluation.

The supplemental explanation relating to "reserves information" is made as follows.

1) This information group is classified into the following two minor groups at the level of first code.

- Reserves information on oil reservoir
- Reserves information on gas reservoir

2) Both of above information group are classified into the following items relating to oil and gas respectively at the level under first code.
   - Reserves at the beginning of year
   - Current productions
   - Extension or reduction
   - Engineering report
   - Reserves at the end of year

3) As regards "reserves information on gas reservoir" at the level of first code, gas reservoir and gas condensate reservoir are to be distingished by item "kind of reservoir" at the level of second code.

2-3-8 Production Operation Information

This information group is composed of information relating to "well test" including "injection test" and "field laboratory fluid analysis".

The supplemental explanation relating to "production operation information" is made as follows.

1) This information groups is classified into the following two minor information groups at the level of first code.
   - Well test information
   - Field laboratory fluid analysis information

2) "Well test information" is classified into the following four minor information groups at the level of second code.
   - Well production or injection ability test information
   - Production information
   - Injection test information
   - Subsurface pressure survey information

3) Reference is made to information in D-1-2 or D-2-2 in ANNEX-2 on the following information relating to "production test information", "injection test

information" and "subsurface pressure survey information" described in 2).

- Type of completion (dual, annulus, single, twin, triple or others)
- Type of producing method (natural flow, rod pump, submergible centrifugal pump or gas lift)
- Hole size and casing information
- Completion string information in case of well other than artificial lifting well
- Completion string and rod pumping information in case of rod pump well
- Completion string and submergible centrifugal pumping information in case of submergible centrifugal pump well
- Completion string and gas lift information in case of gas lift well
- Perforation information
- Completion fluid
- Wellhead assembly
- Abandonment condition

4) "Field laboratory fluid analysis information" at the level of first code is classified into the following four minor information groups at the level of second code.

- Sampling information
- Oil analysis information
- Gas analysis information
- Water analysis information

2-3-9 Production Facilities Information

This information group is composed of the information relating to the identification, the main specifications and the maintenance history of each station or each kind of

equipment. "Pipeline information" in production facilities is isolated as an independent information group mentioned in 2-3-10 because the method to identify pipeline differs from the other facilities.

The supplemental explanation relating to "production facilities information" group is made as follows.

1) This information group is classified into the following items at the level of first code. In case of the classification by first code, it is taken into account that such machinery as pump, compressor, generator, fan or blower, agitator and other machinery is combined with its prime mover and the information of machinery is able to be retrieved as one set. These are classified into the two information groups relating to machinery and its prime mover respectively at the level of second code so as to enable to retrieve them efficiently in a respective separate group.

   - Station general information
   - Vessel
   - Tank
   - Heat exchanger
   - Fired heater
   - Refrigerator
   - Pump and its prime mover
   - Compressor and its prime mover
   - Generator and its prime mover
   - Fan or blower and its prime mover
   - Agitator and its prime mover
   - Other machinery and its prime mover
   - Fire fighting system
   - Flare system
   - Other equipment

2) Vessels at the level of first code are grouped into the following five kinds having different formats of their specifications. Code number for the above five

kinds of specifications at the level of second code is repeated on their respective information and their detailed items are classified at the level under second code respectively according to their substantial properties.

- Separator, knockout, surge tank, sump tank or air receiver
- Absorber
- Stripper or stabilizer
- Filter
- Adsorber

3) In general there are the following two kinds of refrigerator of which specifications format should be different from each other. Code number for these specifications at the level of second code is repeated on their respective information and their detailed items are classified at the level under second code respectively according to their properties.

- Compression refrigerator
- Absorption refrigerator

4) Prime mover at the level of second code in "pump and its prime mover" are generally grouped into the following three kinds having different formats of their specifications. Code number for the above three kinds of specifications at the level of third code is repeated on their respective information and their detailed items are classified at the level under third code respectively according to their properties.

- Electric motor
- Internal combustion engine or steam engine
- Gas turbine

5) The specifications at the level of third code for the following five items are classified after the same manner as in "pump and its prime mover" described in 4). Therefore, in order to avoid the repetition of these "prime mover" specifications, it is only described that these specifications should be referred to the

detailed items of specifications concerning "prime mover" in "pump and its prime mover".

- Compressor and its prime mover
- Generator and its prime mover
- Fan or blower and its prime mover
- Agitator and its prime mover
- Other machinery and its prime mover

6) A selection of items is made on "station general information" for the purpose of grasping the outline of the whole system of stations. Following items are selected at the lower level of code on other items except "station general information" at the level of first code.

- Identification
- Name
- Kind
- Name of manufacturer
- Specification
- Identification of drawing
- Cost information
- Maintenance history

7) Items relating to "maintenance history" are selected in all items classified at the level of first code. The following three minor items concerning inspection and repair are selected to be input according to the kind of work proposed in ATTACHMENT-XI, XII, XIII of ANNEX-2.

- Kind of inspection for vessel, tank, and heat exchanger
- Kind of inspection for condition of machinery and prime mover
- Kind of repair

2-3-10 Pipeline Information

Identification, specification and history of each pipeline between a well and a station, between a station and a

station, and between a station and a final destination, are classified in "pipeline information". Pipeline is identified according to the station or the final destination to which oil and/or gas is destined, which makes it easy to sort pipeline itself. "Pipeline information" are classified at the level of first code as follows.

- Kind of pipeline
- Object of transportation
- Specification of pipeline
- Identification of drawing
- Cost information
- Contract Document
- Maintenance history

Chapter 3 IMPLEMENTATION PROGRAM FOR THE ESTABLISHMENT OF THE DATA BANK SYSTEM

The Japanese survey team prepared the proposed implementation program for the establishment of the Petroleum Exploration and Production Data Bank System in Republic of Indonesia.

The program was prepared based on the basic concept for the Data Bank System in Chapter 2 and the matters confirmed by the both sides in ANNEX-1.

This chapter is consisted of the two sections, outline and method of work in 3-1, and estimated manpower and time schedule in 3-2.

3-1 Outline and Method of Work

As the Data Bank System should be established based on the requirements of the Indonesian users, it is necessary for the project executor to have meeting at each step of work for the purpose of the acquisition of Indonesian users' requirements.

The work for implementation of the Data Bank System would be composed of the following three phases taking into the above-mentioned matters and the characteristics of the work.

Phase I Design for the Data Bank System
Phase II Computer Application to the Data Bank System
Phase III Assistance for Preparation of Input Data

Detailed contents of the work for each phase are described as follows.

3-1-1 Phase I System Design

The design work for the Data Bank System would be

carried out in accordance with the following two steps, conceptual system design and detailed system design.

3-1-1-1 Conceptual System Design

The work for conceptual system design will be classified into the following three steps which are described in order as follows.

- Preparation of draft report of conceptual system design
- Presentation to the Indonesian users
- Preparation of report of conceptual system design

(1) Preparation of draft report of conceptual system design

A detailed work procedure for conceptual system design is itemized in EXHIBIT-5. A summary of the work is described as follows.

In a work procedure for conceptual system design, the input format for the final input data items to be stored in the data base will be determined and the data tree will drawn, and the conceptual design work of files relating to input data will be performed. As regards output data, the classification of output reports and the selection of a key word for retrieving output item will be made, and the output method and procedure will be settled, consulting with the system function described in the concept of the Data Bank System, that is, the function for retrieving and combining necessary data from various independent data groups in designed format, the function for making data cross-reference, the function for making statistical table if necessary, and the function for file

reference. As regards files, an examination on feasibility of utilization of Information Management System (IMS) will be carried out taking account of the file efficiency. And in this work procedure, the conceptual system design relating to data processing flow and a kind, number, size and conceptual function of programs for the Data Bank System will be performed.

As regards the processing unit of computer system, it is possible to establish the Data Bank System based on the present configuration of the computer system in PERTAMINA Unit II. However, if necessary, a recommendation will be made on a minor modification of the computer system at the completion of the conceptual system design. Minor modification may be concerned with the output processing unit, the data ertry processing unit and memory unit.

The results of conceptual system designing work will be summarized in a draft report of conceptual system design. The basic plan concerning to introduction and handling of the Data Bank System and the plan for the preparation of manual will be involved in this draft report.

(2) Presentation to the Indonesian users

It is the most important for the project executor to discuss the contents of the draft report of conceptual system design with the Indonesian users at this step, in order to satisfy their requirements for the basic concept of the Data Bank System to be established.

It will be easier to modify the results of conceptual system design as compared with those of detailed system design described latter. For this reason, all the requirements for the results of conceptual system design should be obtained from the Indonesian users and

modifications subjected to those should be performed in this stage as much as possible.

At this time, the necessary information relating to detailed system design should be collected to be carried out successively.

For these purposes the project excutor should be assigned the following eight experts from various fields.

Geophysicist	1 person
Geologist	1 person
Drilling Engineer	1 person
Petroleum Engineer	1 person
Reservoir Engineer	1 person
Mechanical and/or Process Engineer	1 person
System Analyst	1 person
Computer Hardware Engineer	1 person

In addition to the above the experts will discuss also the basic plan of introduction and handling of the Data Bank System with the Indonesian users.

(3) Preparation of report of conceptual system design

After the acquisition of the Indonesian users' requirements, the experts will modify the draft report as much as possible taking account of the efficiency of the Data Bank System, on the basis of examination and analyzation results of the requirements, and will prepare the report of conceptual system design.

3-1-1-2 Detailed System Design

The work for detailed system design will be classified

into the following three steps which are described in order as follows.

- Preparation of draft report of detailed system design
- Presentation to the Indonesian users
- Preparation of report of detailed system design

(1) Preparation of draft report of detailed system design

A detailed work procedure for detailed system design is itemized in EXHIBIT-6. A summary of the work is described as follows.

As regards output report of which kind is already determined in conceptual system design, their format will be designed in detail in the actual printed-out form and also their processing method will be determined in this step. The coding system involving the necessary key word for output will be established in a form of coding book. The sheet form will be designed for the input data item to be stored in the data base of the Data Bank System, taking account of the easier way for preparation of input data. At the same time, the data check method will be designed and the data entry system preventing an error data from storing will be established.

Tables and files relating to the data base will be designed for the purpose of making it efficient to store the input data into storage device and to retrieving these data from the files. As a result, the program specification report for making the programs to be equipped for the Data Bank System will be prepared, and the report should include a planning of debugging and test method of programs.

The results of detailed system designing work will be summarized in a draft report of conceptual system design.

(2) Presentation to the Indonesian users

As the Indonesian users' requiremnets are already taken into consideration relating to the basic concept of the Data Bank System, in this step the users' requirements will be focusted to discuss mainly relating to the actual format for input and output data.

For this purpose the project executor should be assigned the following four experts.

Exploration Engineer	1 person
Petroleum Engineer	1 person
Reservoir Engineer	1 person
System Analyst	1 person

(3) Preparation of report of detailed system design

After the completion of the presentation to the Indonesian users, the experts will modify the draft report as much as possible, on the basis of examination and analyzation results on the users' requirements, and will prepare the report of detailed system design. This report will be the final system report of the Data Bank System.

3-1-2 Phase II Computer Application to the Data Bank System

The computer application work to be succeeded to the Phase I work will be performed in the following three steps which are described as follows.

- Programming, debugging and test
- Introduction of the Data Bank System to Computer System
- Preparation of manuals

(1) Programming, debugging and test

The work procedure for this step will be itemized as follows.

1) Programming
   a) Description of the detailed processing step of program and subprogram
   b) Coding
2) Preparation of test data
3) Debugging and test
   a) Single test
   b) Total test
4) Preparation of the draft manual
   a) System manual
   b) Introduction and handling manual

Programming of the programs to be equipped for the Data Bank System will be performed by the instruction of the detailed report which is finally agreed by both sides in Phase I. The detailed specification of the programs and subprograms will be shaped in more concrete form by using the Hierarchy plus Input Process Output (HIPO) method and will be coded by using the HIPO.

On the other hand, data for a test run are prepared parallel with the above-mentioned work in the manner of testing whether programs function normally or not, considering quality and quantity of data. Applying these data including some suitable error data to program or sets of programs utilizing a computer system in hands of the executor.

Programs having passed an examination of a trial test will be stored in a magnetic tape or a diskette to transport to Unit II at Plaju. In this step necessary manuals, that is, a system manual and a introduction and handling manual of the Data Bank System will be drafted.

(2) Introduction of the Data Bank System to Computer System

Introduction of the Data Bank System to the computer system in Unit II will be performed by executing the programs stored in a magnetic tape or a diskette on the unit II computer system. Introduction of the system will be performed on the basis of the basic plan for introduction which is to have been agreed by both sides in the conceptual system design.

As the work in Phase III described in the following part of this report will be able to start soon after the completion of the work (1) in this phase, it is assumed to commence the work in Phase III at the time of the completion of the work (1).

As the actual input data for the Data Bank System will be prepared, stored and accumulated in accordance with the progress of the Phase III work, it will be most efficient to introduce the Data Bank System in the work (1) to the Unit II computer system when accumulation of the data attain certain level in the data base.

It is to be desired that all the programs should be modified and confirmed with applying the actual input data to Unit II computer system at the time of intorudction. For this purpose the project executor should be assigned the following four experts.

System Analyst	2 persons
System Operation Engineer	1 person
Programmer	1 person

(3) Preparation of Manuals

The above-mentioned work of introduction and handling of the Data Bank System in Unit II will be performed in accordance with the system manual and the draft of introduction and handling manual of the Data

(1) Programming, debugging and test

The work procedure for this step will be itemized as follows.

1) Programming
   a) Description of the detailed processing step of program and subprogram
   b) Coding
2) Preparation of test data
3) Debugging and test
   a) Single test
   b) Total test
4) Preparation of the draft manual
   a) System manual
   b) Introduction and handling manual

Programming of the programs to be equipped for the Data Bank System will be performed by the instruction of the detailed report which is finally agreed by both sides in Phase I. The detailed specification of the programs and subprograms will be shaped in more concrete form by using the Hierarchy plus Input Process Output (HIPO) method and will be coded by using the HIPO.

On the other hand, data for a test run are prepared parallel with the above-mentioned work in the manner of testing whether programs function normally or not, considering quality and quantity of data. Applying these data including some suitable error data to program or sets of programs utilizing a computer system in hands of the executor.

Programs having passed an examination of a trial test will be stored in a magnetic tape or a diskette to transport to Unit II at Plaju. In this step necessary manuals, that is, a system manual and a introduction and handling manual of the Data Bank System will be drafted.

(2) Introduction of the Data Bank System to Computer System

Introduction of the Data Bank System to the computer system in Unit II will be performed by executing the programs stored in a magnetic tape or a diskette on the unit II computer system. Introduction of the system will be performed on the basis of the basic plan for introduction which is to have been agreed by both sides in the conceptual system design.

As the work in Phase III described in the following part of this report will be able to start soon after the completion of the work (1) in this phase, it is assumed to commence the work in Phase III at the time of the completion of the work (1).

As the actual input data for the Data Bank System will be prepared, stored and accumulated in accordance with the progress of the Phase III work, it will be most efficient to introduce the Data Bank System in the work (1) to the Unit II computer system when accumulation of the data attain certain level in the data base.

It is to be desired that all the programs should be modified and confirmed with applying the actual input data to Unit II computer system at the time of intorudction. For this purpose the project executor should be assigned the following four experts.

System Analyst	2 persons
System Operation Engineer	1 person
Programmer	1 person

(3) Preparation of Manuals

The above-mentioned work of introduction and handling of the Data Bank System in Unit II will be performed in accordance with the system manual and the draft of introduction and handling manual of the Data

Bank System in the work (1). Necessary information for the final manual will be obtained at the time of confirmation of the normal operation of the Data Bank System. The draft manual of introduction and handling manual will be modified according to obtained information and the final manuals will be prepared after completion of the introduction.

3-1-3 Phase III Assistance for Preparation of Input Data

The following implementation program is prepared on the premise that PERTAMINA will operate the Data Bank System by himself. Considering this, the data base should be established by PERTAMINA. It will be the best method for the project executor to assign the experts to assist PERTAMINA in establishment of the data base.

The historical data volume to be stored in the data base has been agreed in ANNEX-1, "Minutes of meetings on survey for setting up of the Petroleum Exploration and Production Data Bank System in Indonesia". In accordance with this minutes the data base should have the historical data related to geological & geophysical data since 1966, all the well data file, production statistics data since 1966 (only monthly figures) and existing production facilities data.

As mentioned in Chapter 2, it is recommended that the historical data should be prepared in the manner of going back from the latest to the older for the purpose of the most efficient work taking into consideration that the later data is more valuable. And also the Japanese survey team has understood that storing of the data in the latest five years is the most efficient and useful taking account of the results of the field survey in Republic of Indonesia, because of updating progress in the engineering and technical fields of the petroleum exploration and production, and the

five years input data should be prepared at the stretch within one year.

The following implementation program is prepared on the premise that the data base will be established in one year by storing five years input data.

3-1-3-1 Work Procedure for Preparation of Input Data

The following work procedure will be necessary for establishment of the data base.

(1) Preparation of implementation program for detailed work

(2) Preparation of input data
1) Collection and arrangement of input data
2) Recording data into data sheet
3) Recording data into diskette
4) Checking of error data

(3) Establishment of data base
1) Creation of file for data base
2) Checking of error list and proof list
3) Creation of data base and confirmation of data list

3-1-3-2 Organization of PERTAMINA's Project Team for Implementation of Work

The following members from PERTAMINA will be necessary for establishment of the data base in PERTAMINA EP-II related to storing the data in the latest five years in accordadne with the above-mentioned work procedure.

(1) Expert group

Exploration Engineer	1 person
Production Engineer	1 person
Mechanical and/or Process Engineer	1 person
System Analyst	1 person

(2) Coordination group

Data entry section	1 person
Data center section	1 person

(3) Working group — Number of this group will be determined taking account of a work condition.

The work of the expert group consists of planning the implementation program for the detailed work, collection and arrangement of input data, leading the working group and managing the work for establishment of the data base. For this reason it will be necessary to have the qualification for treatments of the exploration and production data and for the negotiation with the data entry section and the data center section.

As the work of the coordination group is to coordinate the use of the necessary device, which are installed in the data entry section and the data center section, for establishment of the data base in accordance with the implementation program and to assist the work for establishment of the data base, it will be not always necessary to keep their full time for this purpose.

It is to be desired that a suitable number of members for the working group is determined by expert group at each time taking account of the actual efficiency of the work. The work of the working group consists of mainly recording data into the input data sheet in accordance with the instruction of the expert group. And it is to be desired that this member has the qualification of or equivalent to a high school, because the work of handling a simple device for input, checking and correcting of error data will be required.

3-1-3-3 Assistance for Establishment of the Data Base

The work for establishment of the data base will be proceeded with the contents of the work (3-1-3-1) by the PERTAMINA's organized project team (3-1-3-2). However, for the purpose of proceeding the project smoothly it is recommended to have the direct guidance of designers and the necessary manuals relating to system design and handling of the Data Bank System.

For this perpose the project excutor should select and assign the following six experts who will consult the PERTAMINA's organized project team in a man-to-man form in accordance with the said manuals.

Exploration Engineer	1 person
Drilling Engineer	1 person
Petroleum Engineer	1 person
Reservoir Engineer	1 person
Mechanical and/or Process Engineer	1 person
System Analyst	1 person

3-2 Estimated Manpower and Time Schedule

The Japanese survey team estimated a manpower required for the performance of establishment of the Data Bank System. The estimation is made on the basis of the outline and method of work in the previous section and the concept of the Data Bank System in Chapter 2. As a result the estimated manpower and necessary qualification are shown EXHIBIT-7-1 by events in the course of proceeding the work of establishment of the Data Bank System.

And also an example work schedule is shown in EXHIBIT-7-2 and this is prepared on the basis of the efficient member of experts to be participated at the same time in the project and taking into consideration the Indonesian situation

impressed by the Japanese survey team in their stay in Republic of Indonesia. The period for the work in EXHIBIT-7-2 will be variable depending upon the number of the experts to be assigned at the same time to the project.

The events of the whole work process is summarized in accordance with the items described in the previous section as follows.

3-2-1 Phase I System Design

(1) Conceptual System Design

1) Preparation of draft report of conceptual system design

The work is assumed to start on August 1st 1979, and twenty copies of the draft report of conceptual system design in English will be prepared until the end of March 1980.

2) Presentation to the Indonesian users

The eight experts will be received by the Indonesian users about one month from April 1st 1980, for the purpose of the presentation of the draft report and of a collection of the necessary information for detailed system design.

3) Preparation of report of conceptual system design

Twenty copies of report in English will be prepared until the middle of June 1980, by modifing the draft report.

(2) Detailed System design

1) Preparation of draft report of detailed system design

The work will start on the middle of June 1980 and twenty copies of the draft report of detailed system design in English will be prepared until the middle of November 1980.

2) Presentation to the Indonesian users

The four experts will be received by the Indonesian users about one month from the middle of November 1980 for the final presentation of system design.

3) Preparation of report of detailed system design

Twenty copies of the report will be prepared until the end of January 1981, by modifing the draft report.

3-2-2 Phase II Computer Application to the Data Bank System

(1) Programming, debugging and test

The work will start on February 1st 1981, and will complete until the end of August 1981. Twenty copies of the draft system manual and the draft introduction and handling manual related to the Data Bank System will be prepared until the end of August 1981.

(2) Introduction of the Data Bank System to Computer System

The four experts will be received by the Indonesian users on November 1st 1981, for the purpose of introduction of the Data Bank System in PERTAMINA Unit EP-II.

(3) Preparation of manuals

Twenty copies of the manual in English will be prepared until the end of February 1982. Two copies of output list of all the programs to be used in the Data Bank System will be prepared at this time.

3-2-3 Phase III Assistance for Preparation of Input Data

The six experts will be received by the Indonesian users about three months from the beginning of September 1981 for the purpose of the guidance and assistance of establishment of the data base by PERTAMINA.

Chapter 4 ACKNOLEDGMENT

Japanese survey team appreciates the cooperation of those persons concerned of the Republic of Indonesia all through the survey period in their country.

A special remark is made here to their cooperation for preparing "Technical Terminology, Indonesian to English" in ANNEX-3, which is expected to be completed at the same time that this data bank system project is completed.

