

3-5 E-Production Data Information

Eighty five of statistical output reporting methods are conceived relating to this data information group, which are referred to the page AI-104 of Appendix I.

For the convenience of utilization, these are classified into following twenty two groups.

- (1) Monthly Oil & Total Condensate and Total Gas Production
- (2) Monthly Oil, Gas Cap Condensate and Non Associated Condensate Production
- (3) Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production
- (4) Monthly Solution Gas, Gas Cap Gas and Non Associated Gas Production
- (5) Historical Monthly Oil & Total Condensate and Total Gas Production
- (6) Historical Monthly Oil, Gas Cap Condensate and Non Associated Condensate Production
- (7) Historical Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production
- (8) Historical Monthly Solution Gas, Gas Cap Gas and Non Associated Gas Production
- (9) Monthly Water Injection
- (10) Monthly Gas Injection
- (11) Historical Monthly Water Injection

- (12) Historical Monthly Gas Injection
- (13) Monthly Gas Production and Consumption
- (14) Historical Monthly Gas Production and Consumption
- (15) Monthly Oil Consumption
- (16) Historical Monthly Oil Consumption
- (17) Well Status Report for all Wells
- (18) Well Status Report for Producer
- (19) Well Status Report for Injector
- (20) Well Status Report for Shut-in Well
- (21) Well Status Report for Waiting Well
- (22) Well Status of Reservoir Unit

Assignment parameters for these output reporting methods are as follows.

- Area name
- Facilities field name
- Field name
- Block station name
- Well name
- Formation name
- Reservoir unit name
- String name
- Kind of completed zone
- Well status

- Kind of reservoir
- Kind of pressure for gas
- Water cut
- Gas-oil ratio
- Kind of injection fluid
- Period

Remarks are made relating to the above as follows.

1) Followings are conceived as a string name.

- Short length tubing (S)
- Middle length tubing (M)
- Long length tubing (L)
- Annulus (A)

In case that the well with name of TMT-100 has two tubings, the well name is to be repeated at output in the form of TMT-100S and TMT-100L together with related data as if there were two wells.

2) A certain range is to be assigned as to such assignment parameters as water cut and gas-oil ratio. As a result, well or string with the data of which the value falls in the range is to be retrieved together with the related data.

3) Production data corresponding to the period assigned is to be retrieved together with the related data.

A description is made relating to the purpose and function of the methods by groups aforementioned as follows.

(1) Monthly Oil & Total Condensate and Total Gas Production

E1 Monthly Oil & Total Condensate and Total Gas
Production by Field

E2 Monthly Oil & Total Condensate and Total Gas
Production by Block Station

E3	Monthly Oil & Total Condensate and Total Gas Production by Well
E4	Monthly Oil & Total Condensate and Total Gas Production for Formation by Field
E5	Monthly Oil & Total Condensate and Total Gas Production by Reservoir Unit
E6	Monthly Oil & Total Condensate and Total Gas Production by Well by Block Station
E7	Monthly Oil & Total Condensate and Total Gas Production by Reservoir Unit by Well
E8	Monthly Oil & Total Condensate and Total Gas Production by Well by Reservoir Unit

These are designed for the purpose of grasping statistically the monthly total liquid (oil and condensate) and the monthly total gas (solution gas, gas cap gas and non associated gas) production.

Followings are data items for the respective methods of E1 - E8 respectively.

Item name	E1	E2	E3	E4	E5	E6	E7	E8
- Year, month	o	o	o	o	o	o	o	o
- Area name	o	o	o	o	o	o	o	o
- Facilities field name	x	o	x	x	x	o	x	x
- Field name	o	x	o	o	o	x	o	o
- Block station name	x	o	o	x	x	o	o	o
- Well name	x	x	x	o	x	x	o	o
- Formation name	x	x	x	o	o	x	x	x
- Reservoir Unit	x	x	x	x	o	x	o	o
- Average daily production	o	o	o	o	o	o	o	o
- Oil and total condensate								
- Total gas								
- Water cut								
- Average daily injection gas by gas lift	o	x	o	x	x	o	x	x

Item name	E1	E2	E3	E4	E5	E6	E7	E8
- Monthly production								
- Oil & total condensate	o	o	o	o	o	o	o	o
- Total gas	o	o	o	o	o	o	o	o
- Gas oil ratio	o	o	x	o	o	o	o	o
- Water	o	x	x	o	o	x	x	x
- Cumulative production								
- Oil & total condensate	o	o	o	o	o	o	o	o
- Total gas	o	o	o	o	o	o	o	o
- Water	o	x	o	o	o	x	x	x
- Number of producers	o	o	x	o	o	x	x	x
- Block station name	x	o	o	x	x	o	o	o
- String name	x	x	o	x	x	o	o	o
- Workover number	x	x	o	x	x	o	o	o
- Kind of completed zone	x	x	o	x	x	o	o	o
- Well status	x	x	o	x	x	o	o	o
- Layer name	x	x	o	x	o	o	o	o
- Share factor	x	x	x	x	x	x	o	o
- Choke size	x	x	o	x	x	o	o	o
- Tubing pressure	x	x	o	x	x	o	o	o
- Casing pressure	x	x	o	x	x	o	o	o
- Separator pressure	x	x	o	x	x	o	o	o
- Production days	x	x	o	x	x	o	o	o
- Historical production Months	x	x	o	x	x	o	o	o

Table in the page 132 shows the unit output data items and the methods of statistics for the respective methods of E1 - E8.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E1 - E8.

Output Reporting method	Assignment parameter	Assignment Parameter for Common Use
E1		Area name String name Kind of Completed zone Well status Water cut Gas-oil ratio Kind of Reservoir Period
E2	Facilities field name	
E3	Field name	
E4	Formation name	
E5	Field name	
E6	Facilities field name	
E7	Field name	
E8	Field name	

As for E4, in case that Jambi is assigned by the assignment parameter of "Area name", total production related to the assigned formation is to be calculated and output by fields in Jambi according to the other assignment parameters.

(2) Monthly Oil, Gas Cap Condensate and Non Associated Condensate Production

E9 Monthly Oil, Gas Cap Condensate and Non Associated Condensate Production by Field

E10 Monthly Oil, Gas Cap Condensate and Non Associated Condensate Production by Block Station

E11 Monthly Oil, Gas Cap Condensate and Non Associated Condensate Production for Formation by Field

E12 Monthly Oil, Gas Cap Condensate and Non Associated Condensate Production by Reservoir unit

These are designed for the purpose of grasping statistically the monthly oil, gas cap condensate and Non associated condensate production.

Following are data items for the respective methods of E9 - E12.

Item name	E9	E10	E11	E12
- Year, month	o	o	o	o
- Area name	o	o	o	o
- Facilities field name	x	o	x	x
- Field name	o	x	o	o
- Block station name	x	o	x	x
- Formation name	x	x	o	x
- Reservoir unit	x	x	x	x
- Layer name	x	x	x	o
- Average daily production	o	o	o	o
- Oil				
- Gas Cap Condensate				
- Non Associated condensate				
- Monthly production	o	o	o	o
- Oil				
- Gas Cap condensate				
- Non Associated condensate				
- Cumulative production	o	o	o	o
- Oil				
- Gas Cap condensate				
- Non Associated condensate				

Table in the page 132 shows the unit output data items and the methods of statistics for the respective methods of E9 - E12.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E9 - E12.

Output reporting method	Assignment parameter	Assignment parameter for common use
E9		Area name
E10	Facilities field name	String name
E11	Formation name	Well status
E12	Field name	Water cut
		Gas-oil ratio
		Kind of reservoir
		Period

As for E11, in case that Jambi is assigned by the assignment parameter of "Area name", total production related to the assigned formation is to be calculated and output by fields in Jambi according to the other assignment parameters.

(3) Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production

E13 Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production by Field

E14 Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production by Block Station

E15 Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production by Well

E16 Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas by Well by Block Station

E17 Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production for Formation by Field

E18 Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production by Reservoir Unit

These are designed for the purpose of grasping statistically monthly high pressure gas, medium pressure gas and low pressure gas production.

Followings are data items for the respective methods of E13 - E18.

Item name	E13	E14	E15	E16	E17	E18
- Year, month	o	o	o	o	o	o
- Area name	o	o	o	o	o	o
- Facilities field name	x	o	x	o	x	x
- Field name	o	x	o	x	o	o
- Block station name	x	o	o	o	x	x
- Well name	x	x	o	o	x	x
- Workover number	x	x	o	o	x	x
- String name	x	x	o	o	x	x
- Production days	x	x	o	o	x	x
- Kind of completed zone	x	x	o	o	x	x
- Well status	x	x	o	o	x	x
- Choke size	x	x	o	o	x	x
- Formation name	x	x	x	x	o	x
- Reservoir unit	x	x	x	x	x	o
- Layer name	x	x	o	o	x	o
- Average daily production	o	o	o	o	o	o
- High pressure gas						
- Medium pressure gas						
- Low pressure gas						
- Monthly production	o	o	o	o	o	o
- High pressure gas						
- Medium pressure gas						
- Low pressure gas						
- Cumulative production	o	o	o	o	o	o
- High pressure gas						
- Medium pressure gas						
- Low pressure gas						
- Definition of high, medium and low pressure gas	o	o	o	o	o	o

Table in the page 133 shows the unit output data items and the methods of statistics for the respective methods of E13 - E18.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E13 - E18.

Output reporting method	Assignment parameter	Assignment parameter for common use
E13		Area name String name Kind of completed zone Well status Water cut Gas-oil ratio Kind of reservoir Period
E14	Facilities field name	
E15	Field name	
E16	Field name, Block station name	
E17	Formation name	
E18	Field name	

As for E17, in case that Jambi is assigned by the assignment parameter of "Area name", total production related to the assigned formation is to be calculated and output by fields in Jambi according to the assignment parameters.

(4) Monthly Solution Gas, Gas Cap Gas and Non Associated Gas Production

E19 Monthly Solution Gas, Gas Cap Gas and Non Associated Gas Production by Field

E20 Monthly Solution Gas, Gas Cap Gas and Non Associated Gas Production by Block Station

E21 Monthly Solution Gas, Gas Cap Gas and Non Associated Gas Production for Formation by Field

E22 Monthly Solution Gas, Gas Cap Gas and Non Associated Gas Production by Reservoir Unit

These are designed for the purpose of grasping statistically the monthly solution gas, gas cap gas and Non Associated gas production.

Following are data items for the respective methods of E19 - E22.

Item No.	E19	E20	E21	E22
- Area name	o	o	o	o
- Facilities field name	x	o	x	x
- Field name	o	x	o	o
- Block station name	x	o	x	x
- Formation name	x	x	o	x
- Reservoir unit	x	x	x	o
- Layer name	x	x	x	o
- Average daily production	o	o	o	o
- Solution gas				
- Gas cap gas				
- Non Associated gas				
- Monthly production	o	o	o	o
- Solution gas				
- Gas cap gas				
- Non Associated gas				
- Cumulative production	o	o	o	o
- Solution gas				
- Gas cap gas				
- Non Associated gas				

Table in the page 133 shows the unit output items and the methods of statistics for the respective methods of E19 - E22.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E19 - E22.

Output reporting method	Assignment parameter	Assignment parameter for common use
E19		Area name String name Well Status Water cut Gas-oil ratio Kind of reservoir King of pressure for gas Period
E20	Facilities field name	
E21	Formation name	
E22	Field name	

As for E21, in case that Jambi is assigned by the assignment parameter of "Area name", total production related to the assigned formation is to be calculated and output by fields in Jambi according to the other assignment parameters.