LIST OF EXHIBIT

EXHIBIT-1-1

ORGANIZATION OF PERTAMINA

EXHIBIT-1-1

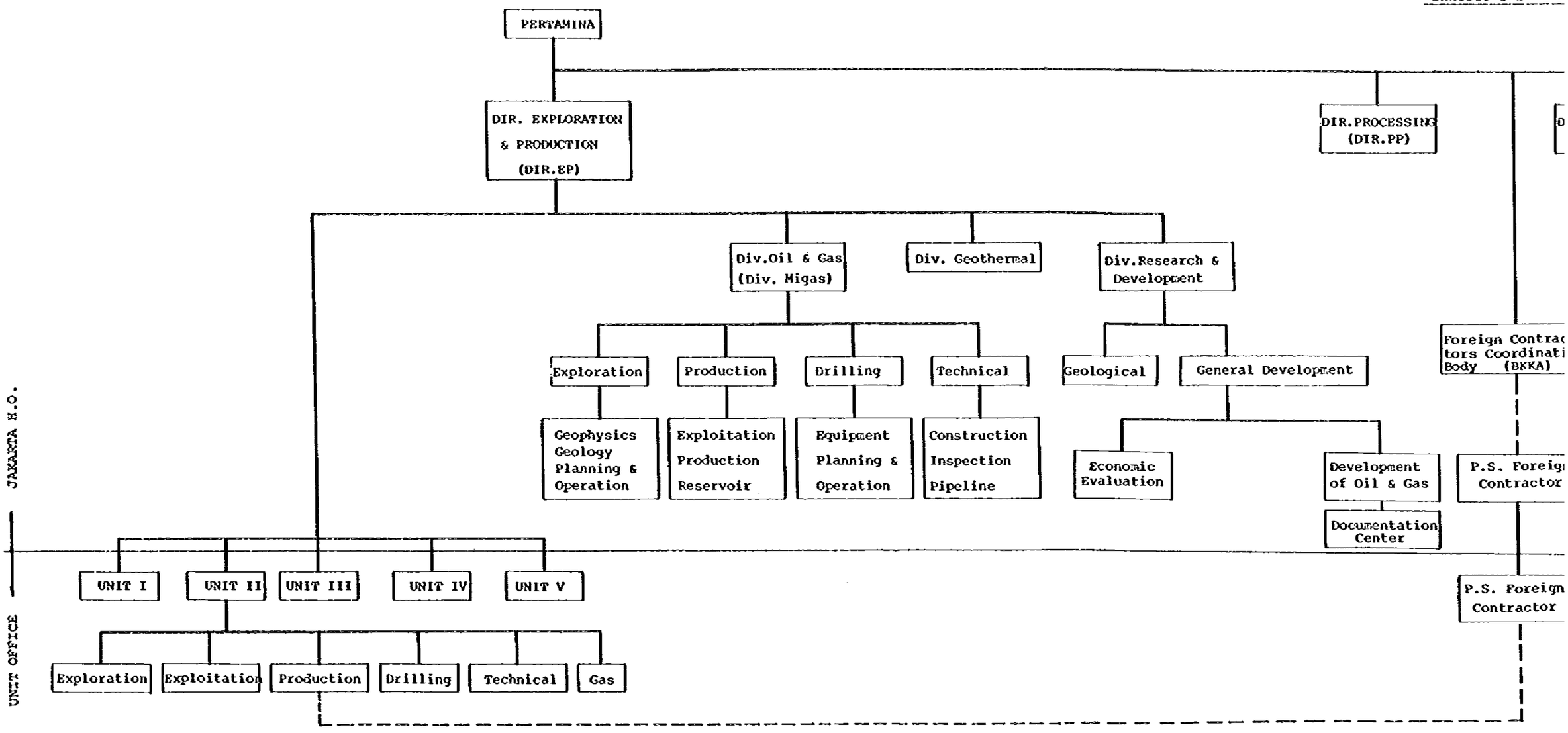

PERTAMINA
DIR. EXPLORATION & PRODUCTION (DIR.EP)
DIR.PROCESSING (DIR.PP)
Div.Oil & Gas (Div. Migas)
Div. Geothermal
Div.Research & Development
Exploration
Production
Drilling
Technical
Geological
General Development
Foreign Contractors Coordinating Body (BKKA)
Geophysics Geology Planning & Operation
Exploitation Production Reservoir
Equipment Planning & Operation
Construction Inspection Pipeline
Economic Evaluation
Development of Oil & Gas
Documentation Center
P.S. Foreign Contractor
P.S. Foreign Contractor
JAKARTA H.O.
UNIT OFFICE
UNIT I
UNIT II
UNIT III
UNIT IV
UNIT V
Exploration
Exploitation
Production
Drilling
Technical
Gas

EXHIBIT-1-1 ORGANIZATION OF PERTAMINA

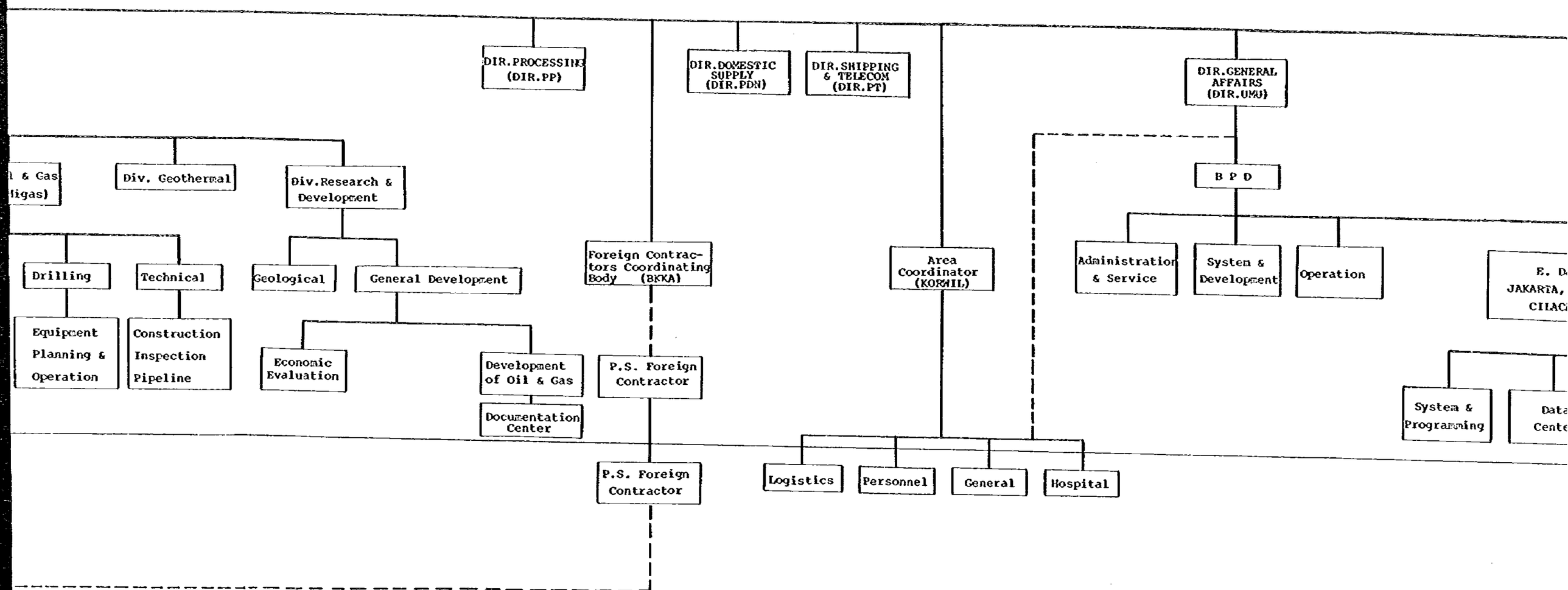


EXHIBIT-1-1 ORGANIZATION OF PERTAMINA

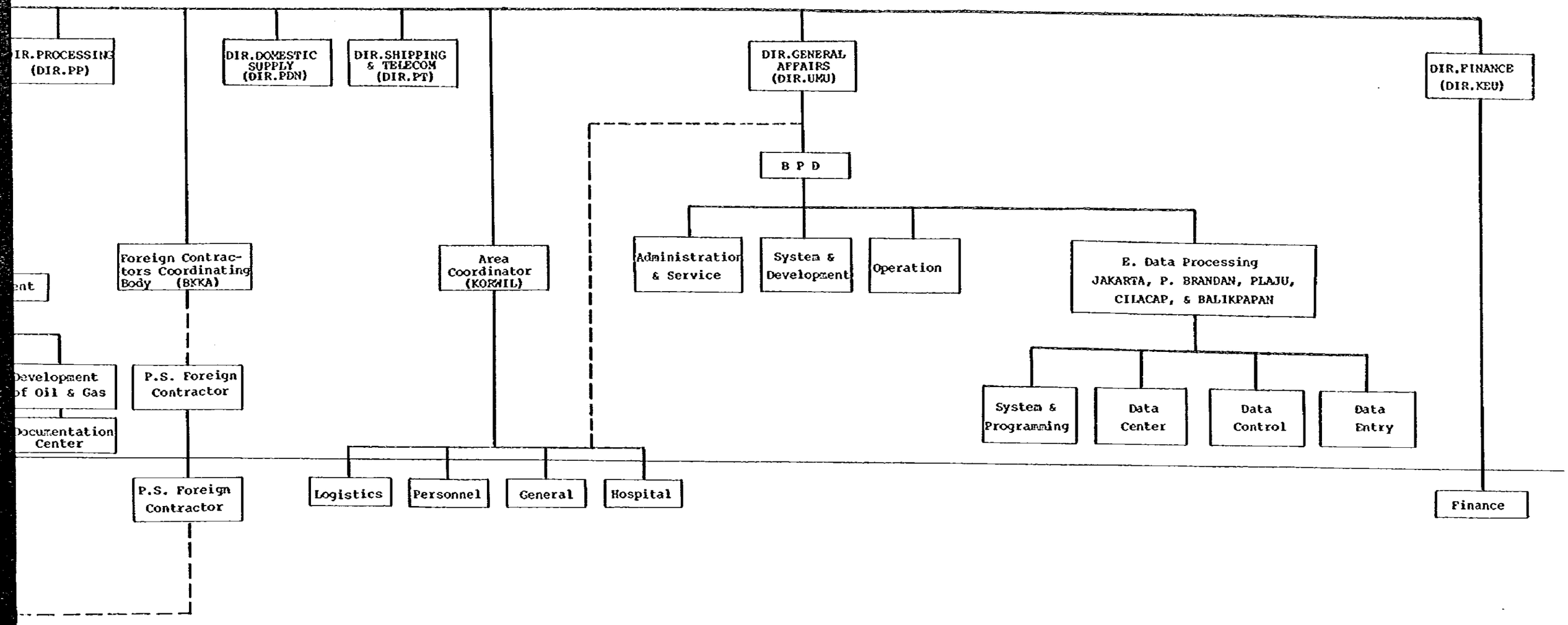


EXHIBIT-1-2

ORGANIZATION OF PERTAMINA UNIT EP-II

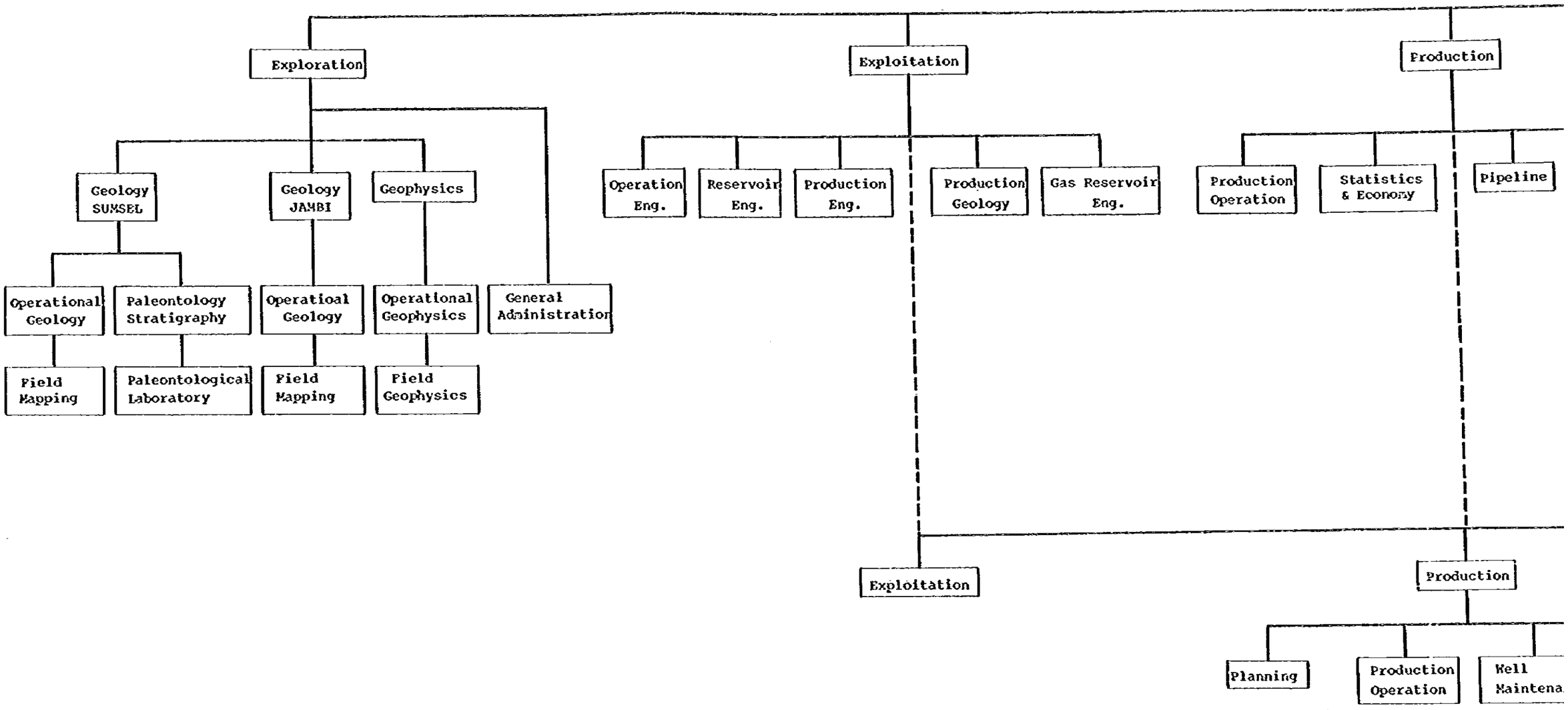

Exploration
Exploitation
Production
Geology SUMSEL
Geology JAMBI
Geophysics
Operation Eng.
Reservoir Eng.
Production Eng.
Production Geology
Gas Reservoir Eng.
Production Operation
Statistics & Economy
Pipeline
Operational Geology
Paleontology Stratigraphy
Operatioal Geology
Operational Geophysics
General Administration
Field Mapping
Paleontological Laboratory
Field Mapping
Field Geophysics
Exploitation
Production
Planning
Production Operation
Well Maintena

EXHIBIT-1-2 ORGANIZATION OF PERTAMINA UNIT EP-II

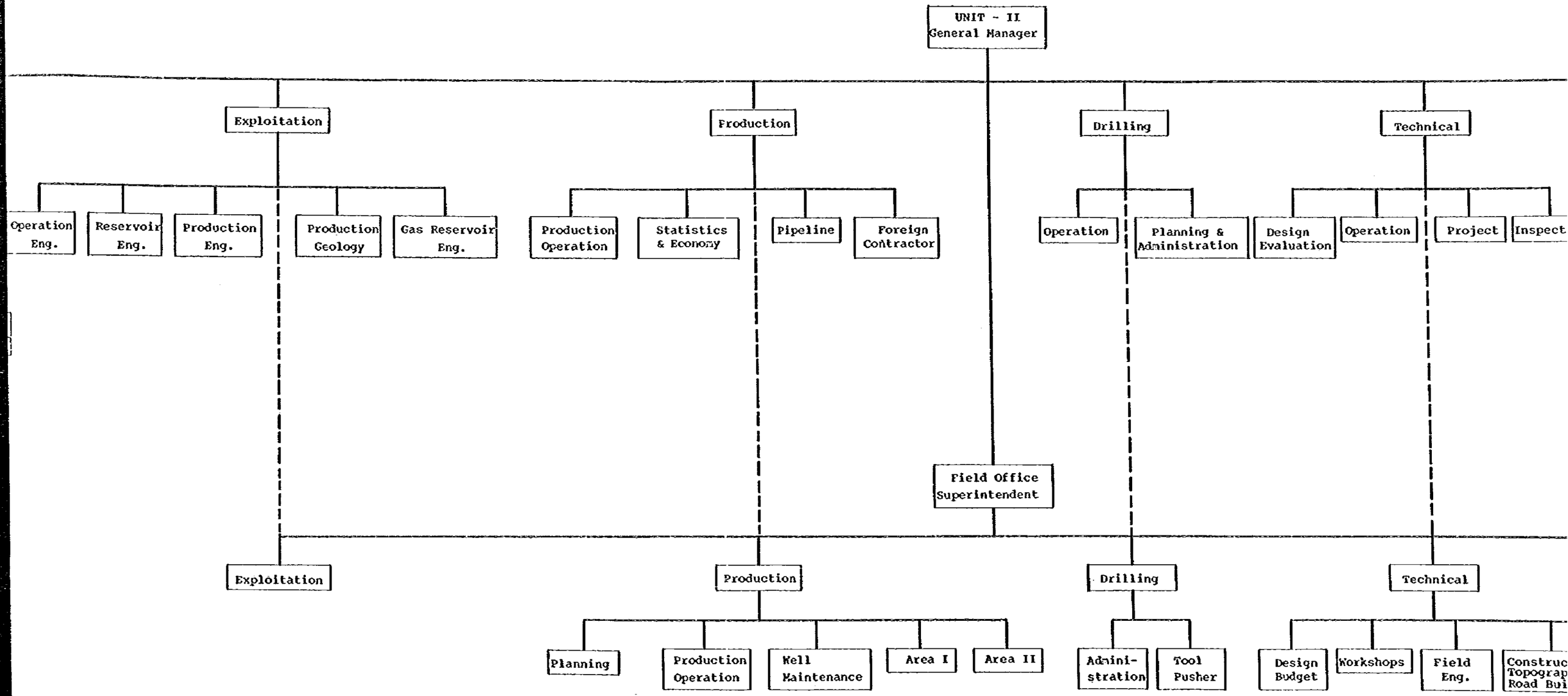
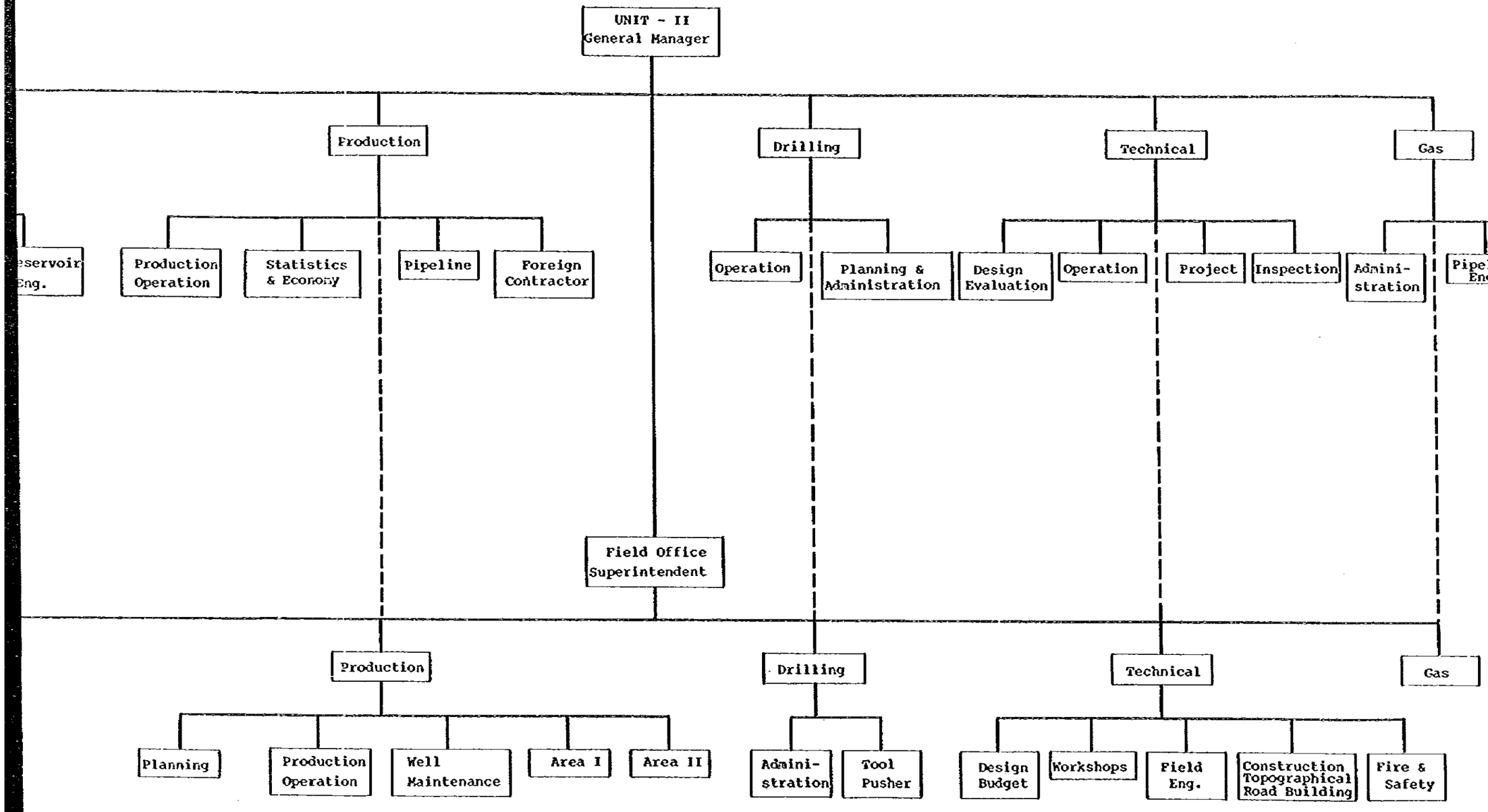