(5) Historical Monthly Oil & Total Condensate and Total Gas Production

E23	Historical Monthly Oil, Total Condensate and Total Gas Production for Area
E24	Historical Monthly Oil, Total Condensate and Total Gas Production for Field
E25	Historical Monthly Oil, Total Condensate and Total Gas Production for Block Station
E26	Historical Monthly Oil, Total Condensate and Total Gas Production for Well

E27 Historical Monthly Oil, Total Condensate and Total Gas Production for Formation

E28 Historical Monthly Oil, Total Condensate and Total Gas Production for Reservoir Unit

These are designed for the purpose of grasping the historical monthly total liquid (oil and condensate) and monthly total gas (solution gas, gas cap gas and Non Associated gas) production.

Followings are data items for the respective methods of E23 - E28 respectively.

Item name	E23	E24	E25	E26	E27	E28
- Year, month	o	o	o	o	o	o
- Area name	o	o	o	o	o	o
- Facilities field name	x	x	o	x	x	x
- Field name	x	o	x	o	o	o
- Block station name	x	x	o	o	x	x
- Well name	x	x	x	o	x	x
- Formation name	x	x	x	x	o	x
- Reservoir unit	x	x	x	o	x	o
- Average daily production						
- Oil & total condensate	o	o	o	o	o	o
- Total gas	o	o	o	o	o	o
- Gas oil ratio	o	o	o	x	o	o
- Water cut	o	o	o	o	o	o
- Average daily injection gas by gas lift	o	o	x	o	x	x
- Monthly production						
- Oil & total condensate	o	o	o	o	o	o
- Total gas	o	o	o	o	o	o
- Water	o	o	x	x	o	o
- Cumulative production						
- Oil & total condensate	o	o	o	o	o	o
- Total gas	o	o	o	o	o	o
- Water	o	o	x	o	o	o

Item name	E23	E24	E25	E26	E27	E28
- Number of producers	0	0	0	x	0	0
- Block station name	x	x	0	0	x	x
- String name	x	x	x	0	x	x
- Workover number	x	x	x	0	x	x
- Kind of completed zone	x	x	x	0	x	x
- Well status	x	x	x	0	x	x
- Layer name	x	x	x	0	x	0
- Share factor	x	x	x	x	x	x
- Choke size	x	x	x	0	x	x
- Tubing pressure	x	x	x	0	x	x
- Casing pressure	x	x	x	0	x	x
- Separator pressure	x	x	x	0	x	x
- Production days	x	x	x	0	x	x
- Historical production months	x	x	x	0	x	x

Table in the page 134 shows the unit output data items and the methods of statistics for the respective methods of E23 - E28.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E23 - E28.

Output reporting method	Assignment parameters	Assignment parameter for common use
E23	Area name, String name Kind of completed zone, Well status, Water cut, Gas-oil ratio, Kind of reservoir	
E24	Field name, String name, Kind of completed zone, Well status, Water cut, Gas-oil ratio, Kind of reservoir	Period
E25	Block station name, String name, Kind of completed zone, Well status, Water cut, Gas-oil ratio, Kind of reservoir	
E26	Well name	
E27	Formation name, Area name, Field name, String name, Kind of completed zone, Well status, Water cut, Gas-oil ratio Kind of reservoir	
E28	Reservoir unit name, String name, Kind of Completed zone, Well status, Water cut, Gas-oil ratio	

For example, as for E23, the production history of the assigned area is to be retrieved and output. Area names more than two each can be assigned simultaneously.

As for E26, in case that the well has two tubings, sum of production from two tubings is calculated and output as the well production. Each string has a kind of completed zone and a well status. In this case, well has two kinds of completed zone and two well status, and these data are output by strings as the well information.

As for E27, in case that Jambi is assigned by the assignment parameter of "Area name", the production history of the assigned formation in Jambi area is retrieved and output, while in case that a specific field name is assigned by the assignment parameter of "Field name", the production history of the assigned formation in the field is retrieved and output.

(6) Historical Monthly Oil, Gas Cap Condensate and Non Associated Condensate Production

E29	Historical Monthly Oil, Gas Cap Condensate and Non Associated Condensate Production for Area
E30	Historical Monthly Oil, Gas Cap Condensate and Non Associated Condensate Production for Field
E31	Historical Monthly Oil, Gas Cap Condensate and Non Associated Condensate Production for Block Station
E32	Historical Monthly Oil, Gas Cap Condensate and Non Associated Condensate Production for Formation
E33	Historical Monthly Oil, Gas Cap Condensate and Non Associated Condensate Production for Reservoir Unit

These are designed for the purpose of grasping the historical monthly oil, gas cap condensate and Non Associated condensate production.

Followings are data items for the respective methods of E29 - E33.

Item name	E29	E30	E31	E32	E33
- Year, month	o	o	o	o	o
- Area name	o	o	o	o	o
- Facilities field name	x	x	o	x	x
- Field name	x	o	x	o	o
- Block station name	x	x	o	x	x
- Formation name	x	x	x	o	x
- Reservoir unit	x	x	x	x	o
- Layer name	x	x	x	x	o
- Average daily production	o	o	o	o	o
- Oil					
- Gas cap condensate					
- Non Associated condensate					
- Monthly production	o	o	o	o	o
- Oil					
- Gas cap condensate					
- Non Associated condensate					
- Cumulative production	o	o	o	o	o
- Oil					
- Gas cap condensate					
- Non Associated condensate					

Table in the page 135 shows the unit output data items and the methods of statistics for the respective methods of E29 - E33.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E29 - E33.

Output reporting method	Assignment parameter	Assignment parameter for common use
E29	Area name, Kind of reservoir	String name Well status
E30	Field name, Kind of reservoir	Water cut Gas-oil ratio Period
E31	Block station name, Kind of reservoir	
E32	Formation name, Area name, Field name, Kind of reservoir	
E33	Reservoir unit name	

(7) Historical Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production

- E34 Historical Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production for Area**
- E35 Historical Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production for Field**
- E36 Historical Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production for Block Station**
- E37 Historical Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production for Well**
- E38 Historical Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production for Formation**
- E39 Historical Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production for Reservoir Unit**

These are designed for purpose of grasping the historical monthly high pressure gas, medium pressure gas and low pressure gas production.

Followings are data items for the respective methods of E34 - E39.

Item name	E34	E35	E36	E37	E38	E39
- Year, month	o	o	o	o	o	o
- Area name	o	o	o	o	o	o
- Facilities field name	x	x	o	x	x	x
- Field name	x	o	x	o	o	o
- Block station name	x	x	o	o	x	x
- Well name	x	x	x	o	x	x
- Workover number	x	x	x	o	x	x
- String name	x	x	x	o	x	x
- Production days	x	x	x	o	x	x
- Kind of completed zone	x	x	x	o	x	x
- Well status	x	x	x	o	x	x
- Choke size	x	x	x	o	x	x
- Formation name	x	x	x	x	o	x
- Reservoir unit	x	x	x	x	x	o
- Layer name	x	x	x	o	x	o
- Average daily production	o	o	o	o	o	o
- High Pressure gas						
- Medium pressure gas						
- Low pressure gas						
- Monthly production	o	o	o	o	o	o
- High pressure gas						
- Medium pressure gas						
- Low pressure gas						
- Cumulative production	o	o	o	o	o	o
- High pressure gas						
- Medium pressure gas						
- Low pressure gas						
- Definition of high, medium and low pressure gas	o	o	o	o	o	o

Table in the page 135 shows the unit output data items and the methods of statistics for the respective methods of E34 - E39.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E34 - E39.

Output reporting method	Assignment parameters	Assignment parameter for common use
E34	Area name Kind of reservoir String name Kind of completed zone Well status Water cut Gas-oil ratio	Period
E35	Field name Kind of reservoir String name Kind of completed Zone Well status Water cut Gas-oil ratio	
E36	Block station name Kind of reservoir String name Kind of completed zone Well status Water cut Gas-oil ratio	
E37	Well name	

Output reporting method	Assignment parameters	Assignment parameter for common use
E38	Formation name Area name Field name Kind of reservoir String name Kind of completed zone Well status Water cut Gas-oil ratio	
E39	Reservoir unit name String name Kind of completed zone Well status Water cut Gas-oil ratio	

(8) Historical Monthly Solution Gas, Gas Cap Gas and Non Associated Gas Production

E40 Historical Monthly Solution Gas, Gas Cap Gas and Non Associated Gas Production for Area

E41 Historical Monthly Solution Gas, Gas Cap Gas and Non Associated Gas Production for Field

E42 Historical Monthly Solution Gas, Gas Cap Gas and Non Associated Gas Production for Block Station

E43 Historical Monthly Solution Gas, Gas Cap Gas and Non Associated Gas Production for Formation

E44 Historical Monthly Solution Gas, Gas Cap Gas and Non Associated Gas Production for Reservoir Unit

These are designed for the purpose of grasping the historical monthly solution gas, gas cap gas and Non Associated gas production.

Followings are data items for the respective methods of E40 - E44.

Item name	E40	E41	E42	E43	E44
- Area name	o	o	o	o	o
- Facilities field name	x	x	o	x	x
- Field name	x	o	x	o	o
- Block station name	x	x	o	x	x
- Formation name	x	x	x	o	x
- Reservoir unit	x	x	x	x	o
- Layer name	x	x	x	x	o
- Average daily production	o	o	o	o	o
- Solution gas					
- Gas cap gas					
- Non Associated gas					
- Monthly production	o	o	o	o	o
- Solution gas					
- Gas cap gas					
- Non Associated gas					
- Cumulative production	o	o	o	o	o
- Solution gas					
- Gas cap gas					
- Non Associated gas					

Table in the page 136 shows the unit output data items and the methods of statistics for the respective methods of E40 - E44.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E40 - E44.

Output reporting method	Assignment parameters	Assignment parameter for common use
E40	Area name Kind of reservoir	String name Well status
E41	Field name Kind of reservoir	Water cut Gas-oil ratio Kind of pressure for gas
E42	Block station name Kind of reservoir	Period
E43	Formation name Area name, Field name Kind of reservoir	
E44	Reservoir unit name	

(9) Monthly Water Injection

E45 Monthly Water Injection by Field

E46 Monthly Water Injection by Well

E47 Monthly Water Injection for Formation by Field

E48 Monthly Water Injection by Reservoir Unit

E49 Monthly Water Injection by Reservoir Unit by Well

E50 Monthly Water Injection by Well by Reservoir Unit

These are designed for the purpose of grasping statistically the monthly water injection.

Followings re data items for the respective methods of E45 - E50.

Item name	E45	E46	E47	E48	E49	E50
- Year, month	o	o	o	o	o	o
- Area name	o	o	o	o	o	o
- Field name	o	o	o	o	o	o
- Well name	x	o	x	x	o	o
- String name	x	o	x	x	o	o
- Workover number	x	o	x	x	o	o
- Formation name	x	x	o	o	x	o
- Reservoir unit	x	x	x	o	o	o
- Average daily injection	o	o	o	o	o	o
- Monthly injection	o	o	o	o	o	o
- Cumulative injection	o	o	o	o	o	o
- Number of injectors	o	x	o	o	x	x
- Kind of completed zone	x	o	x	x	o	o
- Well status	x	o	x	x	o	o
- Layer name	x	o	x	o	o	o
- Share factor	x	x	x	x	o	o
- Wellhead injecting pressure	x	o	x	x	o	o
- Kind of injection fluid	x	o	x	x	o	o
- With or without filtration	x	o	x	x	o	o
- With or without additives	x	o	x	x	o	o
- Injection days	x	o	x	x	o	o
- Historical injection months	x	o	x	x	o	x

Table in the page 136 shows the unit output data items and the methods of statistics for the respective methods of E45 - E50.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E45 - E50.