EXHIBIT-1-2 ORGANIZATION OF PERTAMINA UNIT EP-II



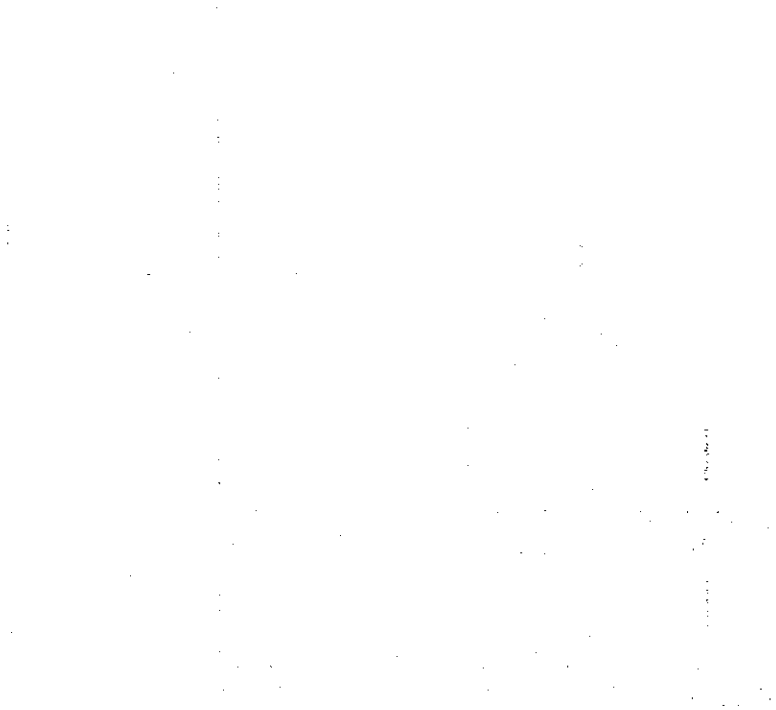


EXHIBIT-2-1

DATA FLOW BASED ON
PERTAMINA UNIT EP-II HEAD OFFICE

EXHIBIT-2-1 DATA FLOW BASED ON PERTAMINA UNIT EP-II HEAD OFFICE

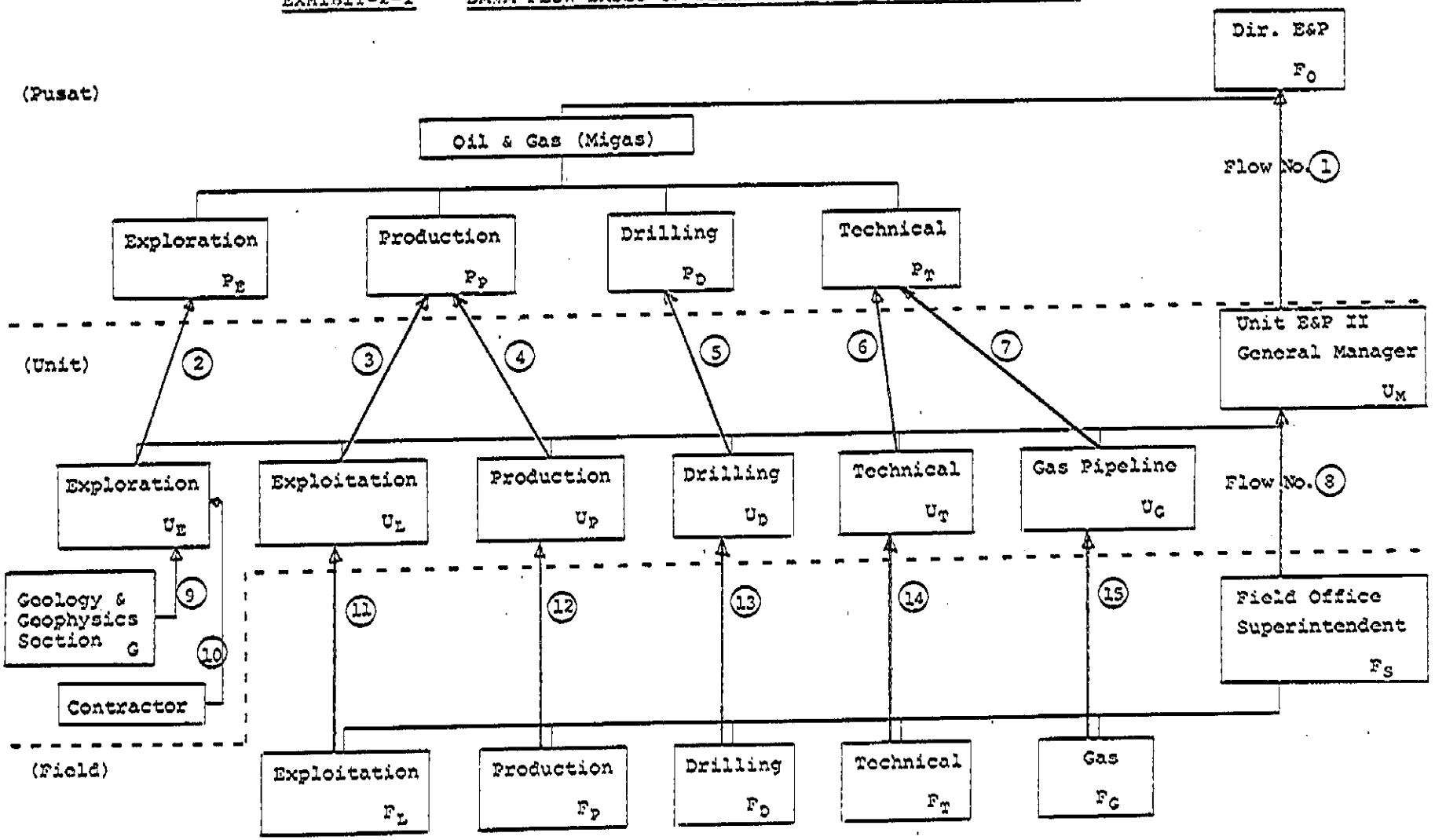


EXHIBIT-2-2

LIST OF REPORT IN
PERTAMINA UNIT EP-II HEAD OFFICE

EXHIBIT-2-2 LIST OF REPORT IN PERTAMINA UNIT EP-II HEAD OFFICE

Output Report going out

Flow No.	Data Flow Field Unit Pusat	Report* No.	Title of Report	Format Yes or No	Frequency
1	$U_M \rightarrow P_O$	1-1	Laporan Bulanan Singkat	o	Monthly
		1-2	Yearly Report	o	Yearly
		1-3	Capital Budget	o	Yearly
2	$U_E \rightarrow P_E$	2-1	Exploration Annual Report (LAPORAN TAHUNAN EKSPLORASI)	o	Yearly
		2-2	Exploration Brief Annual Report (RINGKASAN LAPORAN TAHUNAN EKSPLORASI)	o	Yearly
		2-3	Exploration Monthly Report (LAPORAN BULANAN BIDANG EKSPLORASI)	o	Monthly
		2-4	Exploration Weekly Report		Weekly
		2-5	Seismic Survey Study Report	o	Per Survey
		2-6	Well Proposal (USUL PEMBORAN)	o	Per Well
		2-7	Well Resume (RESUME SUMER EKSPLORASI)	o	Per Well
		2-8	Well Daily Report		Daily
		2-9	Geological Field Mapping Report	o	Per Survey
		2-10	Paleontorogical Report (PEMERIKSAAN MIKROPALEONTOLOGI)	o	Per Well and Survey
		2-11	Special Study Report	o	Per Survey
		2-12	Work Program and Budget	o	Yearly
		2-13	Final Report (Seismic)	o	Per Survey

* Report number is for the convenience.

Flow No.	Data Flow Field Unit Pusat	Report* No.	Title of Report	Format Yes or No	Frequency
2	$U_E \rightarrow P_E$	2-14	Airborne Magnetic Survey Report	o	Per Survey
		2-15	Final Report (Gravity)	o	Per Survey
		2-16	Core Analysis Report	o	Per Well
		2-17	Petrographic Analysis Report	o	Per Well and Survey
		2-18	Paleontrogical Report	o	Per Well and Survey
		2-19	Special Study Report	o	
3	$U_L \rightarrow P_P$	3-1	Daily EPT Report	o	Daily
		3-2	Weekly EPT Report	o	Weekly
		3-3	Monthly EPT Report	o	Monthly
		3-4	Semester EPT Report	o	Semester
		3-5	Yearly EPT Report	o	Yearly
		3-6	Well File	o	per well
4	$U_P \rightarrow P_P$	4-1	Weekly Prod. Report	o	Weekly
		4-2	Monthly Prod. Report	o	Monthly
		4-3	Semester Prod. Report	o	Semester
		4-4	Yearly Prod. Report	o	Yearly
5	$U_D \rightarrow P_D$	5-1	Monthly Drilling Report	o	Monthly
		5-2	Yearly Drilling Report	o	Yearly
6	$U_T \rightarrow P_T$	6-1	Monthly Tech. Report	x	Monthly
		6-2	Yearly Tech. Report	x	Yearly

* Report number is for the convenience.

Flow No.	Data Flow Field Unit Pusat	Report* No.	Title of Report	Format Yes or No	Frequency
7	$U_G \rightarrow P_T$	7-1	Monthly Gas Report	o	Monthly
		7-2	Yearly Gas Report	x	Yearly
		7-3	Been Performance for Gas Well	o	

* Report number is for the convenience.

Report coming in

Flow No.	Data Flow Field Unit Pusat	Report* No.	Title of Report	Format Yes or No	Frequency
8	$F_S \rightarrow U_H$	8-1	Capital Budget	o	Yearly
		8-2	Monthly Report	x	Monthly
9	$\rightarrow U_E$	9-1	Monthly Seismic Survey Report (LADORAN BULANAN PENYELIDIKAN SEISMIK)	o	Monthly
		9-2	Drilling, Recording Dynamite Surmury Report (RINGKASAN LAPORAN PEMBORAN PENEMBAKAN & DINAMIT)	o	Monthly
		9-3	Statistical Daily Recording Progress (STATISTIK KEMAJUAN HARIAN PENEMBAKAN)	o	Monthly
		9-4	Paleontological Laboratory Monthly Report	o	Monthly
		9-5	Monthly Geological Report	o	Monthly
		9-6	Paleontological Laboratory Weekly Report	o	Weekly
		9-7	Weekly Geological Report	o	Weekly
		9-8	Paleontological Laboratory Daily Report	o	Daily
		9-9	Daily Traverse Report (Field Geological Survey)	o	Daily
		9-10	Well Daily Report	o	Daily
10	$C \rightarrow U_E$	10-1	Final Report (Seismic)	o	Per Survey
		10-2	Airborne Magnetic Survey Report	o	Per Survey

* Report number is for the convenience.

Flow No.	Data Flow Field Unit Pusat	Report* No.	Title of Report	Format Yes or No	Frequency
10	C → U_E	10-3	Final Report (Gravity)	o	Per Survey
		10-4	Core Analysis Report	o	Per Well
		10-5	Petrographic Analysis Report	o	Per Well and Survey
		10-6	Paleontrogical Report	o	Per Well and Survey
		10-7	Special Study Report	o	
		10-8	(Seismic) Statistical Report	o	Monthly
11	F_L → U_L	11-1	Monthly EPT Report	o	Monthly
		11-2	Well File	o	per well
		11-3	Field Volumetric Calculation Data	o	Yearly
		11-4	Oil Reserves	o	Yearly
12	F_P → U_P	12-1	Monthly Prod. Report	o	Monthly
13	F_D → U_D	13-1	Monthly Drilling Report	o	Monthly
14	F_T → U_T	14-1	Heavy Equip. Weekly Report	o	Weekly
		14-2	Weekly Tech. Activity Report	o	Weekly
		14-3	Monthly Tech. Report	o	Monthly
		14-4	Monthly Budget Proposed Control	o	Monthly
15	F_G → U_G	15-1	Field Gas Monthly Report	o	Monthly

* Report number is for the convenience.

EXHIBIT 3-1

DATA INFORMATION FLOW

EXHIBIT-3-1 DATA INFORMATION FLOW

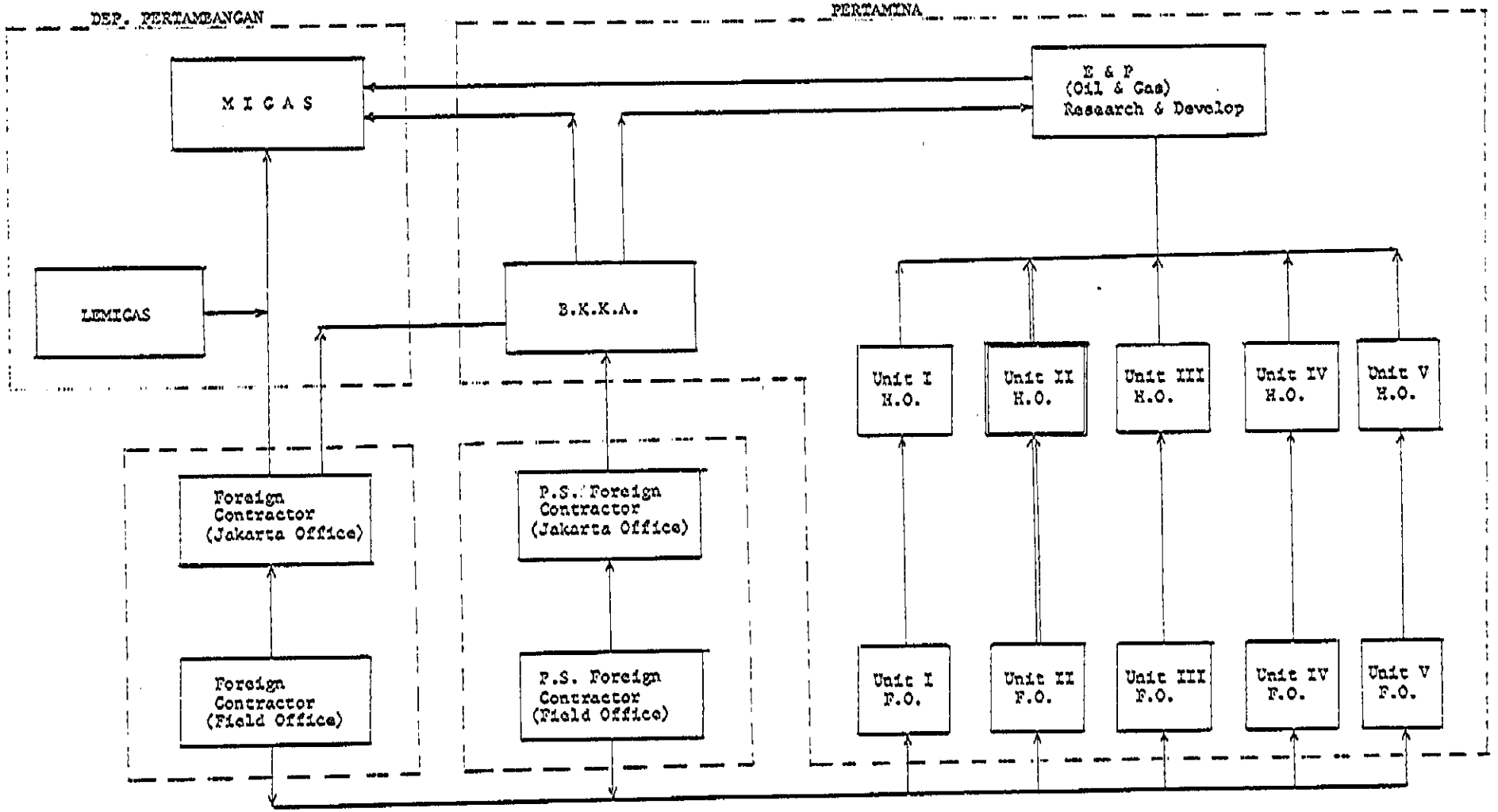
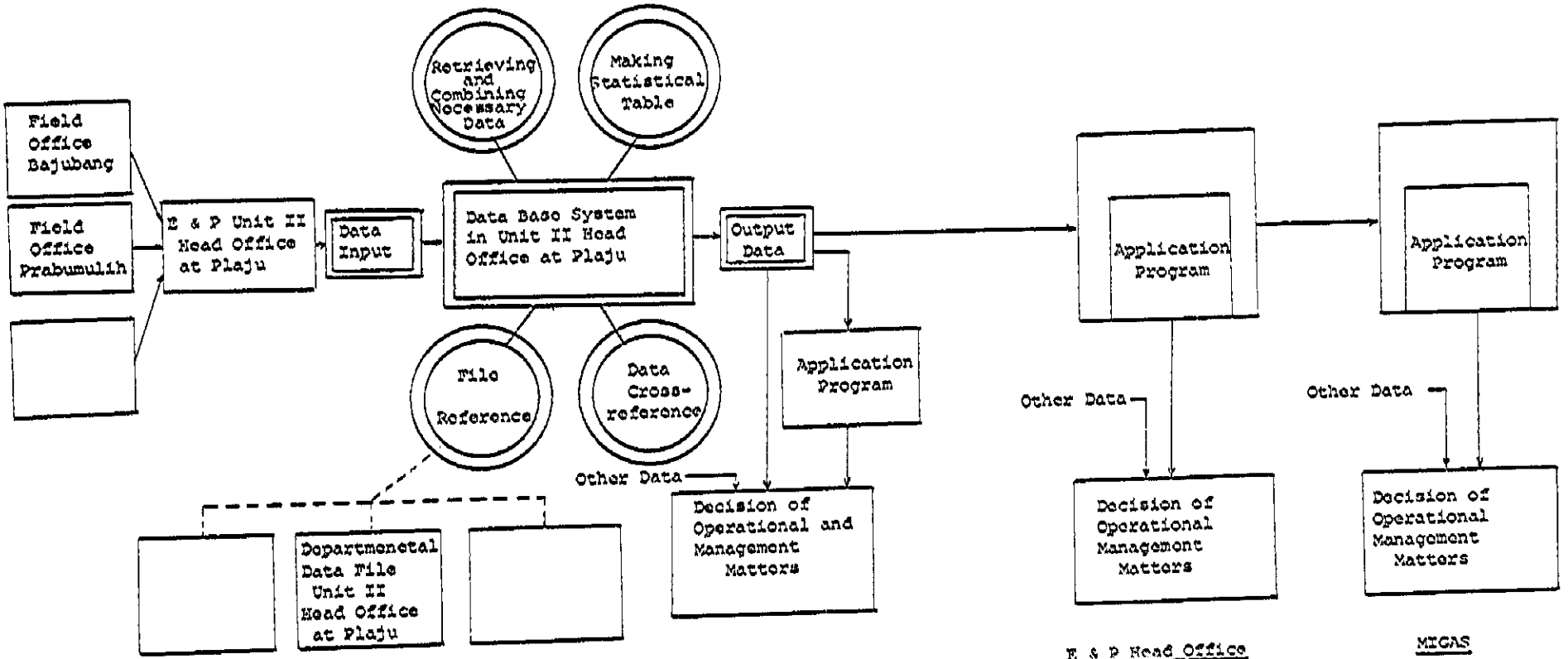


EXHIBIT-3-2

CONCEPTUAL DIAGRAM OF
DATA BANK SYSTEM IN UNIT II

EXHIBIT-3-2 CONCEPTUAL DIAGRAM OF DATA BANK SYSTEM IN UNIT II



1) To improve data transportation method between PERTAMINA Head Office E & P and Unit II Head Office and MIGAS and PERTAMINA Head Office E & P, items to be investigated will be recommended, after conceptual design of the Data Bank System.
2) By executing these functions in combinations, the items required for routine report making could be retrieved, new type reports as required be produced, necessary statistical table be prepared and file reference be made.

EXHIBIT-4

CONFIGURATION OF COMPUTER SYSTEM
IN PLAJU AS OF 1978

EXHIBIT-4 CONFIGURATION OF COMPUTER SYSTEM IN PLAJU AS OF 1978

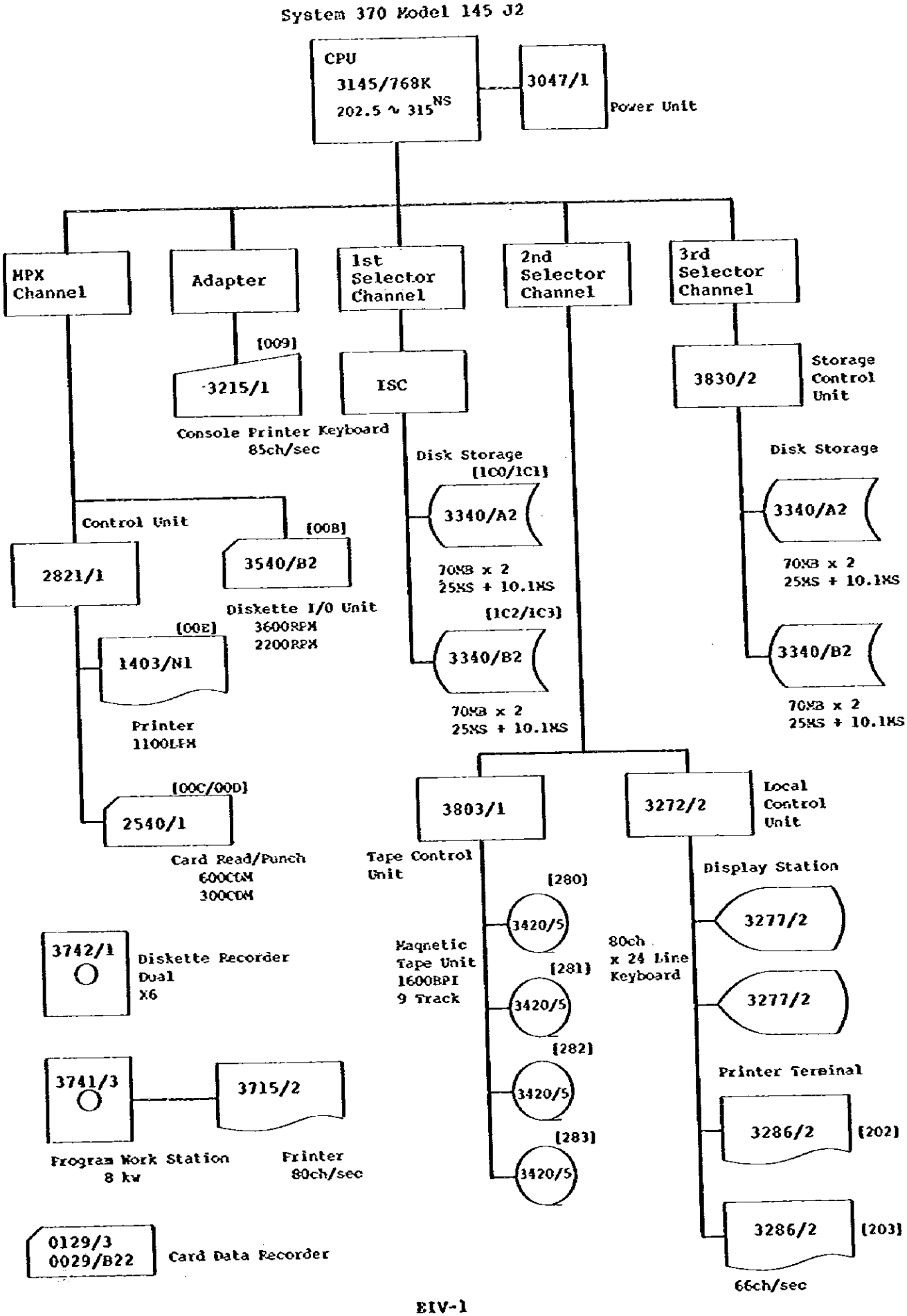


EXHIBIT-5

ITEMIZED PROCEDURE OF CONCEPTUAL DESIGN WORK FOR PETROLEUM EXPLORATION AND PRODUCTION DATA BANK SYSTEM OF PERTAMINA UNIT EP-II

1. Conceptual software design for data bank system

(1) Conceptual design of output format and method

1) Settlement and classification of output data

2) Settlement of key word for retrieving output item

3) Concepting output method and procedure

(2) Conceptual design of identification code

1) Settlement of code item

2) Concepting code system

(3) Conceptual design of input format and method

1) Determination of data form and number of column

2) Determination of data tree

3) Frequency of occurance and volume of input data

4) Determination of data item to be checked

5) Concepting method for data check processing

6) Concepting method and procedure of data entry

(4) Conceptual design of table and file

1) Settlement of table, data file and work file

2) Settlement of file organization and file access method

3) Concepting procedure of creation and updating of file

4) Concepting procedure of creation of backup file

5) Concepting procedure of file maintenance

6) Concepting relationship between data group and file

7) Concepting memory size of table and file

8) Concepting file management

(5) Examination on feasibility of utilization of information management system (IMS)

(6) Conceptual design of data processing flow

1) Preparing flowchart for data processing

2) Concepting processing message and error message

3) Concepting error list, proof list and confirmation list

4) Forcasting of processing time

(7) Conceptual design of program for data bank system

1) Examination on feasibility of utilization of utility program

2) Determination of computer language

3) Concepting kind, number and size of program for data bank system

4) Constituent of program for data bank system

2. Recommendation on Processing unit of computer system

(1) Recommendation on output processing unit

(2) Recommendation on data entry processing unit

(3) Recommendation on memory system

(4) Drawing of a blue print for future plan

3. Concepting method for introduction and handling of data bank system

EXHIBIT-6

ITEMIZED PROCEDURE OF DETAILED DESIGN WORK FOR PETROLEUM EXPLORATION AND PRODUCTION DATA BANK SYSTEM OF PERTAMINA UNIT EP-II

1. Detailed software design for data bank system

(1) Detailed design of output format and method

1) Formatting of output report

2) Formatting of error list, proof list and confirmation list

3) Establishment of output data processing

(2) Detailed design of identification code

1) Formatting of code item

2) Establishment of code system

(3) Detailed design of method for input data processing

1) Design of input data sheet for data bank system

2) Establishment of method for data check processing

3) Establishment of method for data entry processing

(4) Detailed design of table and file

1) Determination of specification of table and file

2) Preparation of data layout form in table and file

3) Preparation of allocation map of table and file

4) Determination of constituent of table and file

(5) Establishment of data processing flow

(6) Detailed design of program

1) Preparation of program list

2) Determination of function and constituent of program

3) Preparation of block diagram for program

4) Determination of table and file to be utilized in program

5) Determination of input and output item for program

6) Determination of variable data and area for program

7) Settlement of parameter, swich function and counter function in program

8) Instruction for message function of program

9) Instruction for coding rule

2. Establishment of debugging and test procedure

(1) Instruction for test item

(2) Instruction for debugging and test procedure

EXHIBIT-7-1

ESTIMATED MANPOWER FOR ESTABLISHMENT OF
PETROLEUM EXPLORATION AND PRODUCTION
DATA BANK SYSTEM OF PERTAMINA UNIT EP-II

EXHIBIT-7-1 ESTIMATED MANPOWER FOR ESTABLISHMENT OF PETROLEUM EXPLORATION AND PRODUCTION DATA BANK SYSTEM OF PERTAMINA UNIT EP-II

Phase I System Design

1. Conceptual System Design

(1) Preparation of report of conceptual system design

Qualification		Man-month	Remarks
Geophysicist	1 person	3.0	- Conceptual design of input format and output format - Preparation of report
Geologist	1 person	3.5	- Conceptual design of input format and output format - Preparation of report - Planning of introduction and handling (if in case of senior)
Drilling Engineer	1 person	3.0	- Conceptual design of input format and output format - Preparation of report
Petroleum Engineer	1 person	2.0	- Directing and managing all project in case of project leader
Reservoir Engineer	1 person	3.0	- Conceptual design of input format and output format - Preparation of report
Mechanical and/or Process Engineer	1 person	3.0	- Conceptual design of input format and output format - Preparation of report
System Analyst	2 persons (one person should be a senior class)	10.5	- Conceptual design of input method and output method, and output method, identification code, table and file, data processing flow and programs. - Examination on feasibility of utilization of Information Management System (IMS) - Concepting method for introduction and handling of the Data Bank System - Planning of manuals - Preparation of report
Computer Hardware Engineer	1 person	3.0	- Recommendation on processing unit of computer system - Preparation of report
		31.0	

Note: One of the above experts should have the qualification to act as a leader or manager and more than a half of the remains are desired to have the qualification of senior class.

(2) Presentation to the Indonesian users

Qualification		Man-month
Geophysicist	1 person	1.0
Geologist	1 person	1.0
Drilling Engineer	1 person	1.0
Petroleum Engineer	1 person	1.0
Reservoir Engineer	1 person	1.0
Mechanical and/or Process Engineer	1 person	1.0
System Analyst	1 person	1.0
Computer Hardware Engineer	1 person	1.0
		8.0

Note: One of the above experts should have the qualification to act as a leader or manager and more than a half of the remains are desired to have the qualification of senior class.

2. Detailed System Design

(1) Preparation of report of detailed system design

Qualification		Man-month	Remarks
Geophysicist	1 person	1.0	- Detailed design of output format and code - Justification and evaluation of designed system - Preparation of report
Geologist	1 person	1.0	- Detailed design of output format and code - Justification and evaluation of designed system - Preparation of report
Drilling Engineer	1 person	1.0	- Detailed design of output format and code - Justification and evaluation of designed system - Preparation of report

Petroleum Engineer	1 person	1.0	- Directing and managing all project in case of project leader
Mechanical and/or Process Engineer	1 person	1.0	- Detailed design of output format and code - Justification and evaluation of designed system - Preparation of report
Reservoir Engineer	1 person	1.0	- Detailed design of output format and code - Justification and evaluation of designed system - Preparation of report
System Analyst and/or System Engineer	4 persons (2 persons should be senior class)	20.0	- Detailed design of method for output and input data processing - Detailed design of table, file and programs - Establishment of data processing flow - Establishment of debugging and test procedure - Preparation of report
		26.0	

Note: One of the above experts should have the qualification to act as a leader or Manager and more than a half of the remainds are desired to have the qualification of senior class.

(2) Presentation to the Indonesian users

Qualification		Man-month
Exploration Engineer	1 person	1.0
Petroleum Engineer	1 person	1.0
Reservoir Engineer	1 person	1.0
System Analyst	1 person	1.0
		4.0

Note: At least three of the above experts should be a senior class.

Phase II Computer Application to the Data Bank System

(1) Programming, debugging and test

Qualification		Man-month	Remarks
Senior System Analyst	2 persons	9.5	- Description of the detailed processing step of program and subprogram - Preparation of test data - Preparation of manual
System Analyst	2 persons	12.0	- Description of the detailed processing step of program and subprogram - Coding - Debugging and test - Preparation of manual
Programmer	3 persons	18.0	- Description of the detailed processing step of program and subprogram - Coding - Debugging and test
		39.5	

(2) Introduction of the Data Bank System to computer system

Qualification		Man-month
Senior System Analyst	1 person	2.0
System Analyst	1 person	2.0
System Operation Engineer	1 person	2.0
Programmer	1 person	2.0
		8.0

Phase III Assistance for Preparation of Input Data

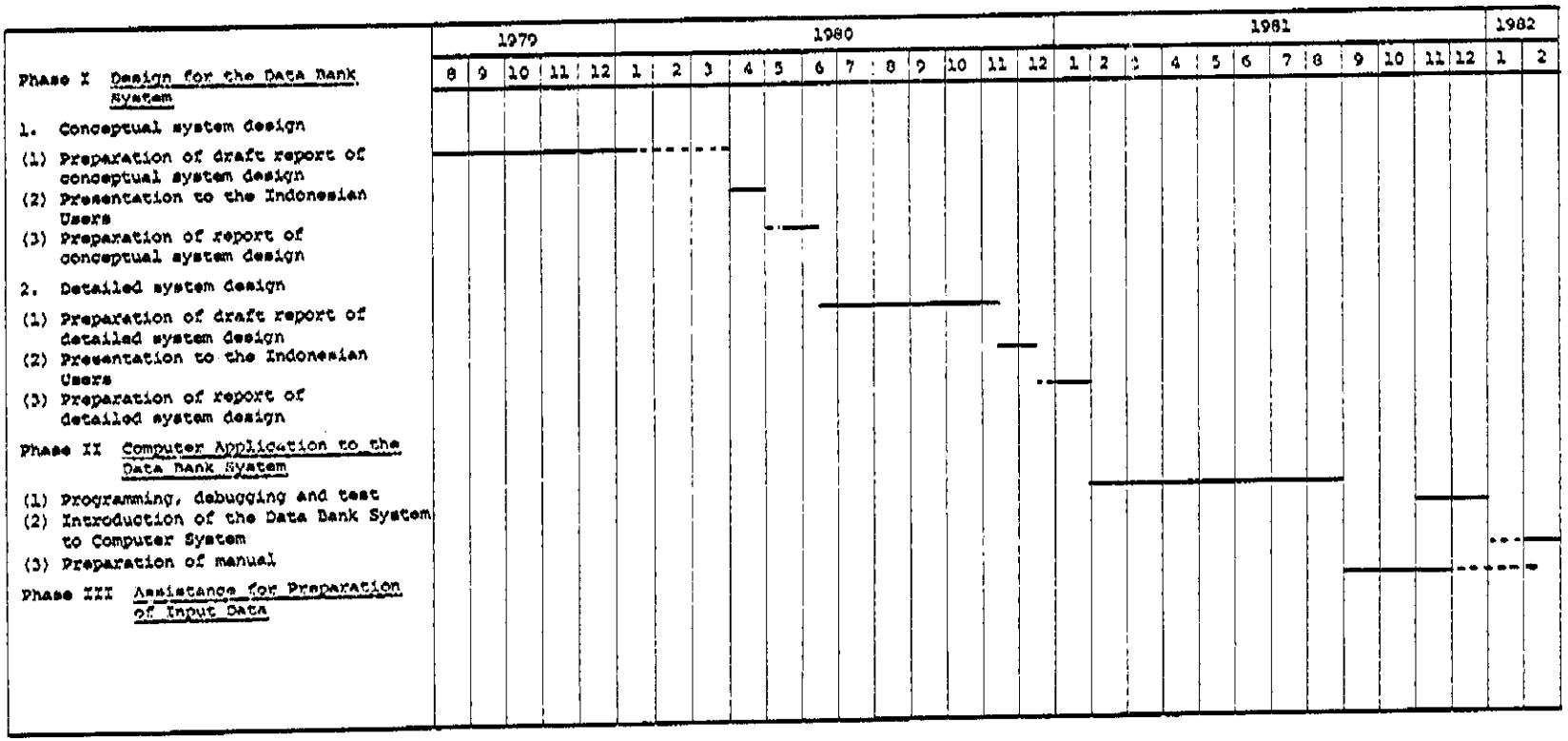
Qualification		Man-month
Exploration Engineer (geophysicist or geologist)	1 person	3.0
Drilling Engineer	1 person	3.0
Petroleum Engineer (assumed to act as a coodinator)	1 person	1.0
Reservoir Engineer	1 person	3.0
Mechanical and/or Process Engineer	1 person	3.0
System Analyst	1 person	1.0
		14.0

Note: More than a half the above experts are desired to be a senior class.

EXHIBIT-7-2

WORK SCHEDULE FOR ESTABLISHMENT OF PETROLEUM EXPLORATION AND PRODUCTION DATA BANK SYSTEM OF PERTAMINA UNIT EP-II

EXHIBIT-7-2 WORK SCHEDULE FOR ESTABLISHMENT OF PETROLEUM EXPLORATION AND PRODUCTION DATA BANK SYSTEM OF PERTAMINA UNIT I-V



LIST OF ANNEX

ANNEX-1

MINUTES OF MEETINGS ON SURVEY FOR SETTING UP OF THE PETROLEUM EXPLORATION AND PRODUCTION DATA BANK SYSTEM IN INDONESIA

ANNEX- 1

MINUTES OF MEETINGS ON SURVEY FOR SETTING UP OF THE PETROLEUM EXPLORATION AND PRODUCTION DATA BANK SYSTEM IN INDONESIA

TABLE OF CONTENTS

LIST OF FIGURE

LIST OF ATTACHMENT

MINUTES OF MEETINGS ON SURVEY FOR SETTING UP OF THE PETROLEUM EXPLORATION AND PRODUCTION DATA BANK SYSTEM IN INDONESIA

I. GENERAL

A mission from the Japan International Cooperation Agency (JICA), headed by Mr. Daishiro Kasahara, leader of the Japanese survey team for the development of the Petroleum Exploration & Production Data Bank System in Indonesia (the Data Bank Project), discussed the following matters with Mr. Trisulo, Director of Exploration and Production of the Perusahaan Pertambangan Minyak dan Gas Bumi Negara (PERTAMINA), and the Indonesian counterpart, headed by Mr. M.A. Warga Dalem, Chairman of Departmental Team, Head Sub-Directorate of Planning & Management, Directorate of General Affairs of PERTAMINA, during the period between November 21 and December 22, 1978 at the various offices concerned :

- The first stage of the Data Bank Project to be established, which is the establishment of original source data filing system.
- Collection of information related to the first stage of the Data Bank Project.

Participants of the meetings and record of activities performed by the Japanese survey team are enclosed as Attachment I and Attachment II respectively.

The objective of the Japanese survey team was to discuss the requirements and scope of the Data Bank Project and to collect the information required for preparing the master plan of the implementation of the first stage of the Project.

A letter was dispatched on November 27, 1978 (Attachment III-1) from Mr. Daishiro Kasahara to Mr. Warga Dalem, officially requesting to provide the Japanese survey team with information required.

The letter was responded on December 2, 1978 (Attachment III-2) expressing the Indonesian team's complience under the condition that secrecy of the information should be guaranteed and MIGAS & PERTAMINA have the right to withhold any information irrelevant to the Data Bank Project. This letter was accepted and signed by Mr. Daishiro Kasahara.

The Japanese survey team paid visits to MIGAS Office, LEMIGAS Office, PERTAMINA Head Office all located in Jakarta, PERTAMINA Field Offices in Prabumulih and Bajubang, and collected relevant information related to the project as listed in Attachment IV.

After further discussion at PERTAMINA Head Office in Jakarta and PERTAMINA Unit II Head Office in Plaju, the team was divided into three subteams : for exploration, for engineering and for computer system respectively.

Three members of the Japanese survey team visited the field office at Bajubang and all members visited the field office at Prabumulih afterwards.

During the discussion held in the various places stated in Attachment II, better understanding on the Data Bank Project was reached between both sides on the findings of the preliminary survey of the Energy Data Bank Project, made during the period between February 28 and March 12, 1978. Reference is made to Attachment V "MINUTES OF DISCUSSIONS AT PLAJU".

II. THE DATA BANK SYSTEM FOR THE FIRST STAGE

During the survey, requirements related to the Data Bank System for the first stage have been discussed and elaborated. The Japanese survey team and their Indonesian counterpart agreed as follows :

1. The Data Bank System will be installed at Unit II, Head Office Plaju.
2. The data base for the Data Bank System should include data related to the exploration and production of PERTAMINA's operational area of Unit II. For the time being, gas and oil fields earmarked for the Data Bank System are listed in Appendix-II of Attachment-V.
3. Language to be utilized in the Data Bank System will be English.
4. The Data Bank System to be established at Unit-II Head Office should be consistant with the coding and indexing system in the Integrated Filing System within PERTAMINA.
5. The Data Bank System should be designed in th manner of integrating the separate satellite data filings which will be further computerized or microfilmed, independently of the Data Bank System.
6. Items to be stored in the data base of the Data Bank System will be properly proposed in middle of June, 1979 taking into consideration the requirements and the information discussed and collected by the Japanese survey team. However, the data base should be designed in the manner of storing as much as possible the following items as requested by the Indonesian counterpart :
   a. Items as shown in Appendix-IV of Attachment-V.
   b. Information related to specific reports, well files and periodical reports.
   c. Input items in the application programs as shown in Appendix-V of Attachment-V.

7. The data base for the Data Bank System should have historical data as described in Appendix-III of Attachment-V.

8. The Data Bank System should be designed to function as the separate satellite module in the integrated data bank system for PERTAMINA and MIGAS as a whole, to be established in the future.

9. Although second priority, efforts should still be paid to incorporate the following items in Attachment-IV into the data base as much as possible :

   a. Items in "OUTPUT GEOLOGI YANG DIINGINKAN"

   b. Input items of application programs utilized at E & P PERTAMINA Head Office.

   c. Input items of O.A.R.S. programs owned by MIGAS.

   d. MIGAS Regulation.

10. System design study for the Data Bank System should be made, at first, with the feasibility of utilizing the Information Management System (IMS), which is currently used at the Computer Center of PERTAMINA Head Office in Jakarta, and will be transferred in due time to computer Center of Unit II Head Office at Plaju.

11. Data flow in the computer system is confirmed by the figure in Appendix-VII of Attachment-V. Design of computer system should be made fundamentally based on the figure describe above. However, some modifications will be expected to meet the Data Bank System requirements. Modifications will depend upon the volume and type of data obtained after analysis of the information collected.

12. The Data Bank System should be designed so as to have versatility for modification to be expected.

III. INDONESIAN DESIRES OTHER THAN THE DATA BANK SYSTEM

In the course of the survey in Indonesia made by the Japanese survey team, some desires indirectly relevant to the Data

Bank System for the first stage have been indicated by their Indonesian counterpart.

Those have been recognized by the Japanese survey team as follows :

1. The establishment of the Integrated Filing System of PERTAMINA.
   Data of each department at Unit EP-II Head Office are filed in different manners according to their respective coding and indexing system. This has prevented computerization and microfilming of the data stored in each department.
2. Equipment of more shopisticated application programs.
3. Microfilming of document and maps.
4. Introduction of retrieval system on microfilm data of PERTAMINA Unit-II Head Office to the Data Bank System.
5. Improvement of currently applied computerized system for drilling operation.
6. Improvement of the collecting system of data related to the Technical Department of Unit EP-II Head Office.
7. Standardization of monthly and yearly reports from PERTAMINA Unit-II Head Office to PERTAMINA Head Office in Jakarta.
8. Technology transfer of Information Management System (IMS) from Computer Center of PERTAMINA Head Office in Jakarta to Computer Center of PERTAMINA Unit-II Head Office at Plaju in due time.
9. Introduction of data communication system between Field Office, Head Office in Area-II and Head Office in Jakarta.

IV. CLOSING.

Japanese survey team expressed its heartiess gratitude for full assistance and the kindest cooperation of their

Indonesian counterpart to Mr. Wijarso, Director General of Oil & Gas (MIGAS), Departemen Pertambangan, and Mr. Trisulo who had been called on by the Japanese survey team.

Jakarta, December 22, 1978.

D. KASAHARA
Team Leader, JICA.

M.A. WARGA DALEM
Chairman, Departmental Team.

Fig. 1 DATA INFORMATION FLOW

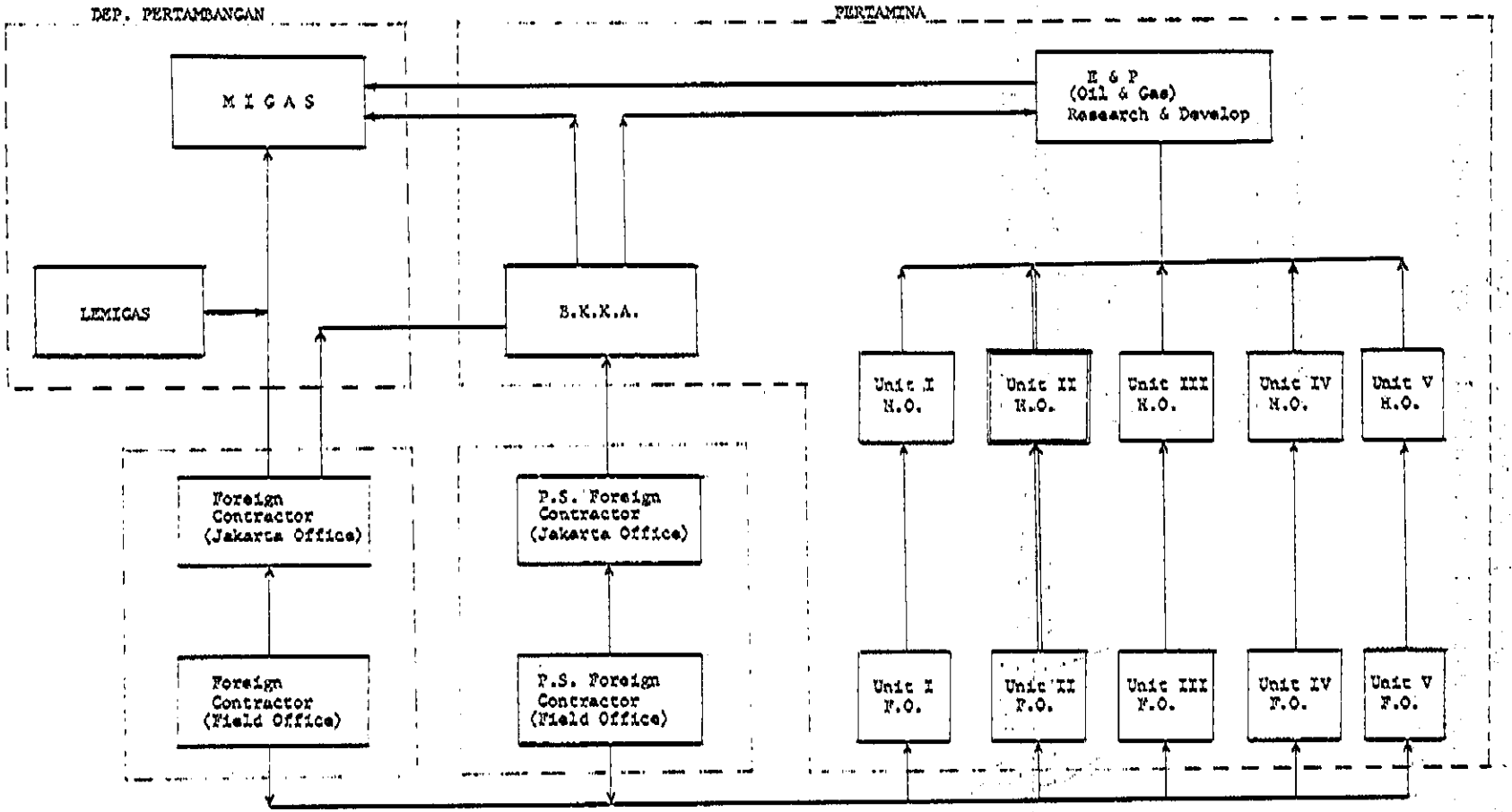
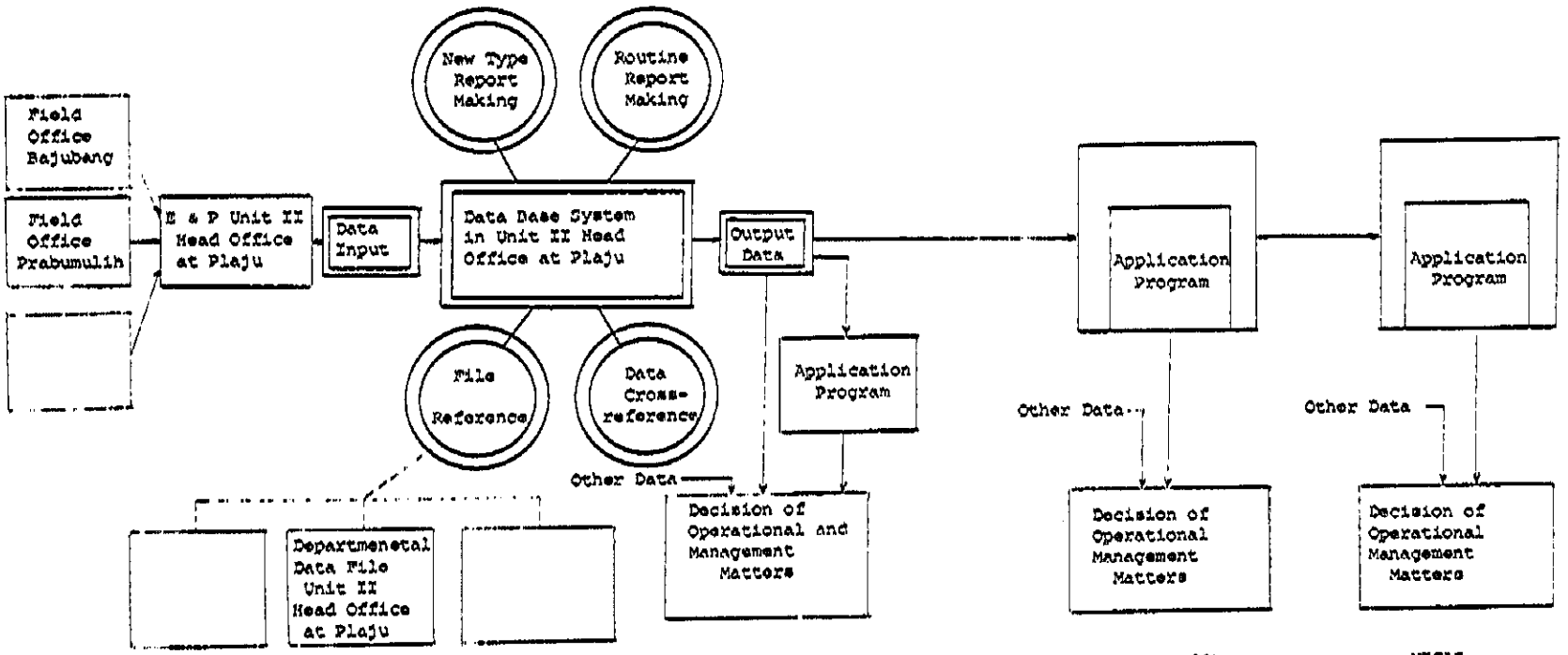


FIG. 2. CONCEPTUAL DIAGRAM OF DATA BANK SYSTEM IN UNIT II



To improve data transportation method between PERTAMINA Head Office E & P and Unit II Head Office and MIGAS and PERTAMINA Head Office E & P, items to be investigated will be recommended, after conceptual design of the Data Bank System.