Output reporting method	Assignment parameter	Assignment parameter for common use
E45		Area name, String name Kind of completed zone Well status Kind of injection fluid Kind of reservoir Period
E46	Field name	
E47	Formation name	
E48	Field name	
E49	Field name	
E50	Field name	

Followings re conceived as a kind of injection fluid (refer to APPENDIX III) in this group.

- Fresh water
- Sea water
- Formation water
- Other kind of water

As for E47, in case that Jambi is assigned by the assignment parameter of "Area name", total injection related to the assigned formation is to be calculated and output by fields in Jambi according the other assignment parameters.

(10) Monthly Gas Injection

E51 Monthly Gas Injection by Field

E52 Monthly Gas Injection by Well

E53 Monthly Gas Injection for Formation by Field

E54 Monthly Gas Injection by Reservoir Unit

E55 Monthly Gas Injection by Reservoir Unit by Well

E56 Monthly Gas Injection by Well by Reservoir Unit

These are designed for the purpose of grasping statistically the monthly gas injection.

Followings are data items for the respective methods of E51 - E56.

Item name	E51	E52	E53	E54	E55	E56
- Year, month	o	o	o	o	o	o
- Area name	o	o	o	o	o	o
- Field name	o	o	o	o	o	o
- Well name	x	o	x	x	o	o
- String name	x	o	x	x	o	o
- Workover number	x	o	x	x	o	o
- Formation name	x	x	o	o	x	x
- Reservoir unit	x	x	x	o	o	o
- Average daily production	o	o	o	o	o	o
- Monthly injection	o	o	o	o	o	o
- Cumulative injection	o	o	o	o	o	o
- Number of injectors	o	x	o	o	x	x
- Kind of completed zone	x	o	x	x	o	o
- Well status	x	o	x	x	o	o
- Layer name	x	o	x	o	o	o
- Share factor	x	x	x	x	o	o
- Wellhead injecting pressure	x	o	x	x	o	o
- Kind of injection fluid	x	o	x	x	o	o
- Injection days	x	o	x	x	o	o
- Historical injection months	x	o	x	x	o	o

Table in the page 137 shows the unit output data items and the method of statistics for the respective methods of E51 - E56.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above method of statistics and the following assignment parameters for the respective output reporting methods of E51 - E56.

Output reporting method	Assignment parameter	Assignment parameter for common use
E51		Area name String name Kind of completed zone Well status Kind of injection fluid Kind of reservoir Period
E52	Field name	
E53	Formation name	
E54	Field name	
E55	Field name	
E56	Field name	

Followings are conceived as a kind of injection fluid (refer to APPENDIX III) in this group.

- Wet gas
- Dry gas
- CO₂
- Air

As for 53, in case that Jambi is assigned by the assignment parameter of "Area name", total injection related to the assigned formation is to be calculated and output by fields in Jambi according to the other assigned parameters.

(11) Historical Monthly Water Injection

- E57 Historical Monthly Water Injection for Area
- E58 Historical Monthly Water Injection for Field
- E59 Historical Monthly Water Injection for Well
- E60 Historical Monthly Water Injection for Formation
- E61 Historical Monthly Water Injection for Reservoir Unit

These are designed for the purpose of grasping the historical monthly water injection.

Followings are data items for the respective methods of E57 - E61.

Item name	E57	E58	E59	E60	E61
- Year, month	o	o	o	o	o
- Area name	o	o	o	o	o
- Field name	x	o	o	o	o
- Well name	x	x	o	x	x
- String name	x	x	o	x	x
- Workover number	x	x	o	x	x
- Formation name	x	x	x	o	o
- Reservoir unit	x	x	o	x	o
- Average daily injection	o	o	o	o	o
- Monthly injection	o	o	o	o	o
- Cumulative injection	o	o	o	o	o
- Number of injectors	o	o	x	o	o
- Kind of completed zone	x	x	o	x	x
- Well status	x	x	o	x	x
- Layer name	x	x	o	x	x
- Share factor	x	x	o	x	x
- Wellhead injecting pressure	x	x	o	x	x
- Kind of injection fluid	x	x	o	x	x
- With or without filtration	x	x	o	x	x
- With or without additives	x	x	o	x	x
- Injection days	x	x	o	x	x
- Historical injection months	x	x	o	x	x

Table in the page 137 shows the unit output data items and the methods of statistics for the respective methods of E57 - E61.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E57 - E61.

Output reporting method	Assignment parameter	Assignment parameter for common use
E57	Area name, String name Kind of completed zone Well status, Kind of injection fluid, Kind of reservoir	
E58	Field name, String name Kind of completed zone Well status, Kind of injection fluid, Kind of reservoir	
E59	Well name, Kind of reservoir	Period
E60	Formation name, Area name, Field name, String name, Kind of Completed zone, Well status, Kind of injection fluid, Kind of reservoir	
E61	Reservoir unit name String name, Kind of Completed zone, Well status, Kind of injection fluid	

(12) Historical Monthly Gas Injection

E62 Historical Monthly Gas Injection for Area

E63 Historical Monthly Gas Injection for Field

E64 Historical Monthly Gas Injection for Well

E65 Historical Monthly Gas Injection for Formation

E66 Historical Monthly Gas Injection for Reservoir Unit

These are designed for the purpose of grasping historically the monthly gas injection.

Followings are data items for the respective methods of E62 - E66.

Item name	E62	E63	E64	E65	E66
- Year, month	o	o	o	o	o
- Area name	o	o	o	o	o
- Field name	x	o	o	o	o
- Well name	x	x	o	x	x
- String name	x	x	o	x	x
- Workover number	x	x	o	x	x
- Formation name	x	x	x	o	o
- Reservoir unit	x	x	o	x	o
- Average daily injection	o	o	o	o	o
- Monthly injection	o	o	o	o	o
- Cumulative injection	o	o	o	o	o
- Number of injectors	o	o	x	o	o
- Kind of completed zone	x	x	o	x	x
- Well status	x	x	o	x	x
- Layer name	x	x	o	x	o
- Share factor	x	x	o	x	x
- Wellhead injecting pressure	x	x	o	x	x
- Kind of injecting fluid	x	x	o	x	x
- Injection days	x	x	o	x	x
- Historical injection months	x	x	o	x	x

Table in the page 138 shows the unit output data items and the methods of statistics for the respective methods of E62 - E66.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E62 - E66.

Output reporting method	Assignment parameter	Assignment parameter for common use
E62	Area name, String name Kind of completed zone Well status, Kind of injection fluid Kind of reservoir	Period
E63	Field name, String name Kind of completed zone Well status, Kind of injection fluid Kind of reservoir	
E64	Well name, Kind of reservoir	
E65	Formation name, Area name, String name, Kind of completed zone Well status, Kind of injection fluid, Kind of reservoir	
E66	Reservoir unit name, String name, Kind of Completed zone, Well status, Kind of injection fluid	

(13) Monthly Gas Production and Consumption

E67 Monthly Gas Production and Consumption by Area

E68 Monthly Gas Production and Consumption by Field

There are designed for the purpose of grasping the monthly gas production and consumption.

Followings are data items for the respective methods of E67 and E68.

Item name	E67	E68
- Area name	o	o
- Field name	o	o
- Gas production (Associated gas (High pressure gas, Medium pressure gas, Low pressure gas) and Non associated gas (High pressure gas, Medium pressure gas, Low pressure gas)).	o	o
- Gas consumption (Associated gas (High pressure gas, Medium pressure gas, Low pressure gas) and Non associated gas (High pressure gas, Medium pressure gas, Low pressure gas)).	o	o
- Own use		
- Fuel		
- Injection gas		
- Gas lift		
- Compressor		
- Utilities		
- Process		
- LPG plant		
- LNG plant		
- Fertilize plant		
- Pusri II		
- Pusri III		
- Pusri IV		

Item name

E67 E68

- Refinery
 - Plaju
 - S. Gergon
 - Polypropylène
 - Aromatic
- Sales
 - City gas
 - Public utility
- Flare and loss
 - Flare
 - Loss

Table in the page 138 shows the unit output data items and the methods of statistics for the respective methods of E67 and E68.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E67 and E68.

Output reporting method	Assignment parameter	Assignment parameter for common use
E67		Period
E68	Area name	

(14) Historical Monthly Gas Production and Consumption

E69	Historical Monthly Gas Production and Consumption for Unit II
E70	Historical Monthly Gas Production and Consumption for Area
E71	Historical Monthly Gas Production and Consumption for Field

These are designed for the purpose of grasping the historical monthly gas production and consumption.

Followings are data items for the respective methods of E69 - E71.

Item name	E69	E70	E71
- Area name	o	o	o
- Field name	o	o	o
- Gas production (Associated gas (High pressure gas, Medium pressure gas, Low pressure gas) and Non associated gas (High pressure gas, Medium pressure gas, Low pressure gas)).	o	o	o
- Gas consumption (Associated gas (High pressure gas, Medium pressure gas, Low pressure gas) and Non associated gas (High pressure gas, Medium pressure gas, Low pressure gas))	o	o	o
- Own use			
- Fuel			
- Injection gas			
- Gas lift			
- Compressor			
- Utilities			
- Process			
- LPG plant			
- LNG plant			
- Fertilize plant			

(15) Monthly Oil Consumption

E72 Monthly Oil Consumption by Area

This is designed for the purpose of grasping the monthly oil consumption.

Followings are data items for this method.

- Oil consumption
 - Refinery Plaju
 - Gross
 - Water cut
 - Net
 - Specific gravity
 - Sub total
 - Field used
 - Road maintenance
 - Well servicing
 - Fuel
 - Other
 - Sub total
- Total

Table in the page 139 shows the unit output data items and the method of statistics for E72.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above method of statistics and the following assignment parameter for the output reporting method of E72.

- Period

(16) Historical Monthly Oil Consumption

E73 Historical Monthly Oil Consumption for Unit II

E74 Historical Monthly Oil Consumption for Area

These are designed for the purpose of grasping the historical monthly oil consumption.

Followings are data items for the respective methods of E73 and E74.

Item name	E73	E74
-----------	-----	-----

- | | | |
|--------------------|---|---|
| - Oil consumption | o | o |
| - Refinery Plaju | | |
| - Gross | | |
| - Water cut | | |
| - Net | | |
| - Specific gravity | | |
| - Sub total | | |
| - Field used | | |
| - Road maintenance | | |
| - Well servicing | | |
| - Fuel | | |
| - Other | | |
| - Sub total | | |
| - Total | | |

Table in the page 139 shows the unit output data items and the methods of statistics for the respective methods of E73 and E74.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E73 and E74.

Output reporting method	Assignment parameter	Assignment parameter for common use
E73		Period
E74	Area name	

(17) Well Status Report for All Wells

E75 Well Status Report for All Wells by Field

E76 Well Status Report for All Wells by Reservoir Unit

These are designed for the purposed of grasping statistically the number of wells and strings by well status.

Followings are data items for the respective method of E75 and E76.

Item name	E75	E76
- Area name	o	o
- Field name	o	o
- Reservoir unit	x	o
- Number of producers and strings	o	o
- Producing well		
- Shut-in well		
- Number of injectors and strings	o	o
- Injecting well		
- Shut-in well		
- Number of observation wells	o	o
- Number of waiting wells	o	o
- Number of suspended wells	o	o
- Number of abandoned wells	o	o

Table in the page 140 shows the unit output data items and the methods of statistics for the respective methods of E75 and E76.

The unit data for date items as mentioned in the previous part is to be retrieved and output according to the above method of statistics and the following assignment parameters for the respective output reporting method of E75 and E76.