ATTACHMENT - I

ATTENDANT LIST IN INDONESIA

ATTACHMENT I

Attendant List in Indonesia

1. Indonesia Side

			subteam
1) Jakarta			
WARGA DALEM	Chairman	(PERTAMINA)	
B.S. SITOEHORANG	Team Leader	(PERTAMINA)	
ROHALI SANI		(MIGAS)	
M. THAMRIN	Subteam Leader, Geologist	(PERTAMINA)	I
B. SUTARSO	Geologist	(PERTAMINA)	I
SOEPRAPTONO	Geologist	(MIGAS)	I
P. MANALU	Geologist	(MIGAS)	I
SUBIJANTO	Geologist	(LEMIGAS)	I
SUHEIMI NURUSMAN	Geophysicist	(LEMIGAS)	I
HEROE SOEBARKAH		(MIGAS)	I
AULIA SIAGIAN	Subteam Leader, Reservoir Eng.	(PERTAMINA)	II
HIDAYAT	Petroleum Eng.	(MIGAS)	II
NAISALI. P.	Petroleum Eng.	(MIGAS)	II
FADRULSJAH. J.	Petroleum Eng.	(LEMIGAS)	II
ESTU BAGYO	Petroleum Eng.	(LEMIGAS)	II
MAMAN WIDJAYA	Subteam Leader	(PERTAMINA)	III
KUSMARTONO	Electrical Eng.	(LEMIGAS)	III
MULJANTO	System Analyst & Mathematicien	(MIGAS)	III
ESTI SUGIANTO	System Analyst	(PERTAMINA)	III

subteam

AGUNG WITONO	Data Base Administrator	(PERTAMINA)	III
B. BUDIJONO	System Analyst	(PERTAMINA)	III
ERNI MUTHALIB	System Analyst	(PERTAMINA)	III
BROERIE SUPUSEPA	System Programmer	(PERTAMINA)	III
HEUDRISIE SOEPRAPTO	Data Base Administrator	(PERTAMINA)	III

2) Area II

Refer to appendix I of attachment V.

2. Japan Side

1) JICA

D. KASAHARA	Team Leader, Petroleum Eng.	
H. TAKIZAWA	Geologist	I
A. SHIBUYA	Geophysicist	I
M. EZOE	Mechanical Eng.	II
H. KUSANO	Drilling Eng.	II
T. INAMORI	Reservoir Eng.	II
H. ISONO	System Analyst	III
H. HASHIMOTO	Computer Hardware Eng.	III
T. TANAKADATE	Coordinator	
M. SUEMORI	Coordinator	

2) EMBASSY

S. KANDA	EMBASSY OF JAPAN

ATTACHMENT - II

RECORD OF ACTIVITIES PERFORMED BY JAPANESE SURVEY TEAM IN INDONESIA DURING THE PERIOD BETWEEN NOV. 20TH AND DEC. 23RD, 1978

ATTACHMENT II

Record of Activities Performed by
Japanese Survey Team in Indonesia
during the period between Nov. 20th and Dec. 23rd, 1978

Date	Subject concerning the Survey
Nov. 20th	Tokyo to Jakarta. Internal Meeting at President Hotel.
Nov. 21st	Meeting at Japanese Embassy, Jakarta, - Discussion of survey schedule in Indonesia Plenary Meeting at PERTAMINA E & P Head Office. - Opening session of the meeting, and Introduction of the Indonesian counterpart team by Mr. Walga Dalem. - Explanation of the scope of work related to the survey by Mr. D. Kasahara. - Introduction of the members of the Japanese Survey Team. - Discussion of the survey schedule and survey methods. Courtesy Call on Mr. Trisulo (Director of PERTAMINA E & P) - Introduction of the scope of work for the survey. Internal Meeting at President Hotel.
Nov. 22nd	Plenary Meeting at PERTAMINA E & P Head Office,Jakarta. - Discussion of the survey method, Japanese Survey Team and Indonesian counterpart team were divided into three subteams as follows: . Subteam I : Exploration group . Subteam II : Engineering group . Subteam III : Computer group

Subteam Meeting.

- Subteam I.
  - . Hearing of the organization of Exploration Department of PERTAMINA E & P.
  - . Hearing of main reports, reporter and report preparation method.

- Subteam II.
  - . Hearing of the organization and data flow system of PERTAMINA E & P.
  - . Hearing of relationship between PERTAMINA and MIGAS.

- Subteam III.
  - . Discussion of survey plan.
  - . Hearing of currently utilized application programs of PERTAMINA E & P and MIGAS.

Internal Meeting at President Hotel.

Nov. 23rd Subteam Meeting at PERTAMINA E & P.

- Subteam I.
  - . Discussion of data flow system of Exploration Department.
  - . Listed up the main reports of Exploration Department.
  - . Discussion of the requirement of Exploration Department.

- Subteam II.
  - . Hearing of the organization of Production, Exploitation and Drilling Department of PERTAMINA E & P.
  - . Hearing of the contents of Well File.

- Subteam III.
  - . Collection of the input items of OARS.
  - . Observation of computer system S/370 and S/1130.

Internal Meeting at President Hotel.

Nov. 24th Subteam Meeting.

- Subteam I.
  . Hearing of the detail contents of the periodical reports and specific reports prepared by Exploration Department.

- Subteam II.
  . Requested to provide with information related to the project as the first phase of the survey.

- Subteam III.
  . Collection of input data sheet of PERTAMINA application programs.
  . Hearing of OARS System.

Nov. 25th All the members of Japanese Survey Team visited to MIGAS.

. Hearing of MIGAS organization.
. Surveyed MIGAS's requirements for the Data Bank System.

Nov. 26th Internal Meeting at President Hotel.

Nov. 27th Plenary Meeting at PERTAMINA E & P.

- Handed the letter, addressed to Mr. Warga Dalem from Mr. D. Kasahara, to Mr. B.S. Sitoemorang.
- Discussion of the data, reports and information required in the letter.

Subteam Meeting.

- Subteam II.
  . Visited drilling department PERTAMINA E & P for discussion of related matters.

- Subteam III.
  . Hearing of OARS System.

Nov. 28th Subteam Meeting.

- Subteam I.
  . Hearing of the items in the specific reports.

- Subteam II.
  . Confirmation of the organization of Exploitation and Production Department.

All the members of Japanese Survey Team visited LEMIGAS.

- Hearing of the activities and function of LEMIGAS.
- Observation of LEMIGAS Laboratory.

Nov. 29th Subteam Meeting.

- Subteam I.
  . Hearing of filing system, especially new filing system of Exploration Department of Jakarta.
  . Observation of the report storage of Documentation and Planning Department.

- Subteam II.
  . Hearing of the organization of Production Department.
  . Discussion of the "standard input items" which was presented by Japanese Survey Team.

- Subteam III.
  . Surveyed input items of currently utilized application program of PERTAMINA.
  . Hearing of current status concerning software of PERTAMINA.

Nov. 30th Plenary Meeting at PERTAMINA Head Office.

- Presentation of the example standard input items to be stored in the Data Bank System.
- Explanation of the concept of the Data Bank System by Mr. D. Kasahara based on the short write up memo which was distributed to the counterpart team.

Subteam Meeting.

- Subteam II.
  . Discussion of imput items related to Engineering group.

Dec. 1st Off duty.

Dec. 2nd Plenary Meeting.

- Received the letter addressed to Mr. D. Kasahara from Mr. Warga Dalem.
  The letter was signed by Mr. D. Kasahara.
- Settlement of Plaju survey schedule.

Subteam Meeting.

- Subteam II.
  . Discussion of method of data collection.
  . Requested to make arrangement for data collection during Plaju survey.

- Subteam III.
  . Discussion of the application programs of which input items are related to the Data Bank System.
  . Received the description of the computer hardware configuration of PERTAMINA.

Dec. 3rd Internal Meeting at President Hotel.

Dec. 4th Discussion of Plaju survey plan with B.S. Sitoemorang and Mr. Aulie.
Jakarta to Palembang (All member of Japanese Survey Team).

- Discussion of the Plaju survey schedule at Palembang airport lobby with Mr. Kamili.

Internal Meeting at Sandjaja Hotel (Palembang).

Dec. 5th Plenary Meeting at E&P Unit II Head Office.

- Opening session of the meeting by Mr. A. Hamid.

- Explanation of the background of the survey by Mr. B.S. Sitoemorang.
- Explanation of the purpose and progress of the survey by Mr. D. Kasahara.
- Introduction of both members concerning the survey by Mr. A. Hamid and Mr. D. Kasahara.
- Settlement of survey schedule in PERTAMINA Area II.

Subteam Meeting.

- Subteam I.
  . Discussion of a detail survey plan.
  . Discussion of data and reports required Japanese Team.
  . Hearing of the organization of Exploration Department.

- Subteam II.
  . Hearing of the organization of E & P Unit II Head Office.
  . Surveyed reporting system related to Exploitation, Production, Drilling and Technical Departments of Unit II Head Office.

- Subteam III.
  . Discussion of a detail survey schedule concerning subteam III.

Dec. 6th Subteam Meeting.

- Subteam I.
  . Selected the reports and data for collection.
  . Required to submit the example copies of the above report and data.
  . Hearing of the data filing system of Exploration Department.

- Subteam II.
  . Surveyed the kind of title of "Periodical Reports" related to Exploitation, Production, Drilling and Technical Departments.

. Hearing of contents of "Monthly Report of Producing Well".
. Surveyed the coding and indexing system of E & P.

- Subteam III.
  . Surveyed system, software and program packages of E & P Unit II
  . Surveyed hardware computer system of E & P Unit II.
  . Hearing of computer application other than E & P.

Dec. 7th Subteam Meeting.

- Subteam I.
  . Selected the reports and data for collection.
  . Hearing of filing system.
  . Observation of reports and data storing condition.

- Subteam II.
  . Surveyed contents and distribution of periodical reports and "Monthly Report of Producing Well".

- Subteam III.
  . Surveyed system, software and program packages.
  . Hearing of application software.

Internal Meeting at Sanjaya Hotel.

Dec. 8th Palembang to Bajubang (Mr. D. Kasahara, Mr. M. Ezoe and Mr. H. Takizawa).

- Explanation of the purpose of visiting Bajubang Field Office at Guest House.

Subteam Meeting at Plaju.

- Subteam I.
  . Surveyed filing system of reports and maps.

- Subteam II.
  . Discussion of the items to be stored in the Data Bank System.
  . Hearing of coding system related to specific report.

- Subteam III.
  . Surveyed description of input item of application programs.

- Palembang to Prabumulih (Mr. H. Isono and Mr. H. Hashimoto).

Dec. 9th At Bajubang.
- Surveyed report preparation method and kind of reports.
- Observation of production facilities of Bajubang oil field.

Subteam Meeting at Plaju.
- Subteam I.
  . Discussion of the filing system of Magnetic Tapes.
  . Hearing of the microfilmized data filing system.

- Subteam II.
  . Surveyed storing condition of Well File and specific report.
  . Surveyed filing system.

- Subteam III at Prabumulih.
  . Surveyed Dispatch Center of Gas Project.
  . Observation of Gas Compressing Center and Dehydration Plant.

Prabumulih to Palembang (Mr. H. Isono and Mr. H. Hashimoto).

Dec. 10th Bajubang to Palembang (Mr. D. Kasahara, Mr. M. Ezoe and Mr. H. Takizawa).

Internal Meeting at Sanjaya Hotel.

Palembang to Prabumulih (Mr. D. Kasahara, Mr. M. Ezoe, Mr. H. Takizawa, Mr. H. Kusano, Mr. T. Inamori and Mr. A. Shibuya).

Subteam Meeting.

- Subteam I.
  - . Observation of field seismic survey (Mr. Kasahara and Mr. Shibuya accompanied by Mr. Basuki).

- Subteam II.
  - . Hearing of organization of Field Office.
  - . Surveyed kinds of reports including Well File.
  - . Reports and data collection.
  - . Observation of rig site and production facilities.

- Subteam III.
  - . Surveyed input item of application software.

Prabumulih to Palembang (Mr. D. Kasahara, Mr. M Ezoe, Mr. H. Takizawa, Mr. H. Kusano, Mr. T. Inamori and Mr. A. Shibuya).

Internal Meeting at Sanjaya Hotel.

Dec. 12th Subteam Meeting.

- Subteam I.
  - . Received example copies of periodical report and specific report.
  - . Discussion of input items to be stored in the Data Bank System.
  - . Selected input items to be stored.

- Subteam II.
  - . Surveyed input items including Well File.
  - . Discussion of input items to be stored in the Data Bank System.

- Subteam III.
  . Discussion of data flow in the computer system.

Dec. 13th Internal Meeting at Sanjaya Hotel.

Subteam Meeting.

- Subteam I.
  . Discussion and selection of input items to be stored in the Data Bank System.
  . Discussion of data retrieval system.

- Subteam III.
  . Surveyed telecommunication system.

Dec. 14th Plenary Meeting at Unit II Head Office.
. Discussion the draft minutes.

Dec. 15th Plenary Meeting at Unit II Head Office.
- Singed on "Minutes of Discussion at Plaju by both teams.

Dec. 16th Internal Meeting at President Hotel.

Dec. 17th Internal Meeting at President Hotel.

Dec. 18th Subteam Meeting at PERTAMINA E & P Head Office,Jakarta

- Subteam - I
  Discussion of output items related to the Data Bank System.
- Subteam - III
  . Hearing of computer hardware configuration of PERTAMINA and future plan of computer hardware configuration of the Head Office in Jakarta.
  . Hearing of function of UCC-10 program package.
  . Hearing of the telecommunication line between Jakarta and Plaju relating to data communication.

Dec. 19th Internal Meeting at President Hotel.

Dec. 20th Proposed draft Minutes
- Discussion of the draft Minutes

Dec. 21st Finalized Minutes
signed on the Minutes.

ATTACHMENT - III

THE LETTERS

ATTACHMENT-III-1	THE LETTER DISPATCHED ON NOVEMBER 27TH, 1978 FROM MR. DAISHITO KASAHARA TO MR. WARGA DALEM
ATTACHMENT-III-2	THE LETTER DATED ON DECEMBER 2ND, 1978 FROM MR. WARGA DALEM TO MR. D. KASAHARA

ATTACHMENT-III-1

THE LETTER DISPATCHED ON NOVEMBER 27TH, 1978

FROM MR. DAISHIRO KASAHARA TO MR. WARGA DALEM

27 November 1978

To
Ir. Warga Dalem
Chairman of Indonesia
Counterparts

Dear Sir,

First of all, I extend my sincere compliments and would like to state that the data and copies of reports itemized in attached sheets herewith be requested to provide to us at your earliest convenience.

These have been realized to be necessary for preparing a master plan for the Data Bank System by our experts after their survey carried out during the period between the 21st and the 25th, November, 1978, with cooperation of your experts as counterparts.

The following informations have been already collected by our survey team during the aforementioned survey :

I. GENERAL

1. MIGAS Organization Chart
2. A copy of Petroleum & Natural Gas Industry of Indonesia, June, 1978.
3. A copy of the Government Regulation of the Republic of Indonesia Number 17 of 1974. Re. the Supervision of Oil and Natural Gas Exploration and Exploitation Activities in offshore area.

II. EXPLORATION

1. Organization of Exploration Department of PERTAMINA E & P, Unit II and Field Office.
2. Data flow concerning the geology and geophysics.
3. Requirement for output items concerning the Data Bank System (by Mr. Thamrin)
4. List of main reports of Exploration Department PERTAMINA E & P.
5. An example copy of notification to drill.

../2

III. ENGINEERING

1. General information of organization.

2. General information of data and reports flow.

3. General information of well file.

IV. DATA FILLING SYSTEM AND APPLICATION PROGRAM

1. MIGAS O.A.R.S. Input Forms

2. Data Sheet of Application Program in PERTAMINA BPD.

3. A copy of brief description of the O.A.R.S system.

V. COMPUTER SYSTEM

1. Information related to computer data input processing by diskette at BPD and seeing them.

2. Information related to Standalone 1130 computer system and its operation.

3. Seeing S/370 computer system at BPD.

In a process of our survey in Indonesia, it is expected for unveiled data and reports other than the above-mentioned to be disclosed and to be required to collect.

All the information will be used solely for the purpose of the data bank project and will not be released to other parties.

We hope you will give this your kindest and best consideration.

Best regards,

D. KASAHARA
Team Leader
Senior Petroleum Engineer
Japan International Cooperation Agency

cc.: Mr. B.S. Sitoemorang
Coordinator of Indonesian Counterparts

REQUIRED INFORMATIONS

I. General

1. PERTAMINA and MIGAS organization, (under request).

2. General conceptual map of Unit II PERTAMINA direct operation area, (under request).

3. Oil and gas fields to be stored in the Data Bank System, (under request).

4. Well status reports, 1972 - 1977, (under request).

II. Exploration

1. One copy of Yearly Progress Reports, 1972 - 1977, (under request).

2. Example copies of Monthly and Weekly Progress Reports.

3. One copy of following Specific Reports.
   1) Well Resume Report.
   2) Well (Drilling) Proposal.
   3) Gravity Report.
   4) Magnetic Report.
   5) Seismic Report.
   6) Paleontological Report, (including Foraminifera Pollen, Diatom, Mollusca and Plant).
   7) Field Mapping Report or Geological Report.

8) Special Study Report.
   . Log Analysis
   . Carbonate Study
   . Study Report, (Core Analysis).

4. Distribution list of Reports of PERTAMINA E&P and Unit-II Head Office (under request).

5. Currently applied filling system (Exploration).

6. Total number of following each Specific Report.

   1) Well Resume.

   2) Well (Drilling)Proposal.

   3) Gravity Report.

   4) Magnetic Report.

   5) Seismic Report.

   6) Paleontological Report, (Foraminifera, Pollen, Diatom, Mollusca and Plant).

   7) Field Mapping Report or Geological Report.

   8) Special Study Report.
      . Log Analysis
      . Carbonate Study
      . Study Report (Core Analysis).

7. Key personnel and stuffs of Exploration Department of Unit II.

III. Engineering

1. Organization of Drilling Department and Production Section and Exploitation Section of Production Department in PERTAMINA E&P.

2. Organization of Drilling, Production and Exploitation Development of Unit II Head Office.

3. Organization of Drilling, Production and Exploitation Development of Field Offices.

4. Data and Report Flow (Bejubang and Prabumulih Field Office to Plaju, and Plaju to Jakarta).

   1) Example Copies of Periodical Drilling Activity Report (Daily, Weekly, Monthly and Yearly).

   2) Example Copies of Periodical Activity Report (Daily, Weekly, Monthly and Yearly).

   3) Example Copies of Well Files (including following information).

      - Drilling Program
      - Completion Program
      - Weekly Drilling Report
      - Completion Summary
      - Workover Summary
      - Tubing
      - Casing
      - Bit
      - Mud
      - Core
      - Cutting
      - DST
      - FIT
      - Flow Test
      - Pressure Survey
      - Temperature Survey
      - Sampling
      - Deviation Survey
      - Cementing

- Perforation
- Logging
- Geological Marker
- Objective Zone
- Stimulation
- Fluid Analysis
- Artificial Lift
- Production Record
- Others

4) Example Copies of Specific Reservoir Data Book.

5) Example Copies of Specific Engineering Report (including following Information);

- Reserves Estimate
- Production Forecast
- Reservoir Evaluation

6) Example Copies of Specific Geological Report.

7) Example Copies of Periodical Production Report (Daily, Weekly, Monthly and Yearly).

8) Example Copies of Production Activity Report (Daily, Weekly, Monthly and Yearly).

9) Example Copies of Specific Engineering Report (including following Information);

- Artificial Lifting Study
- Production Allocation Study

10) Example Copies of Production Program.

11) Example Copy of Monthly Production Summary by Fields.

12) Example Copy of Monthly Gas Production and Utilization.

13) Example Copy of Monthly Gas Delivery to Pusri Fertilizer Plant.

14) Example Copy of Monthly E & P Progress Report
- Jambi (Bejubang field office)
- S. Sumatra (Prabumulih field office)

15) Example Copy of Drilling & Workover Program.

16) Example Copy of Monthly Calculation of Oil Flow.

17) Example Copy of Monthly Calculation of Gas Flow.

18) Example Copy of Monthly Report Producing Well.

19) Example Copy of Final Well Report.

5. Currently Applied Data Filling System

1) Code (Under reques).
- Unit Code (Unit II)
- Field Office Code
- Field Code
- Reservoir Code
- Well Code

2) Statistics of Report Circulation.

3) Distribution Chart (Distributor) Related to the Data and Reports described in Items 4 and 5.

6. Information Related to Process Flow and Equipment.

1) Organization for maintenance and construction at E & P, Unit II and Field Office.

2) Job content for each above-mentioned section.

3) Data flow about maintenance and construction information.

4) Data and report for each data flow.
- All facility plot plans in Unit II
- All process flow sheets in Unit II
- Name, frequency and format of each data and report.
- Process equipment information including :

- Each format of process equipment specification
- Meaning of process equipment Tag No.
- Some examples of process equipment history and equipment inventory
- Number of main process equipment in Unit II

5) Future plan and requirement for data bank system

- Required infromation to be stored in data bank system
- Storing period of each data and report to be stored.