Output reporting method	Assignment parameter	Assignment parameter for common use
E75		Area name String name Kind of completed zone
E76	Field name	Kind of reservoir Period

(18) Well Status Report for Producer

E77 Well Status Report for Producer by Field

E78 Well Status Report for Producer by Reservoir Unit

These are designed for the purpose of grasping statistically the number of producers and their strings by well status.

Followings are data items for the respective methods of E77 and E78.

Item name	E77	E78
- Area name	o	o
- Field name	o	o
- Reservoir unit	x	o
- Number of producing wells and their strings	o	o
- Natural flowing		
- Submergible pumping		
- Rod pumping		
- Gas lifting		
- Gas lifting with macaroni		
- Number of shut-in wells and their strings	o	o

Item name

E77 E78

- Ordinary string
- Submergible pump
- Rod pump
- Gas lift
- Gas lift with macaroni

Table in the page 140 shows the unit output data items and the methods of statistics for the respective methods of E77 and E78.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E77 and E78.

Output reporting method	Assignment parameter	Assignment parameter for common use
E77		Area name String name Kind of completed zone
E78	Field name	Kind of reservoir Period

(19) Well Status Report for Injector

E79 Well Status Report for Injector by Field

E80 Well Status Report for Injector by Reservoir Unit

These are designed for the purpose of grasping statistically the number of injectors and their strings by well status.

Following are data items for the respective methods of E79 and E80.

Item name	E79	E80
- Area name	o	o
- Field name	o	o
- Reservoir unit	x	o
- Number of injecting wells and their strings	o	o
- Dump flood water injection		
- Powered water injection		
- Gas injection		
- Number of shut-in injectors and their strings	o	o
- Dump flood water injection		
- Powered water injection		
- Gas injection		

Table in the page 140 shows the unit output data items and the methods of statistics for the respective methods of E79 and E80.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E79 and E80.

Output reporting method	Assignment parameter	Assignment parameter for common use
E79		Area name String name Kind of completed zone
E80	Field name	Kind of reservoir Period

(20) Well Status Report for Shut-in Well

E81 Well Status Report for Shut-in Well by Field

E82 Well Status Report for Shut-in Well by Reservoir Unit

These are designed for the purpose of grasping statistically the number of shut-in wells and their strings by well status.

Followings are data items for the respective methods of E81 and E82.

Item name	E81	E82
- Area name	o	o
- Field name	o	o
- Reservoir unit	x	o
- Number of shut-in producers and their strings	o	o
- Due to production schedule		
- Due to well service		
- Due to surface repair		
- Due to low pressure (Waiting for bottomhole pressure build-up)		
- Due to high gas-oil ratio		
- Due to high BS & W		
- Number of shut-in injectors and strings	o	o
- Due to injection schedule		
- Due to well service		
- Due to surface repair		

Table in the page 141 shows the unit output data items and the methods of statistics for the respective methods of E81 and E82.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E81 and E82.

Output reporting method	Assignment parameter	Assignment parameter for common use
E81		Area name String name Kind of completed zone
E82	Field name	Kind of reservoir Period

(21) Well Status Report for Waiting Well

E83 Well Status Report for Waiting Well by Field

E84 Well Status Report for Waiting Well by Reservoir Unit

These are designed for the purpose of grasping statistically the number of waiting wells by well status.

Followings are data items for the respective methods of E83 and E84.

Item name	E83	E84
- Area name	o	o
- Field name	o	o
- Reservoir unit	x	o
- Number of waiting producers	o	o
- For facilities		
- For workover		
- For stimulation		
- For abandonment		

Item name E83 E84

- Number of waiting injector 0 0
- For facilities
- For workover
- For stimulation
- For abandonment

Table in the page 141 shows the unit output data items and the methods of statistics for the respective methods of E83 and E84.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of E83 and E84.

Output reporting method	Assignment parameter	Assignment parameter for common use
E83		Area name String name Kind of completed zone
E84	Field name	Kind of reservoir Period

(22) Well Status of Reservoir Unit

E85 Well Status of Reservoir Unit

This is designed for the purpose of correlating the well status of reservoirs units which have been penetrated by wells.

The followings data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Area name
- Field name
- Reservoir unit name
- Kind of completed zone
- Well name
- Well Status

Assignment parameters to be applied to this method are "Field name", "Well name", "Reservoir unit name", "Kind of reservoir" and "Period". Twenty of reservoir unit names and their output orders can be assigned at most by one time execution. In case of correlation of reservoir unit names more than twenty each, therefore, executions more than two times are required for production of output. As for number of well names, it is unlimited and the output order for well name can be assignment.

OUTPUT METHOD

(1) Monthly Oil & Total Condensate and Total Gas Production

Output Method	The Unit Output Data Item	Method of Statistics
E1	Monthly Production of Field	By Area
E2	Monthly Production of Block Station	By Area, By Field Area
E3	Monthly Production of Well	By Area, By Field
E4	Monthly Production of Formation by Field	By Area
E5	Monthly Production of Reservoir Unit	By Area, By Field, By Formation in Field
E6	Monthly Production of Well	By Area, By Field Area, By Block Station
E7	Monthly Production of Reservoir Unit	By Area, By Field, By Well
E8	Monthly Production of Well	By Area, By Field, By Reservoir Unit

(2) Monthly Oil, Gas Cap Condensate and Nonassociated Condensate Production

Output Method	The Unit Output Data Item	Method of Statistics
E9	Monthly Production of Field	By Area,
E10	Monthly Production of Block Station	By Area, By Field Area
E11	Monthly Production of Formation in Field	By Area
E12	Monthly Production of Reservoir Unit	By Area, By Field, By Formation in Field

(3) Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production

Output Method	The Unit Output Data Item	Method of Statistics
E13	Monthly Production of Field	By Area
E14	Monthly Production of Block Station	By Area, By Facilities Field
E15	Monthly Production of Well	By Area, By Field
E16	Monthly Production of Well	By Area, By Facilities Field By Block Station
E17	Monthly Production of Formation in Field	By Area
E18	Monthly Production of Reservoir Unit	By Area, By Field, By Formation in Field