IV. Data Filing System and Application Program

1. Data Filing System

1) Coding System.

2) Estimate data volume related to each data item concerning Unit II PERTAMINA direct operation area.

3) Storing location of each data which is filled according to coding system.

2. Application Program

1) Information of Key Items of input data for the programs in Oil Activity & Revenue System.

2) Data sheet for application programs in PERTAMINA Head Office, of which some have been received on November 24, 1978, (Under request).

3) Information of Key Items of input data for the programs in PERTAMINA Head Office.

4) Data sheet for application programs in PERTAMINA Field Office.

3. Software Related to Computer System in PERTAMINA Head Office and Unit II (under request).

   1) Operating system.

   2) Computer language.

   3) Program products, packages and utilities.

   4) Other software.

4. Future Plan of Software.

   1) Policy and plan related to Data Base Management system in PERTAMINA.

V. Computer System

The next items are under request.

1. Hardware Configuration.
   The next information of the locations at BPD (Computer Center) and each Unit (I - V).

   1) Type, speed, capacity, using number, unit number and their relation as shown in the attached sheet.

   - Central Processing Unit (CPU),
   - Console printer keyboard
   - Disk storage and control
   - Card reader and punch
   - Line printer
   - Diskette reader
   - Teleprocessing equipments
     Communication controller,
     Data terminal
   - Others
     X-Y plotler
     Local terminals, type and relation

   2) Computer room layout and electric power.

- Layout
- Store house : MT, Disk pack
- Electric power: voltage, Helz, capacity

3) Future Plan and Requirements.

- Hardware configuration
- Terminal allocation

2. Data Input System at BPD and Unit II.

1) Data input equipments : type, using number and allocation

- Diskette
- Data terminal
- Card
- Others

2) Operators

- Number
- Speed : touch/day on data and character input (average)
- Training

3) Data Input Job Flow

- Transportation or communication

4) Future Plan and Requirements

- Hardware
- Operators
- Terminal allocation

3. Data Output System at BPD and Unit II.

1) Volume of Periodic Report.

- Number of forms, volume/form
- Total volume (Total sheets on the period (frequency).

2) Data check system : organization responsibility.

3) Future plan and requirements.
   - Hardware
   - Location

4. Data Communication at BPD and Unit II.

1) Communication Line.
   - Organization which treats communication
   - Available data communication line and type area, route and quality
   - Technical standards or laws
   - Erecting procedure
   - Time required to erect
   - Available terminals (MODEM, NCU etc).
   - Erection cost and running cost

2) Data terminals at BPD and Unit II.
   - Available data terminals

3) Computer System of data communication.
   - Hardware configuration (controller and terminals)
   - communication access method, communication type application system in S/370 (OS and others)

4) Future Plan and Requirements.
   - Communication line
   - Data terminals
   - Computer system

5. Operation and Maintenance at BPD and Unit II.

1) Turn around time.

2) Computer operation.
   - Working hour and computer load
   - Outline of types and volume of computer work

3) Maintenance Data.

- Times and frequency of the past computer failure
- Maintenance : number of engineers
  repairing time of the past troubles
  organization of vendors

4) Hardware Purchase.

- Rental or purchase
- Buying route or procedure
- Technical standard or guide-line
- Tax.

5) Future Plan and Requirements.

- Computer operation
- Maintenance

6. Organization of Data Processing Divisions

The organization of the next sections.

BPD (Computer Center)
Data processing area in each UNIT
Data base group in MIGAS
LEMIGAS
EL NUSA
Others

1) Staffs

System analyst, programmer, computer system operator, data input operators, maintenance staff (of computer section and hardware vendors)

2) Organization

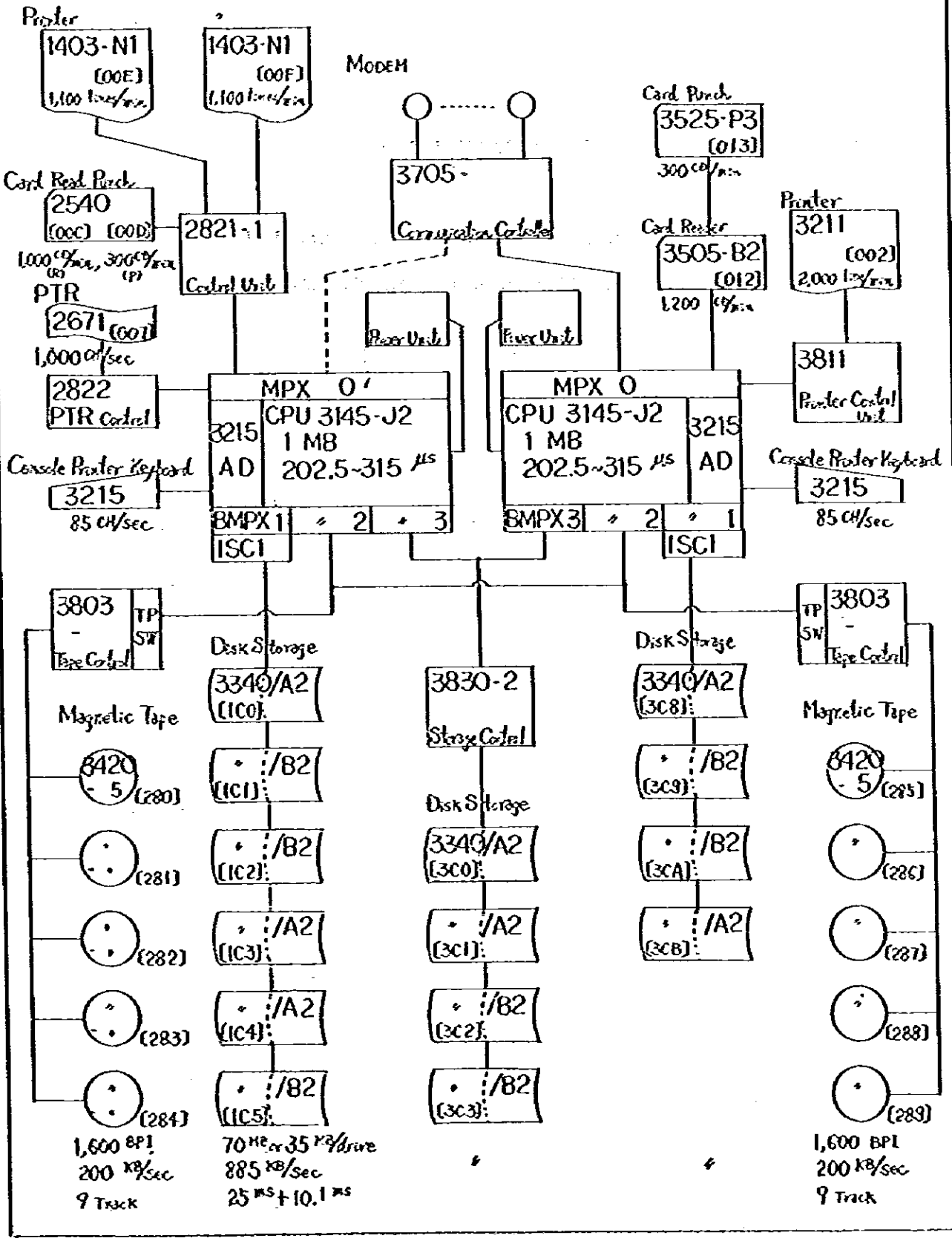
- Divisions and supervisors
- Role and relations to other divisions

3) Future Plan and organization.

PERTAMINA COMPUTER CENTER

System 370 Model 145
OS/VSI

Card Punch 129 set
Key to Diskette 3741- "
(D/S) 3742 "
Diskette to MT 3747 "



ATTACHMENT-III-2

THE LETTER DATED ON DECEMBER 2ND, 1978

FROM MR. WARGA DALEM TO MR. D. KASAHARA

PERUBAHAAN PERTAMBANGAN MINYAK & GAS BUMI NEGARA
(PERTAMINA)
HEAD OFFICE : JAKARTA (INDONESIA)
P.O. BOX 12 / JAKARTA

CABLE ADDRESS :
"PERTAMINA"

PHONE : 5531 – 553400

JAKARTA,
2 – 6, JL. PERWIRA

MESSRS

Mr. D. Kasahara
Team Leader Data Bank System
Japan International Cooperation Agency

OUR REF. :

ENCLOSURES :

SUBJECT : Data Bank Project

Dear Mr. Kasahara,

I received with great pleasure your letter of November 27, 1978 concerning the progress made by the Team in collecting the information needed in preparation for the establishment of the Data Bank System within the Department of Mines & Energy c.q. Migas and Pertamina.

Some of the information are readily available, while others have to be prepared in the format as required by your Team.

Therefore, in order to comply with your request for further access to our data file, with some of their containing unveiled data and reports, we would like to restress the followings :

1. all the information obtained by any Member of the Team will only be used solely for the purpose of the Indonesian Data Bank Project and will not be released to other parties
2. Migas & Pertamina have the right to with-hold any information requested by any Member of your Team which they regard as being irrelevant to the Data Bank Project. Any refusal should not effect the outcome of the findings of the Team regarding the feasibility of the Data Bank Project and will be discussed between both parties to find alternate solutions.

2. .....

I trust this is acceptable to you, and if you do, I would appreciate your signing copies of this letter in 3-fold, to be distributed as follows :

Original Copy	-	Japanese Team Data Bank System
Second Copy	-	Indonesian Team Data Bank System
Third Copy	-	File Director-General Migas.

Agreed

D. Kasahara
Team Leader JICA

Yours sincerely,

M.A. Warga Dalem
Chairman, Departmental Team

ATTACHMENT - IV

LIST OF DATA COPY OBTAINED DURING THE SURVEY IN INDONESIA

ATTACHMENT IV

List of Data Copy Obtained During the Survey in Indonesia.

A. MIGAS

1. MIGAS Organization Chart.

2. Petroleum & Natural Gas Industry of Indonesia, June, 1978.

3. The Government Regulation of the Republic of Indonesia Number 17, 1974, re the Supervision of Oil and Natural Gas Exploration and Exploitation Activities in Off-shore Area.

4. Rancangan Peraturan Menteri PERTAMBANGAN, No. /P/M/ Pertamb/19.. tentang Pemberitahuan Pendirian Instalasi PERTAMBANGAN Minyak dan Gas Bumi Didaerah Lepas Pantai (Page 1 and 2) (Bab II, Pasal 17).

5. Rancangan Peraturan Menteri PERTAMBANGAN, No. /P/M/ Pertamb/19.. tentang Pemberitahuan Pemasangan Pipa Penyalur untuk Eksplorasi dan Eksploitasi Minyak dan Gas Bumi Didaerah Lepas Pantai (Page 1, 2) (Bab VI pasal 22).

6. Rancangan Peraturan Menteri PERTAMBANGAN, NO. /P/M/ Pertamb/19.. tentang Pemberitahuan, Laporan dan Data Penyedilikan Geologis dan Penyelidikan Dasar Lainnya Mengenai Minyak dan Gas Bumi Didaerah Lepas Pantai (Page 1 to 4) (Bab IV Pasal-Pasal 25 s/d 27).

7. Rancangan Peraturan Menteri PERTAMBANGAN, No. /P/M/ Pertamb/19.. tentang Pemberitahuan, Laporan dan Data Penyelidikan Geofisik dan Penyelidikan Lainnya Mengenai Minyak dan Gas Bumi Didaerah Lepas Pantai (Page 1 to 5) (Bab V Pasal-Pasal 28 s/d 32).

8. Rancangan Peraturan Menteri PERTAMBANGAN, No. /P/M/Pertamb/19... Tentang Pemboran Eksplorasi, Pemboran Pengembangan dan Pemboran Penilaian Minyak dan Gas Bumi Didaerah Lepas Pantai (Page 1 to 11) (Bab VII Pasal 37 ayat-ayat (1) dan (3) jo (4), Pasal 39 ayat (1), Pasal 41 ayat (3), Pasal 43 ayat (1), Pasal 45)

9. Following Formats of Peraturan Menteri PERTAMBANGAN

1) Model EP-I-1
2) Model EP-I-2
3) Model EP-I-3
4) Model EP-I-4
5) Model EP-I-5
6) Model EP-I-6
7) Model EP-I-7
8) Model EP-I-8
9) Model EP-I-9
10) Model EP-I-10
11) Model EP-I-11
12) Model EP-I-12
13) Model EP-I-13
14) Model EP-I-14
15) Model EP-I-15
16) MOdel EP-I-16
17) Model EP-I-17
18) Model EP-I-18
19) Model EP-I-19
20) Model EP-I-20
21) Model EP-I-21
22) Model EP-I-22
23) Model EP-II-3 (Page 1 to 4)
24) Model EP-II-4

10. Brief Description of the O.A.R.S. System

11. Input Data Sheet for the following Application Program in MIGAS O.A.R.S.

    1) Annual/Monthly Budget and Work Program

    2) Annual Crude Oil Production Forecast (by Month)

    3) Annual Crude Oil Production Forecast

    4) Annual Crude Oil Lifting Program

    5) Survey Activity

    6) Exploration/Development Drilling Activity

    7) Well Completion Report

    8) Monthly Well Report

    9) Monthly Production Distribution Own Use and Inventory

    10) Monthly Well Report

    11) Monthly Gas Production and Utilization

    12) Monthly Expenses and Operating Cost

    13) Annual Refinery Forecast Crude/Production

    14) Annual Refinery Receipt Log

    15) Monthly Refinery DeliveryLog

    16) Monthly Refinery Intake Summary

17) Monthly Refinery Output Summary

18) Annual Domestic Marketing Requirement Forecast

19) Monthly Domestic Marketing Receipt Log

20) Monthly Domestic Marketing Delivery Log

21) Monthly Domestic Marketing Sales (Inventory Recap)

12. Notification to Drill

B. PERTAMINA Head Office

1. Organization of Direktorat Eksplorasi & Produksi

2. Organization Chart of Exploration Department of PERTAMINA E&P

3. Items in Output Geologi yang diinginkan

4. Classification Card of Data and Reports

5. Followings in PERTAMINA Unit EP-II Plaju
   Laporan Bulanan Bidang Eksplorasi, August 1978
   - Cover
   - Distribution Chart
   - Daftar Isi
   - List of Lampiran

6. Followings in PERTAMINA Unit II Laporan Tahunan Eksplorasi 1974
   - Cover
   - Daftar isi
   - Lampiran Laporan Tahunan 1974 Eksplorasi

7. Followings in Laporan Tahunan tahun 1973 Bahagian Eksplorasi Unit II
   - Cover
   - Daftar isi

8. Followings in Memo Eks. PL. No.214. Usul Pemboran Tanjung Miring Timur Lokasi -G Bidang Eksplorasi PERTAMINA UEP-II
   - Cover
   - Daftar isi
   - List of Lampiran

9. Followings in Memorandum EKS.PL. No. 191 Usul Pemboran Eksplorasi Lokasi Sengeti -X^1 Bidang Eksplorasi
   - Cover
   - Daftar isi

10. Followings in Laporan Akhir Pemboran Sumur Benuang #10
   - Isi
   - List of Lampiran
   - List of Appendiks
   - Cover

11. Followings in Memorandum EKS.PL. No. 170 Resume Geologi Sumur Arang-Arang Barat -1 oleh Seksi Geology
   - Daftar Isi
   - Cover

12. Followings in Final Report Napal No. 1 Exploration Operation September 1974
   - Cover
   - List of Contents
   - List of Enclosures

13. Followings in Memorandum EKS No. 150 Resume Sumur Eskplorasi Beringin -1 Serta Pengusulan Lokasi Beringin -B oleh Sie Geolog
   - Cover
   - Daftar isi

14. Followings in Final Report Lembak Project for Perusahaan Pertambangan Minyak dan Gas Bumi Negara (PERTAMINA UNIT II) by Geophysical Service International Exploration Service Party 3726 Singapore July 1976
   - Cover
   - Table of Contents
   - List of Plates
   - List of Enclosures

15. Followings in Perusahaan Negara Pertambangan Minyak Indonesia Sumatra Report on a Seismic Survey by Reflection Method Djambi Permit Kehidupan Area February 22, 1968~September 14, 68
    - Cover
    - List of Content

16. Followings in Memorandum EKS. No. 160. Studi Penyelidikan Seismik Daerah Pagar Gunung Suban Jerigi Sumatera Selatan oleh Ir. Basuki Puspoputro
    - Cover
    - Daftar isi
    - Daftar lampiran

17. Followings in Final Report on Gravity Survey in Lagan area - Djambi and Indragiri Hilir area - Riau Eastern part Sumatera, Indonesia by J. Rainir Dhadar Budijarto, Ministry of Mines, Directorate General of Mines, Geological Survey of Indonesia, Bandung, March 1, 1971 (Laporan Ekspor No. 31179)
    - Cover
    - Contents
    - List of Appendix

18. Followings in Progress Report on Gravity Surveys Daludalu/ Pasiepengarajan Projects (Project No. 2) by Bahtoal Chatab and Tan Soan Houn
    - Cover
    - Table of Contents (Format)

19. Followings in Sintang-Bangko Gravity Survey by P.L. Otts
    - Cover
    - Table of Contents (format)

20. Followings in Jenney Indonesian Joint Venture Aeromagnetic Survey Bangkahulu Area (Sumatra) May 1973

- Cover
- Table of Contents
- List of Plates and Figures

21. Followings in Airborne Magnetometric Survey Southeast Sumatra Palembang Area, July 1972
    - Cover
    - List of Plates
    - List of Figures
    - Table of Contents

22. Followings in Aeromagnetometric Survey South-East Sumatra Interpretation, April-July 1971
    - Cover
    - List of Figures
    - List of Plates
    - Table of Contents

23. Followings in Laporan EP/PL. No. 1463
    LAPORAN PEMETAAN GEOLOGI DAERAH TG. KEMALA - BANJARNEGERI (BAHAGIAN UTARA LAMPUNG SELATAN) DASWATI I LAMPUNG
    - Cover
    - Daftar isi

24. Followings in Laporan EKS.PL. No. 1471
    LAPORAN PEMETAAN GEOLOGI DAERAH BESAI, SEPUTIH - PENYAHDINGAN DAN SEKAMPUNG HULU (LAMPUNG), Plaju 1 April 1973
    - Cover
    - Daftar isi
    - Daftar lampiran

25. Followings in Geologic Report Batang Terap and Sungai Kedjasung Ketjil Middle Duabelas Mountains Area South Sumatra, October 1970

- Cover
- Table of Contents

26. Followings in Report on the Geology and Oil Possibilities of the Bangkinang Area, Central Sumatra, April 1952
    - Cover
    - Table of Contents
    - List of Plates

27. Followings in Factors Controlling Oil Accumulations in Jambi Basin, December 1975
    - Cover
    - Table of Contents
    - List of Illustrations

28. Followings in Memorandum Eksplorasi No. 163 PENILAIAN PROSPEK HIDROKARBON PADA STRUKTUR S. GELAM DAN SEKITARNYA, Juni 1976
    - Cover
    - Daftar isi
    - List of Lampiran

29. Followings in Petroleum Geology of the Mentawai Contract Area Indonesia, April 1971
    - Cover
    - Table of Contents
    - List of Illustrations

30. Followings in South Sumatra Geological Review (Lubuk Rukum Results)
    - Cover

31. Followings in Discussion of the Lubuk Rukum Exploration Well Results and the Future Prospects in West Ogan, December 30th, 1971
    - Cover
    - Table of Contents

32. List of contents of Petrographic Analysis of Rock Samples from South Sumatra and Lampung areas for Pertamina Unit II, Part I & Part II

33. List of figures of Biostratigraphy of the Tebo-Taluk Survey

34. List of contents of Memorandum EKS No. 175 Pemeriksaan Mikropaleontologi Sumur Kedaton-I.

35. Following in Laporan EKS. PL. No. 1445 P.N. PERTAMINA Unit II, PENJELASAN RENTJANA KERDJA EKSPLORASI 1969 RENTJANA KERDJA DAN ANGGAPAN EKPLORASI 1970 KEGIATAN-KEGIATAN KONTRAKTOR-KONTRAKTOR ASING 1969/1970
    - List of Daftar Isi
    - List of Daftar Lampiran

36. Program Pengeboran (Format Only)

37. Kebutuhan Material (Format Only)

38. Laporan Mingguan Pengeboran (Format Only)

39. Final Drilling Report (Format Only)

40. Daftar Ukuran Tubing (Format Only)

41. Drill Stem Test Report (Format Only)

42. Laporan Penyemenan (Format Only)

43. Daftar Selubung (Format Only)

44. S.W.S. Report (Format Only)

45. Cutting Report (Format Only)

46. Workover Program (Format Only)

47. Laporan Reparasi/Pembaharuan (Format Only)

48. Laporan Penyelesaian/Perubahan Keadaan Sumur (Format Only)

49. Recompletion Report (Format Only)

50. Program Pengasaman (Format Only)

51. Program Perangsangan (Format Only)

52. Hydraulic Fracture Treatment Report (Format Only)

53. Laporan B.U.C. (Format Only)

54. Perhitungan Derajat Beda Tekanan (Format Only)

55. Laporan Pengukuran & Perhitungan Tekanan Dasar (Format Only)

56. Bottom Hole Pressure Survey (Format Only)

57. Gas Analysis (Format Only)

58. Well Status (Format Only)

59. Followings in Reservoir Data Book
    - I Geological Data (Format Only)
    - II Medium and Fluid Data (Format Only)
    - III Volumetric Reserve Data (Format Only)
    - IV Performance Analysis and Recovery Efficiency (Format Only)

60. Well Resume (Format Only)

61. Daftar Software di PERTAMINA

62. Input Data Sheet for the following Application Programs utilized in PERTAMINA Head Office.

1) Gas Deviation Factor
2) Gas Deliverability
3) Oil Field Production Data, Individual Well Report
4) Depletion Drive Material Balance at and above Bubble Point
5) Economic Analysis of New Drilling
6) Two Dimensional Water Flood, Stiles-Method
7) Decline, Exponential and Harmonic
8) Pressure Distribution, Re dihitung
9) Pressure Distribution, Re diketahui
10) Log Analysis
11) Curve Fitting
12) Topography Area
13) Polygon Area
14) Coordinate Transformation, Polyester to Geodetic
15) Coordinate Transformation, Geodetic to Polyeder
16) Coordinate Transformation, Polyeder to Mercator
17) Coordinate Transformation Geodetic to UTM
18) Exploration Economic
19) Histogram Statistic Produksi Minyak Mentah Indonesia
20) Histogram Umum
21) Velocity Study from Seismic Data
22) Gas Cost
23) Gas Balance
24) Gas Price Evaluation to Pusri II
25) Velocity Study from Seismic Data
26) Production Cost Report per Unit
27) Shilthuis Material Balance
28) Economic Evaluation
29) Cadangan Minyak & Condensate
30) Decline Production

31) Yearly % Decline
32) Well Production Decline
33) Logging
34) Velocity Analysis from Sonic Log
35) Internal Velocity vs. Time
36) Internal Velocity
37) Internal Velocity from Seismic 1
38) Internal Velocity from Seismic 2
39) Normal Move Curve
40) Well Velocity Survey
41) Density Analysis for Gravity Survey
42) Despatch Graph
43) Velocity Study from Seismic Data
44) Well Velocity Entermination Graph
45) Velocity Function

63. Brief description chart of PERTAMINA SYSTEM SOFTWARE.

64. Brief description of PARAMETER LIBRARIES OF SYSTEM GENERATION OS/VS 1 REL. 6.0E.

65. Copy of TABLE OF CONTENTS in UCC TEN USER'S GUIDE.

66. Hardware Equipment List.

67. Non-IBM Hardware Equipment List.

68. Hardware Configuration of following systems:

1)	PDE Wil I		1978
2)	PDE Wil II	Plaju	1978
3)	PDE Wil III	Jakarta	1978
4)	PDE Wil IV	Balikpapan	1978
5)	PDE Wil V	Cilacap	1978

69. Online Configuration of Jakarta.

70. IBM S/1130 Hardware Configuration.

71. CALCOMP Plotter and Digitizer Hardware Configuration.

72. WANG 2200 B machine Configuration.

73. Memo on the Items 2, 3 and 5 in Chapter V of the Letter dated on November 27, 1978 addressed to Mr. Warga Dalem from Mr. D. Kasahara.

74. Computer system configuration at PERTAMINA JAKARTA July 1980.

75. Computer system configuration at PERTAMINA JAKARTA April 1981.

76. IMPORTANT UCL TEN FEATURES

C. PERTAMINA Area II

Refer to APPENDIX VIII of ATTACHMENT V.

ATTACHMENT V

MINUTES OF DISCUSSIONS AT PLAJU

1. FINDINGS RELATED TO THE DATA BANK FOR THE FIRST STAGE

2. FINDINGS OTHER THAN THE DATA BANK SYSTEM FOR THE FIRST STAGE

LIST OF APPENDIX

MINUTES OF DISCUSSIONS AT PLAJU

Subject : The Petroleum Exploration & Production Data Bank System Development Project, Republic of Indonesia.

Date on : December 5 through December 15, 1978.

Place at : PERTAMINA UNIT-II Head Office.

Attendants : As in Appendix I.

The Plenary Meeting has been opened with the introduction of Indonesian counter part team organized by PERTAMINA Unit II Head Office made by Mr. Azir Hamid, Manager Unit Exploration & Production-II PERTAMINA Area-II and followed by the general explanation of the background of the project made by Mr. B. S. Sitoemorang, Team Leader of Indonesian Team in Jakarta.

Following the opening session of the Meeting, Japanese survey team, headed by Mr. Daishiro Kasahara, team leader of Japanese survey team, discussed their survey schedule in Plaju with the counterpart team, headed by Mr. Z. A. Kamili, team leader of Indonesian counterpart team, Head Exploration PERTAMINA Unit EP-II. The discussion and survey have been performed on the Petroleum Exploration and Production Data Bank System Development Project, Republic of Indonesia during the period between December 5 and December 15, 1978 by Japanese survey team with the cooperation of the Indonesian counterpart team in separating into three subteams as shown in Appendix-I.

During the survey, three members of Japanese survey team visited field office at Bajubang, where they discussed the matter related to the Project with Mr. Sunarto R.S., Secretary of Field Superintendent, Mr. Hassanal Peringgayuda, Head Exploitation and Mr. Darmadi, Head Production PERTAMINA Unit EP-II Bajubang. All the member of Japanese survey team had visited field office at Prabumulih accompanied by Mr. Basuki Puspoputro, Geophysicist PERTAMINA Unit EP-II and Mr. Susito K., Production Engineer

...2

PERTAMINA Unit EP-II and Mr. Heroe S., MIGAS, where they collected the information and discussued the matter related to the project with Mr. H. S. Soekadis, Field Superintendent PERTAMINA Unit EP-II Prabumulih and his staffs.

The followings are major aspects of findings and understanding made at the survey.

1. Findings Related to the Data Bank System for First Stage:

1). The Data Bank System should have the geological and production information related to the gas and oil fields as in Appendix-II for the time being.

2). The Data Base should have historical data as described in Appendix-III.

3). Language to be utilized in Data Bank System should be English.

4). The Data Bank System to be established at Unit-II Head Office should be consisting with the coding and indexing system for the integrated data filing system which will be decided by PERTAMINA until about middle of June 1979.

5). The Data Bank System should be designed in the manner of integrating the seperated satellite data filings which will be furtherly computerized or microfilmized independently of the Data Bank System.

6). Items to be stored in the Data Base will be properly proposed at the middle of June, 1979 taking consideration into the requirements and the information discussed and collected by Japanese survey team, however folloving items requested by Indonesian counterpart team as much as possible.

...3

a). Items as shown in Appendix-IV.
Discussion were made on the detail items and their formats by both experts respectively and as a result a common understanding has been reached.

b). Informations related to specific reports, well files and periodical reports.

c). Input items in the application programs of which title is shown in Appendix-V.

7). The Data Bank System should be designed in the manner of preparing new type reports by cross reference of information in the Data Base. Output reports as shown in Appendix-VI was requested to produce in addition to currently availabe four kinds of reports related to production statistics.

8). Data flow in the computer system is confirmed by the figure in Appendix-VII. Design of the computer system should be made fundamentally based on the figure described in Appendix-VII, however some modification will be expected to require for meeting the Data Bank System. Modification will depend upon the volume and kinds of data found after analysis of the collected information.

2. Findings Ather than the Data Bank System for the First Stage.
In the course of the survey, some desires to improve system related to data filing other than the Data Bank System for the first stage have come out from Indonesian counterpart team.
Those have been recoginized by Japanese survey team as follows:

1). The establishment of the integrated data filing system with a coding and indexing system for whole PERTAMINA.
Data of each department in Unit EP-II Head Office are filed in different manner according to their respective coding and indexing system. This has prevented computerization and microfilmization of the data stored in each department.

2). Equipment of more sophistcated application programs.

3). Microfilmization of documentations and maps being stored in each department.

4). Introduction of retrieval system on microfilmized data to the Data Bank System.

5). Improvement of currently applied computerized system for drilling operation.

6). Improvement of the gathering system of the data related to Technical Department of Unit EP-II Head Office.

7). Standardization of technical monthly and yearly reports to PERTAMINA Head Office in Jakarta to minimize report preparation work.

8). Improvement of data entry system and peripherals to computer system in PERTAMINA AREA-II.

9). Introduction of data communication system between Field Office, Head Office in Area-II and Head Office in Jakarta.

During the survey, the information related to the project has been provided to Japanese survey team by the Indonesian counter part team and the list of the information is attached herewith as in Appendix-VIII. Japanese survey team expresses its heartiest gratitude for the kindest cooperation of Mr. Azir Hamid and his staffs at the moment of closing the survey in Plaju.

Plaju, December 16, 1978.

D. KASAHARA
Team Leader JICA

IR. AZIR HAMID
Manager Unit EP-II.

APPENDIX I

ATTENDANT LIST

1. INDONESIA Side.

(1) UNIT EP-II - PLAJU.

		Subteam.
AZIR HAMID	- Manager Unit EP-II.	
DARNI ISKANDAR	- Act.technical Depart.Head	
HASAN BASRI	- G. Affair Dept. Head.	
EDI SUROTO	- Production Dept. Head.	
S U R O N O	- Gas Dept. Head.	
AMINARTO	- Drilling Dept. Head.	
Z.A. KADILI	- Exploration Dept. Head.	I
BASUKI PUSPOPUTRO	- Geophysicist.	I
A Z Z A K	- Ass. Paleontologist.	I
ZAINAL ACHMAD	- Geologist	I
AMUNG WIDODO	- Geophysicist.	I
S U N O K O	- Exploitation Eng	II
SUSITO K.	- Production Eng.	II
PANUT SULYATNO	- Drilling Eng.	II
TUGIONO	- Technical Eng.	II, III
DJUKERO	- Exploitation Eng.	III
NUR RUSLAN	- Data Processing Eng.	III
LILY HABALI	- Data Processing Eng.	III
A N W A R	- Telecom Dept. Head	III
BAMBANG SULISTYO	- Radiotel Dept. Sect.Head	III

(2) UNIT EP-II - BAJUBANG.

SUNARTO RS	- Secretary of P. Superintendent.
HASSANAL P.	- K. EL
DARMADI	- Ka. Sub.Bid.Produksi.

(3) UNIT EP-II - PRABUMULIH.

		Subteam
H.S. SOEKADIS	- Field Superintendent.	
HARYOKO K	- Head of Exploitation.	
ISMORO SUHARNO	- Petroleum Eng.	
EMIR LUBIS	- Geophysicist.	
UKTOLSEJA AGUS	- Technical Eng.	
JUSRI DAHAR	- Production Eng.	
ISMAIL I.	- Gas Dept. Head.	

(4) J A K A R T A.

B.S. SITOMORANG	- Pertamina Pusat.
HEROE S.	- Migas.

2. JAPAN Side.

D. KASAHARA	- Team Leader	
H. TAKIZAWA	- Geologist	I
A. SHIBUYA	- Geophysicist	I
E. EZOE	- Mechanical Eng.	II
H. KUSANO	- Drilling Eng.	II
T. IWAMORI	- Reservoir Eng.	II
H. ISONO	- System Eng.	III
H. HASHIMOTO	- System Eng.	III

APPENDIX-II
LIST OF OIL AND GAS FIELD CONCERNED WITH THE DATA BANK SYSTEM

I. Palembang Complex.

1. South Palembang Complex.

- Prabumulih centre.
- Prabumulih west.
- Lembak.
- Payakabung.
- Talang Jimar.
- Tanjung Tiga West.
- Tanjung Tiga East.
- Tanjung Miring West.
- Tanjung Miring East.
- Gunung Kemala.
- Benuang.
- East Benakat.
- Limau East-HC.
- Limau West-5A.
- Belimbing.
- Tanjung Lontar.
- Suban Jeriji.
- Batu Keras.
- Sungai Taham.
- K u a n g .
- T a s i m .
- Pagardewa.
- Prabumenang.
- Meraksa.
- K i k i m .
- Ogan Block.
- Lubuk Rukam.
- Karangan.
- Beringin.
- Sukacinta.
- B e t u n g .
- Kedaton.
- H u s i .

- Lampung.
-)
-)
-)
-) option.
-)
-)

2. Middle Palembang Complex.

- Mangunjaya.
- B a b a t .
- K u k u i .
- K e b a n .
- Suban Burung.
- Kluang.
- Kluang North.
- Lebong.
- Bentayan.
-)
-) option.
-)

II. Jambi Area.

- Bajubang.
- Tempino.
- Kenali Asam.
- Kenali Asam West.
- Kasang.
- Sungai Gelam.
- Pijoan.
- Setiti.
- Keruo Senami.
- Sungai Lilin.

...

- Senawar.
- Bayung Lincir.
- Sengeti.
- Arang2 West.
-)
-)
-) option.
-)
-)

APPENDIX III

Historial Data to be stored in Data Base

	Remarks
1). Geological & Geophysical Data	Since 1966
2). Well File	All the well file
3). Production Statistics	Since 1966 (only monthly figures)
4). Production Facility	Existing Status only

Remarks

Historical input data should be prepared in the manner of the older going back from the latest to.

APPENDIX IV

Items to be stored in the Data Bank System.

1. GEOPHYSICAL.

1). Seismic Survey.

a). List of Survey.
b). Seismic Section.
c). Maps.
d). Well Shooting Data.
e). Reports.

2). Magnetic Survey.

a). List of Survey.
b). Magnetic Records
c). Maps.
d). Reports.

3). Gravity Survey.

a). List of Survey.
b). Gravity Record.
c). Maps.
d). Reports.

4). Other Survey.

a). Kinds of Survey.
b). Kinds of Record.
c). Maps.
d). Reports.

5). Production Efficiency and Economy.

a). Operation Cost.
b). Processing Cost.
c). Interpretation Cost.
d). Total Cost.

6). Others.

a). Tape Storage.
b). Explosive Balance.
c). Man Power.

2. G E O L O G I C A L

1). General Geological Information.

a). Geological Field Survey.
b). Photogeological Information.
c). Leases Concession Information.
d). Exploration Well Information.

2). Analysis Data Information.

a). Core Analysis.
b). Source-Rock Analysis.
c). Paleontological Analysis.
d). Petrographical Analysis.
e). Fluid Analysis.
f). Other Analysis.

3). Study Results Information.

a). Maps.
b). Geological Cross Section.
c). Correlation.
d). Restored Section.
e). Reports.

3. WELL DATA.

1). Well Informations.

a). Well and Drilling Informations.
b). Geological Informations.
c). Testing Informations.
d). Other Infomations.

2). Work Over Informations.

a). Work Over Informations.
b). Testing Informations.
c). Other Informations.

3). Artificial Lifting.

a). Rod Pumping.
b). Submergible Centrifugal Pumping.
c). Gas Lifting.

4. PRESSURE AND PRODUCTION DATA.

1). Production Data.
2). Injection Data.
3). Pressure - Production Data.

5. FLUID ANALYSIS DATA.

1). Oil Analysis.
2). Gas Analysis.
3). Water Analysis.

6. OPERATION DATA FOR PRODUCTION FACILITY.

7. PRODUCTION EQUIPMENT & PIPELINE.

1). Scheme of Plant.
2). Pipeline.
3). Vessel.
4). Heat Exchanger & Boiler.
5). Rotary Machine.
6). Driver & Generator.
7). Others.

APPENDIX-V

Application Program in unit II Head Office

1). M.R.P.W (Monthly Report Production Well).

2). P.D.R. (Production Data per Reservoir).

3). Block Station OIL.

4). Block Station GAS.

5). Reserve OIL & CONDENSATE.

6). Flowing Bottom Hole Pressure.

7). Static Bottom Hole Pressure.

8). Shilthuis Material Balance.

9). Gas Deliverybility & Economic Evaluation.

10). Tarner Method Material Balance.

11). Decline Production.

12). Factor.

APPENDIX VI

Output Reports required by Subteam 2 of Indonesian Counter part team

1. Monthly Report of Producing Well.

   (1) By Well (Currently available Output Report).
   (2) By Reservoir (Currently Available Output Report).
   (3) By Block Station (Per Station) (Currently Available Output Report).
   (4) By Block Station (Gas Per Station) (Currently Available Output Report).
   (5) By Field.

2. Monthly Report of Producing Well - Producing Well only

   (1) By Well.
   (2) By Reservoir.
   (3) By Block Station (Per Station).
   (4) By Block Station (Gas Per Station).
   (5) By Field.

3. Monthly Report of Producing Well - Natural Flowing Well only

   (1) By Well.
   (2) By Reservoir.
   (3) By Block Station (Per Station).
   (4) By Block Station (Gas Per Station).
   (5) By Field.

4. Monthly Report of Producing Well - Gas Lift Well only

   (1) By Well.
   (2) By Reservoir.
   (3) By Block Station (Per Station).
   (4) By Block Station (Gas Per Station).
   (5) By Field.

5. Monthly Report of Producing Well - Pumping Well only

(1) By Well.
(2) By Reservoir.
(3) By Block Station (Per Station).
(4) By Block Station (Gas Per Station).
(5) By Field.

6. Monthly Report of Producing Well - Shut-in Well only

(1) By Well.
(2) By Block Station (Per Station).
(3) By Block Station (Gas Per Station).

7. Monthly Report of Producing Well - Abandonment Well only

(1) By Well.
(2) By Block Station (Per Station).
(3) By Block Station (Gas Per Station).

8. Monthly Report of Producing Well - High Water Cut Well only (more than 50%)

(1) By Well.
(2) By Block Station (Per Station).
(3) By Block Station (Gas Per Station).

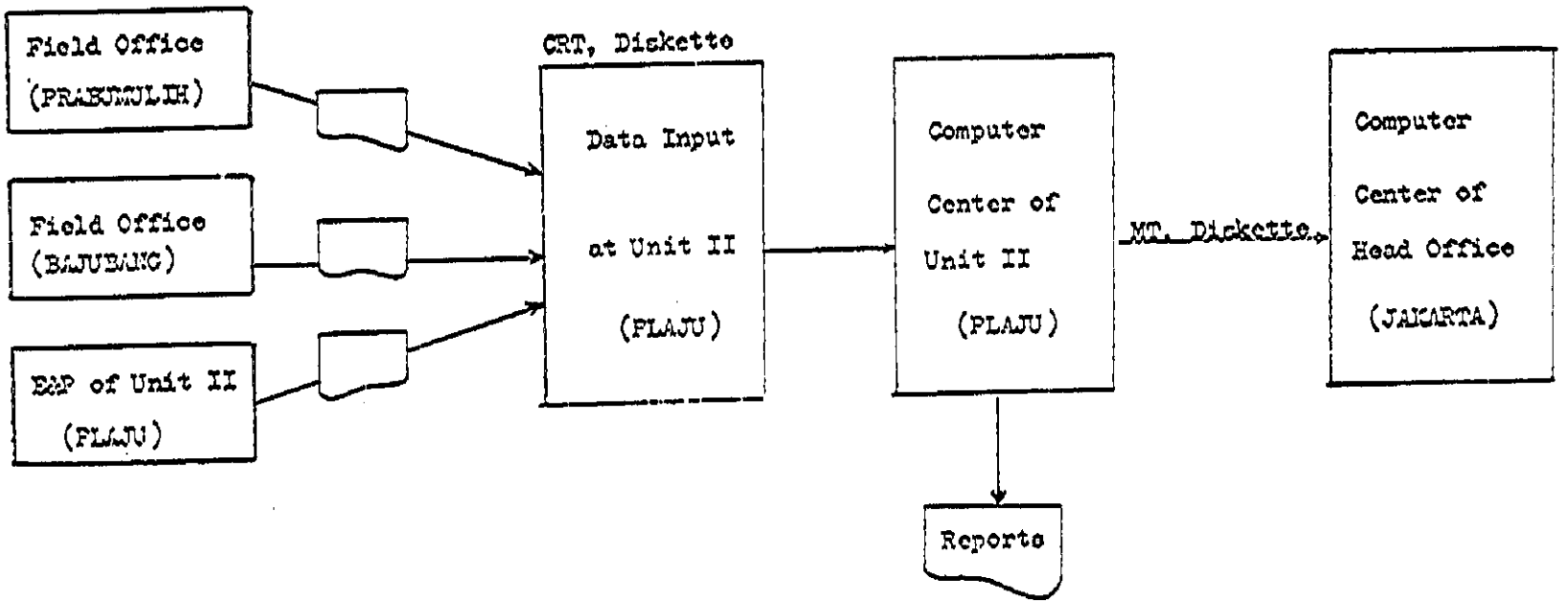
9. Monthly Report of Producing Well - High GOR Well only (more than 300 M^3/M^3).

(1) By Well.
(2) By Block Station (Per Station).
(3) By Block Station (Gas Per Station).

10. Monthly Report of Injection Well.

Appendix-VII

Data Flow in the Computer System



APPENDIX-VIII

List of Data Copy Obtained During the Survey at PERTAMINA Area-II.

1. General

1). FOLLOWING ORGANIZATION CHART.

a. Direktorat Eksplorasi & Produksi.
b. Koordinator Wilayah.
c. Unit Eksplorasi & Produksi.
d. Bidang Eksplorasi.
f. Bidang Eksploitasi.
g. Bidang Bor.
h. Bagian Bor Lapangan.
i. Bidang Gas.
j. Technical Dep.(made by free hand).
k. Organigram & Establisment Bidang Eksplorasi UEP-II.
l. Manning Wilayah-II Plaju.

2). INDEXING UNTUK MICROFILM SYSTEM.

3). STUDI & PERENCANAAN,
SISTIM ADMINISTRASI KEARSIPAN PERTAMINA PERPADU 1978.

4). PEDOMAN PELAKSANAAN MICROFILM SYSTEM 1974.

5). FOLLOWING MAPS.
a. Wilayah Kerja Pertambangan (WKP) Wil.II
b. Untuk Minyak Wil.II
c. South Sumatra Gas Project - Pusri III
Gathering & Transmission Gas Pipeline.

2. Exploration.

1). Periodical Report.
a. Weekly Geological Report (Blank Sheet).
b. Monthly Geological Report (Blank Sheet).
c. Daily Traverse Report (Blank Sheet).
d. Paleontological Laboratory, Daily Report (Blank Sheet).
e. Paleontological Laboratory, Daily Report (Blank Sheet).

f. Paleontological laboratory, Monthly Report (Blank Sheet).

g. Well Daily Report with DST Report (Blank Sheet).

h. PERTAMINA UNIT EP - II PLAJU
LAPORAN BULANAN BIDANG EKSPLORASI, AGUSTUS-1978.

i. PERTAMINA UNIT EP-II PLAJU
LAPORAN BULANAN BIDANG EKSPLORASI, SEPTEMBER-1978.

j. LAPORAN TAHUNAN, TH. 1973 BAHAGIAN EKSPLORASI UNIT EP-II.

k. PERTAMINA UNIT EP-II PLAJU
LAPORAN BULANAN BAGIAN EKSPLORASI, DESEMBER-1974.

l. RINGKASAN LAPORAN TAHUNAN
KEGIATAN EKSPLORASI Th. 1976

m. LAPORAN TAHUNAN UNIT EKSPLORASI & PRODUKSI-II 1977.

2). Geophysics.

a. Following in Memorandum EXS No. 160
Studi Penyelidikan Seismic Daerah Pagar Gunung - Suban Jerigi Sumatra Selatan.
- Cover.
- Covering Letter (Memorandum).
- List of Contents.
- List of Maps.

b. Followings in Final Report, North Lampung Seismic Project for PERTAMINA - Unit II (May 1974).
- Cover.
- Abstract.
- Table of contents.
- List of Plates.
- List of Enclosures.
- Heading of Location Map of Suspected Reef Growth.
- Heading of Time Contour Map, Horizon-A.
- Heading of Time Contour Map, Horizon-B
- Heading of Isochron, A-B.
- Heading of Seismic Section Line L-30A.
- Heading of Shot Point Map, North Lampung.
- Heading of Vertical and Horizontal Loop Closure Map, North Lampung.
- Heading of Noise Analysis, North Lampung.

c. Followings in P.N.PERTAMINA Unit-II, Ogan Permit, Sixth Report, Pagar Gunung Survey (1971 - 1972).

- Heading of Location Map (PL. 1a).
- Heading of Location Map (PL. 1b).
- Heading of Time Contour Map, Horizon 5 (PL. 11).
- Heading of Time Section, Line TK-3 (PL. 13).
- Heading of Time Contour Map, Horizon 5 (PL. 17b).
- Heading of Time Contour Map, Horizon 2 (PL. 18a).
- Heading of Time Contour Map, Horizon 2 (PL. 18b).
- Heading of Time Contour Map, Horizon 1 (PL. 19).
- Heading of Time Contour Map, Horizon 4 (PL. 20).
- Heading of Time Contour Map, Horizon 6 (PL. 21).
- Heading of Time Interval Contour Map (PL. 22a).
- Heading of Time Interval Contour Map (PL. 22b).
- Heading of Time Interval Contour Map (PL. 23).

d. Followings in AIR BORNE MAGNETOMETRIC SURVEY SOUTH EAST SUMATRA PALEMBANG AREA, NOVEMBER - DECEMBER 1972.

- Cover.
- Table of Contents.
- List of Plates.
- List of Figures.
- Heading of Residual Field Intensity Contour Map (Map Number 1).
- Heading of Residual Field Intensity Contour Map (Map Number 2).
- Heading of Residual Field Intensity Contour Map (Map Number 3).
- Heading of Residual Field Intensity Contour Map (Map Number 4).
- Heading of Residual Field Intensity Contour Map (Map Number 5).
- Heading of Residual Field Intensity Contour Map (Map Number 6).
- Heading of Residual Field Intensity Contour Map (Map Number 7).
- Heading of Typical Magnetic Zones (Map Number 8).
- Heading of Comporison of Interpreted Aeromagnetic C, Line 19-519 with Seismic Protile BAI (Map Number 9).
- Heading of Interpretation Map (Map Number 10).

e. Following in GRAVIMETRISCH ONDERZOEK LEMBAK - LEMAU - ANTICLINORIUM.
   - Cover.
   - Location Map.
   - List of Contents (Deel 1).
   - List of Fignres.
   - REPERENTIEHAARDEN BASISHUNTEN EN KNOOPPUNTEN.

f. A Table of Statistical Report for November 1978 (GSI Party 1814).

g. A Seismic Line Map (Komplek Palembang Selatan, Peta Kemajuan Kerja Penyelidikan Seismik, 1978 - 1979).

h. Statistik Kemajuan Harian Penembakan (Format Only).

i. Ringkasan Laporan Pemboran, Penembakan & Dinamit (Format Only).

j. Laporan Bulanan Penyelidikan Seismik (Format Only).

3). Geology.

a. Followings in LAPORAN PENDAHULUAN SURVEY GEOLOGI DAERAH CUHAI SUMATRA SELATAN, MEMO EKS-206.
   - Covering Letter (MEMORANDUM).
   - List of Contents (ISI).
   - List of DAFTAR GAMBAR.
   - List of DAFTAR LAMPIRAN.

b. Following in SEDIMENTOLOGICAL STUDIES ON THE TALANG AKAR FORMATION IN THE LEMATANG BLOCK - SOUTH SUMATRA - INDONESIA, Report No.647.
   - List of Contents.
   - List of Appendix.

c. Following in THE BASEMENT CONFIGURATION OF THE NORTH AND SOUTH JAMBI AREA, MEMO EKS PL.NO.207
   - Covering Letter (MEMORANDUM).
   - List of Contents (DAFTAR ISI).
   - List of DAFTAR LAMPIRAN.

d. Followings in PEMERIKSAAN MICROPALEONTOLOGI SUMUR BEDUANG-10 MEMORANDUM EKS NO.208.
   - List of Contents (DAFTAR ISI).
   - List of LAMPIRAN.

e. Following in USUL PEMBORAN TANJUNG MIRING TIMUR LOKASI-G.
   - List of Contents.
   - List of LAMPIRAN.
   - List of Table.
   - List of Appendix.
   - LAMPIRAN 1 Ringkasan Usul Pemboran TMT-G.

f. Followings in LAPORAN AKHIR PEMBORAN SUMUR BEDUANG // 10.
   - List of Contents.
   - List of LAMPIRAN.
   - List of Appendix.

g. Followings in P.N.PERTAMINA (UNIT-II) SOUTH SUMATRA GEOLOGICAL REVIEW.
   - List of Contents.
   - List of Figures.
   - List of Enclasures.

h. Following in P.N.PERTAMINA UNIT-II OCAH PERMIT Sixth Report PAGARGUNUNG SURVEY 1971 - 1972.
   - List of Contents.
   - List of Figures.
   - List of Plates.

4). Others

a. Table of the total number of specific report PERTAMINA UNIT EP-II EXPLORATION DEPARTMENT status November 1978.

b. Distribution List of Report of PERTAMINA E&P and UNIT-II Head Office.

c. Exploration Filing System.

d. Organization and Members-List of Exploration Department of PERTAMINA UNIT-II.

e. SHELL Standard Legend for EXP 1976.

3. Engineering.

1). Periodical Report.

a. Following in Laporan Tahunan Bidang Produksi Unit EP-II tahun 1977.
- Cover.
- Daftar Isi.

b. Followings in Laporan Bulanan Bidang Produksi September-1978.
- Cover.
- Daftar Isi.
- Laporan Efficiency Servicing Untuk Bulan: September 1978 Lampiran2 (Format Only).
- Perincian Jam Kerja yang hilang Lampiran 4 (Format Only).
- Rekapitulasi Pemakaian Bahan Kimia, Bulan September 1978 (Format Only).
- Well Status Crude Oil Production, Month Augustus 1978 (Format Only).

c. Followings in Laporan Semester I-1978 Bidang Produksi.
- Cover.
- Daftar Isi.
- Well Status Versus Crude Oil Production (Format Only).

d. Followings in Laporan Bulanan Singkat, Unit EP-II Maret 1978 Plaju, April 1978.
- Cover.
- Daftar Isi.

e. Followings in PERTAMINA Unit EP-II Laporan Bulanan Bahagian Eksploitasi Komplek Palembang Selatan, January 1978.

- Distribuation Chart.
- Cover.
- LBBE-XPS, January 1978 Daftar Isi.

f. Followings in Laporan Bulan April 1978.
- Cover.
- Daftar Isi.

g. Followings in Laporan Tahunan Bidang Gas Unit EP-II Tahun 1977.
- Cover

h. Following in Laporan Bulanan Singkat Unit EP-II Augustus 1978.
- Distribution Chart.
- Cover.
- Daftar Isi.
- Laporan Bulanan Singkat Unit EP-II August 1978 (page 1 and 2) (Format Only)
- Produksi Minyak Th. 1978 Unit EP-II BBL/H (Format Only).

i. Followings in Laporan Tahunan Produksi Pertamina Unit II 1972.
- Memorandum.
- Cover.
- Daftar Kecelakaan Tambang & Kecelakaan Perusahaan Pegawai Pertamina Unit II Lapangan Jambi & Peg.Pemborong dalam tahun 1972 (Format Only).
- Jumlah Hari Yang Hilang Pegawai PERTAMINA Unit-II Lapangan Jambi dan Pegawai Pemborong, akibat kecelakaan dalam th. 1972 (Format Only).
- Table Pengiriman dan Penerimaan minyak/gas lapangan2 PERTAMINA Unit-II tahun 1972 (I-III) (Format Only).

j. Followings in Bean Performance For Gas Well No.PL-1515
- Cover.
- Abstract.
- Wellhead Deliverability Test Analysis (page 9) (Format Only).

k. Followings in Laporan Bulanan Bagian Produksi Jambi September 1978.
- Cover.
- Daftar Isi.
- Well Status Versus Crude Oil Production September 1978 (Format Only).
- Laporan Efficiency Well Servicing Units Bulan September 1978 Lapangan Jambi (Format Only).
- Perincian Jam Kerja Hilang (PBH-20,72,78,88,93) (Format Only).
- Perincian Jam Perbaikan Mekanik dari Well Servicing Unit (PBH-77,78,88,93) (Format Only).

l. Followings in Laporan Tahunan 1977, Bidang Eksploitasi PERTAMINA Unit EP-II Plaju.
- Distribution Chart.
- Cover.
- Perbandingan Rencana Dan Pelaksanaan Pemboran Dalam Tahun 1977 Lampiran No.IIA-22. (Format Only)
- Perbandingan Rencana Dan Pelaksanaan Kerja Ulang Dalam Th.1977 Lampiran No.IIA-2b. (Format Only)
- Pelaksanaan Pengeboran PERTAMINA Unit EP-II Th.1977 (page 1 and 2) (Format Only).
- Produksi sebelum dan sesudah kerja ulang KPS Th.1977 Lampiran IIA-3 (Format Only).
- Produksi sebelum & sesudah Kerja Ulang Jambi Th.1977 Lampiran No.IIA-3 (Format Only).
- Produksi sebelum & sesudah Pengasaan 1977 KPS Lampiran No.IIA-3d (Format Only).
- Kajian Produksi Minyak Unit EP-II Th.1977 Lampiran No.IIB-1a (Format Only).
- Kajian Produksi Minyak KPS Tahun 1977 Lampiran No.IIB-1b (Format Only).
- Kajian Produksi Minyak Jambi Tahun 1977 Lampiran No.IIB-1c (Format Only).
- Produksi Minyak Tahun 1977 Unit EP-II (Format Only).
- Produksi Gas Harian Tekanan Tinggi KPS-1977 (HDISCHD).(Format Only)
- Produksi Gas Bulanan Tekanan Tinggi KPS-1977 (HDISCHM).(Format Only)

- Produksi Gas Harian Tekanan Menengah KPS-1977 (MMSCFD)(Format Only).
- Produksi Gas Bulanan Tekanan Menengah KPS-1977 (MMSCFM)(Format Only).
- Produksi Gas Harian Tekanan Rendah KPS-1977 (MMSCFD)(Format Only).
- Produksi Gas Bulanan Tekanan Rendah KPS-1977 (MMSCFM)(Format Only).
- Produksi Harian Gas Tekanan Tinggi dari Compressor KPS (MMSCFD)-1977 (Format Only).
- Produksi Bulanan Gas Tekanan Tinggi dari Compressor KPS (MMSCFM)-1977 (Format Only).
- Produksi Gas Harian Tekanan Tinggi Jambi-1977 (MMSCFD) (Format Only).
- Produksi Gas Bulanan Tekanan Tinggi Jambi-1977 (MMSCFM) (Format Only).
- Produksi Harian Gas Tekanan Menengah Jambi-1977 (MMSCFD) (Format Only).
- Produksi Bulanan Gas Tekanan Menengah Jambi-1977 (MMSCFM) (Format Only).
- Produksi Harian Gas Tekanan Rendah Jambi-1977 (MMSCFD) (Format Only).
- Produksi Bulanan Gas Tekanan Rendah Jambi-1977 (MMSCFM) (Format Only).
- Pemakaian Gas Harian Tekanan Tinggi MMSCFD/FBTU-1977 (Format Only).
- Pengiriman & Penerimaan Gas Harian Tekanan Tinggi ke & di Pusri MMSCFD/1977 (Format Only).
- Pengiriman & Penerimaan Gas Bulanan Tekanan Tinggi ke & di Pusri MMSCFM/1977 (Format Only).
- Pemakaian Harian Gas lift KPS-1977 (MMSCFD) (Format Only).
- Pemakaian Bulanan Gas Lift KPS-1977 (MMSCFM) (Format Only).
- Penyediaan Gas/Feeding Untuk Compressor (MMSCFD)-1977 (Format Only).
- Penyediaan Gas/Feeding Untuk Compressor (MMSCFM)-1977 (Format Only).

m. Following Items in Laporan Semester I-1978
Bidang Eksploitasi Pertamina Unit EP-II Plaju.
- Distribution Chart.
- Cover.
- Daftar Isi.
- Kajian Produksi Minyak Unit EP-II
Januari - Juni 1978 (Format Only).
- Kajian Produksi Minyak KPS
Januari - Juni 1978 (Format Only).
- Kajian Produksi Minyak Jambi
Januari - Juni 1978 (Format Only).
- Produksi Gas Tekanan Tinggi No.IIc-1a-1
- EESCFD-1978 (Format Only).
- Produksi Gas Tekanan Tinggi No.IIc-1a-2
- EESCFD-1978 (Format Only).
- Produksi Gas Tekanan Menengah No.IIc-1a-3
- EESCFD-1978 (Format Only).
- Produksi Gas Tekanan Menengah No.IIc-1a-4
- EESCFD-1978 (Format Only).
- Produksi Gas Tekanan Rendah No.IIc-1a-5
- EESCFD-1978 (Format Only).
- Produksi Gas Tekanan Rendah No.IIc-1a-6
- EESCFD-1978 (Format Only).
- Pengiriman & Penerimaan Gas Ke/Di Pusri (Format Only)
EESCFD/1000BTU/1978 No.IIc-1a-7.
- Pengiriman & Penerimaan Gas Ke/Di Pusri (Format Only)
EESCFD/1000BTU/1978 No.IIc-1a-8.

n. Following Items in Laporan Bulanan Eksploitasi Oktober 1978.
- Distribution Chart.
- Cover.
- Daftar Isi.

o. Following Items in "Laporan Tahunan Bidang Pengeboran Th. 1977".
- Cover.
- Daftar Isi.

p. Following Items in "Laporan Bulanan Singkat Unit EP-II" September-1978.
- Cover.
- Daftar Isi.
- Produksi Minyak Th. 1978 Unit EP-II
  BBL/H Lampiran No. 1 (Format Only).

q. Followings in LAPORAN BULANAN EKSPLOITASI OKTOBER 1978.
- Pengukuran Tekanan Dasar (October 1978).
- Hasil Uji Produksi & Mte SG-5.
- Sumur Penghasil dan Produksi bulan Oktober 1978.
- Produksi & Pemakaian Gas-Jambi 1313 Bulan Oktober 1978 (Format Only).
- Pembagian Produksi Zone dan Lapangan Bulan Oktober 1978.
- Log Evaluation Sheet.
- Persiapan Lokasi Pemboran sampai akhir Oktober 1978.
- Persediaan Dan Pemakaian Bahan Kimia dan semen bor Bulan Oktober 1978.

r. Followings in Laporan Tahunan-1977
Bidang Eksploitasi PERTAMINA Unit EP-II Plaju.
- Memorandum

s. Following Items in "Laporan Tahunan Bidang Pengeboran Th. 1977"
- Cover.
- Daftar Isi.
- Kegiatan Kerja Ulang Pertamina Unit EP-II, Lampiran No.2
- Urutan Pelaksanaan Pengeboran/Kerja Ulang 1977 Lampiran No.3
- Jam Terbang Hellicopter Th. 1977, Lampiran No.8
- Barang Modal Dalam Proses Penyelesaian Tahun 1977 Bulan December, Lampiran No.9
- Program Indent Material EP Rencana Pengeboran Unit EP-II, Juli 1977 - December 1978 Lampiran No. 10

t. Following Items in "Laporan Bulanan Bidang Pengeboran Unit EP-II" Bulan Mei 1978.
   - Cover.
   - Status Angkutan Berat.
   - Kegiatan Instalasi & Pengian Hambatan2, Bulan Mei 1978.
   - Sumur-sumur BAMJ.
   - Grafik Aktivitas Angkutan Berat,
   - Daftar Rig Wilayah.

u. Following Items in "Field Gas Monthly Reped".
   - Pemakaian/Pengiriman Gas ke Pusri II, III, IV Bulan Nopember 1978.
   - Perhitungan Gas ke Pusri dari PTSI (Field MU).
   - Laporan Bulanan Pengiriman Gas PERTAMINA ke Pusri II,III,IV Bulan Nopember 1978.
   - Pemakaian/Pengiriaan Gas ke Pusri II,III,IV Bulan Nopember 1978.

v. Following Items in "Monthly Gas Report Prepered" by Unit-II H.O
   - Perhitungan Jumlah Gas yang dipakai oleh Pusri II,III,IV tanggal 1 - 31 Oktober 1978.

w. Following Items in "Laporan Tahunan-1977 Bidang Eksploitasi Pertamina Unit EP-II Plaju".
   - Cover.
   - Daftar Isi.

x. Laporan Bulanan Bahagian Produksi K/S (Format Only).

y. Following Items in "Laporan Bulanan Eksploitasi Oktober 1978".
   - Cover Latter.
   - Cover.
   - Daftar Isi.

z1. Weekly Production Report, 17 November 1978.
z2. Ringguan Eksploitasi, 21 Oktober 1978.
z3. Laporan Harian Unit EP-II, tgl.25 Nopember 1978.

2). Following Items in Well File.

- Programa Pemboran Lokasi ZYX-1 Limau Hiru.
- Laporan Akhir Pemboran Benuang BH-13.
- Daftar Ukuran Tubing Benuang BH-13 2 7/8"EU J-55.
- Keterangan Penyimpangan Benuang BH-13.
- Laporan Mingguan Pemboran Benuang BH-13.
- Dresser Magcobar D.A.T.A. Morning Report BH-13, 30 January 1978 (Mud Record).
- Hasil Analisa Contoh Cairan Dari HFS, Test Benuang BH-13 3/3/1978.
- Daftar Keterangan Tentang Pahat Benuang BH-13.
- Laporan Penyemenan Benuang BH-13 13 3/8".
- Perubahan keadaan Sumur BH-13, 3 Maret 1978.
- Daftar selubung (casing) Benuang BH-13 13 3/8" 24.1.1978.
- Laporan Pengukuran BJ Adonan Semen BH-13 25/1/78 13 3/8".
- Hasil Uji Kandungan Lapisan LBBE-KPS 1978 BH-13 22 April 1978 Lampiran No.5
- Laporan Penyemenan (Selubung/Squeeze) (Format).
- Laporan Penyemenan Desak (Format).
- Laporan Harian Well Checker (Format).
- Laporan Harian Pengeboran (Format).
- Penggunaan Bahan2 Kimia Disumur (Format).
- Laporan Pengasaman No. (Format).
- Hydraulic Fracture Treatnical Report (Format).
- Laporan Uji Kandungan Lapisan (Format).
- Daftar Keterangan Tiap Sumur Sandi Lapangan 100, Sumur 014.A Okt.78
- Programa Pengukuran Tekanan Dasar Sumur (Format).
- Laporan Pengukuran Tekanan Sumur (Format).
- Tekanan Dasar Sumur (Format).
- Oil Analysis, Laboratory report No.16/75
- Gas Analysis, Laboratory report No.17/75
- Laboratorium Eksploitasi Analisa Air (Format).

- POSPIUT Eindraport No.1 Pladju T.Tiga, 10 Nop. 1955
- Laporan Pengukuran Tekanan Sumur Timur EB-3 9-10-1975.
- Spuiter, Gaslift of Gasboiler 22 Jan 1951
  Eindraport No.1 put No.31 T.Jimar.
- Laporan Pengasaan No.II EB-3 Tanggal 19-10-1975.
- Sumur No. EB-3 Lapisan-H 9-10-1975.
- Laporan Reparasi/Pembaharuan Linau SA-22 9-8-1977 1 page.
- Analisa Air Prabumulih SPP 17-9-1973.
- Drill Stem Test Report P.N.PERTAMINA Djambi, Pagar Dewa
  Well No.1, No.6 Date 19-6-1968.
- Hasil Pengetesan Kapasitas Produksi Sumur Explorasi Benakat
  Timur EB-3 12-1-1973.
- Kemiringan Lubang Dan Penyimpangan Mendatar Dan Kedalaman
  Sebenarnya Sumur EB-3 5 Mei 1973.
- Cutting Report P.N.PERTAMINA
  Djambi, Pagar Dewa 1 No.9
- Laporan Contoh Inti-Samping
  Dide Wall Sample Report
  Plaju, Prabumulih, EB 1 page from 1401 m - 1376,5 m.
- Core Report Djambi Pagar Dewa
  13-5-68 1836 m - 1837,70 1 page.

3). Inventarisasi Drilling Equipment Rig (Format).

4). Keadaan Sumur Pada Akhir December 1977
Tanjung Miring Barat/Timur.

5). Data Perhitungan Volumetris Lapangan (Format).

6. Cadangan Minyak Lapangan (Format).

7). Laporan Harian Minyak dan Gas (Format).

8). Laporan Bulanan Sumur2 Penghasil HAL-29
PERTAMINA UNIT EP-II
BULANAN - OKTOBER 1978
LAPANGAN 213.

9). Laporan Data2 Produksi Per Reservoir HAL-37
PERTAMINA WILAYAH-II
BULANAN - AUGUST
LAPANGAN 213.

10). Laporan Bulanan Sumur2 Penghasil Per Station Pengumpul
PERTAMINA UNIT EP-II
BULANAN - SEPTEMBER 1978
LAPANGAN 213.

11). Laporan Bulanan Sumur2 Penghasil Gas Per Station Pengumpul
PERTAMINA UNIT EP-II
BULANAN - OKTOBER 1978.
LAPNGAN 100.

12). List of Reservoir Data Book Content.

13). Kode Reservoir.

14). Flowing Items of Daftar Buku2 Dan Laporan di Perpustakaan
Bahagian Production Engineering dan Reservoir Engineering
PERTAMINA WILAYAH-II PLAJU.
- ISI
- Keterangan.

15). Well Status Versus Crude Oil Production
Dec-75, Dec-76, Dec-77. (Format Only)

16). Following Items in "Daftar Laporan2 Eksplorasi dan Buku2/Madjallah
di PERPUSTAKAAN BAHAGIAN EKSPLORASI P.N.PERTAMINA UNIT-II PLAJU"
- Bal No. 13

17). Technical Information.

a. MEMORANDUM 016/INP/76
LAPORAN HASIL PEMERIKSAAN EQUIPMENT DI TEST UNIT UNJUJI-LAMPUNG.

b. LAPORAN PEMERIKSAAN BEJANA 019/INP/75

c. LAPORAN PENGETESAN PIPA No.015/INP/75

d. MEMORANDUM Arsp 057/INP/75.

e. MEMORANDUM Arsip 058/UPP/1977.

f. MEMORANDUM Arsip 059/UPP/1977.

g. - Format of Permohonan Otorisasi.
- Pemakaian Anggaran Kapital.
- Format of Permohonan Anggaran Biaya Kapital.
- Penjelasan Dari Usul Anggaran.

h. - Example of Daftar Perkiraan.
- Example of Bill of Material.

i. Example of "Equipment Inventary" - Production Fasilities - Page 4, 7, 8, 16, 20, 22, 32, 37, 41, 43.

j. Example of "Equipment Inventary" - DATA ALAT PRODUKSI - One page example per each equipment (total 33 pages).

k. LAPORAN MINGGUAN LAPANGAN2 LOKASI, Prabumulih 14-10-1978.

l. LAPORAN MINGGUAN KEADAAN & PENEMPATAN ALAT2 BERAT B.JARAN Prabumulih 10-11-1978.

m. EXAMPLES OF Material and Equipment Standard Code "Cocks & Valves" 75, 37, 45 354/362
75, 37, 43 312/828

n. ALAT PROD BOR PERLENGKAPAN

(Example of output sheet for material and equipment code)

057700 00 0602 P6

o. General Index to M.E.S.C. 1976

- Cover
- Table for SI conversions
- Introduction to the general index to MESC
- List of groups 2 pages
- Clossary of Abbreviations 9 pages
- Clossary of SI Units for use by Group Companies 2 pages

4. Computer System.

1). Information of Input item for the Folloving Application Programs.

a. M R P W + P D R .
b. RESERVE OIL & CONDENSATE.
c. LOGGING.
d. FLOWING BOTTOM HOLE PRESSURE.
e. STATIC.
f. SHILTHUIS MATERIAL BALANCE.
g. GAS DELIVERABILITY & ECONOMIC EVALUATION.
h. TRANER METHOD MATERIAL BALANCE.
i. DECLINE PRODUCTION.
j. FACTOR.
k. CASING DESIGN.
l. GEOGRAFIC POLYEDER CONVERSION.
m. DRILLING MATERIAL.
n. DRILLING COST.

2). Flow of Document.

3). PDE Utilities name.

4). VSI Standard and Optional Features.

5). Hardware configuration.