(4) Monthly Solution Gas, Gas Cap Gas and Non Associated Gas Production

Output Method	The Unit Output Data Item	Method of Statistics
E19	Monthly Production of Field	By Area
E20	Monthly Production of Block Station	By Area, By Facilities Field
E21	Monthly Production of Formation in Field	By Area
E22	Monthly Production of Reservoir Unit	By Area, By Field, By Formation in Field

(5) Historical Monthly Oil & Total Condensate and Total Gas Production

Output Method	The Unit Output Data Item	Method of Statistics
E23	Monthly Production of Area	
E24	Monthly Production of Field	
E25	Monthly Production of Block Station	
E26	Monthly Production of Well	
E27	Monthly Production of Formation in Area or Field	
E28	Monthly Production of Reservoir Unit	

(6) Historical Monthly Oil, Gas Cap Condensate and Nonassociated Condensate Production

Output Method	The Unit Output Data Item	Method of Statistics
E29	Monthly Production of Area	
E30	Monthly Production of Field	
E31	Monthly Production of Block Station	
E32	Monthly Production of Formation in Area or Field	
E33	Monthly Production of Reservoir Unit	

(7) Historical Monthly High Pressure Gas, Medium Pressure Gas and Low Pressure Gas Production

Output Method	The Unit Output Data Item	Method of Statistics
E34	Monthly Production of Area	
E35	Monthly Production of Field	
E36	Monthly Production of Block Station	
E37	Monthly Production of Well	
E38	Monthly Production of Formation in Area or Field	
E39	Monthly Production of Reservoir Unit	

(8) Historical Monthly Solution Gas, Gas Cap Gas and Nonassociated Gas Production

Output Method	The Unit Output Data Item	Method of Statistics
E40	Monthly Production of Area	
E41	Monthly Production of Field	
E42	Monthly Production of Block Station	
E43	Monthly Production of Formation in Area or Field	
E44	Monthly Production of Reservoir Unit	

(9) Monthly Water Injection

Output Method	The Unit Output Data Item	Method of Statistics
E45	Monthly Injection of Field	By Area
E46	Monthly Injection of Well	By Area, By Field
E47	Monthly Injection of Formation by Field	By Area
E48	Monthly Injection of Reservoir Unit	By Area, By Field, By Formation in Field
E49	Monthly Injection of Reservoir Unit	By Area, By Well
E50	Monthly Injection of Well	By Area, By Field, By Formation in Field, By Reservoir Unit

(10) Monthly Gas Injection

Output Method	The Unit Output Data Item	Method of Statistics
E51	Monthly Injection of Field	By Area
E52	Monthly Injection of Well	By Area, By Field
E53	Monthly Injection of Formation by Field	By Area,
E54	Monthly Injection of Reservoir Unit	By Area, By Field, By Formation in Field
E55	Monthly Injection of Reservoir Unit	By Area, By Field, By Well
E56	Monthly Injection of Well	By Area, By Field, By Formation in Field, By Reservoir Unit

(11) Historical Monthly Water Injection

Output Method	The Unit Output Data Item	Method of Statistics
E57	Monthly Injection of Area	
E58	Monthly Injection of Field	
E59	Monthly Injection of Well	
E60	Monthly Injection of Formation in Area or Field	
E61	Monthly Injection of Reservoir Unit	

(12) Historical Monthly Gas Injection

Output Method	The Unit Output Data Item	Method of Statistics
E62	Monthly Injection of Area	
E63	Monthly Injection of Field	
E64	Monthly Injection of Well	
E65	Monthly Injection of Formation in Area or Field	
E66	Monthly Injection of Reservoir Unit	

(13) Monthly Gas Production and Consumption

Output Method	The Unit Output Data Item	Method of Statistics
E67	Monthly Production and Consumption of Area	
E68	Monthly Production and Consumption of Field	By Area

(14) Historical Monthly Gas Production and Consumption

Output Method	The Unit Output Item	Method of Statistics
E69	Monthly Production and Consumption of Unit II	
E70	Monthly Production and Consumption of Area	
E71	Monthly Production and Consumption of Field	

(15) Monthly Oil Consumption

Output Method	The Unit Output Item	Method of Statistics
E72	Monthly Oil Consumption of Area	

(16) Historical Monthly Oil Consumption

Output Method	The Unit Output Item	Method of Statistics
E73	Monthly Oil Consumption of Unit II	
E74	Monthly Oil Consumption of Area	

(17) Well Status Report for All Wells

Output Method	The Unit Output Data Item	Method of Statistics
E75	Number of Wells in Field	By Area
E76	Number of Wells in Reservoir Unit	By Area, By Field, By Formation in Field

(18) Well Status Report for Producer

Output Method	The Unit Output Data Item	Method of Statistics
E77	Number of Producers in Field	By Area
E78	Number of Producers in Reservoir Unit	By Area, By Field, By Formation in Field

(19) Well Status Report for Injector

Output Method	The Unit Output Data Item	Method of Statistics
E79	Number of Injectors in Field	By Area
E80	Number of Injectors in Reservoir Unit	By Area, By Field, by Formation in Field

(20) Well Status Report for Shut-in Well

Output Method	The Unit Output Data Item	Method of Statistics
E81	Number of Shut-in Wells in Field	By Area
E82	Number of Shut-in Wells in Reservoir Unit	By Area, By Field, By Formation in Field

(21) Well Status Report for Waiting Well

Output Method	The Unit Output Data Item	Method of Statistics
E83	Number of Waiting Wells in Field	By Area
E84	Number of Waiting Wells in Reservoir Unit	By Area, By Field, By Formation in Field

3-6 F-Reserves Data Information

Fifteen of statistical output reporting methods are conceived relating to this data information group, which are referred to the page AI-123 of APPENDIX I.

For the convenience of utilization, these are classified into following four groups.

- (1) Remaining Reserves
- (2) Original Hydrocarbon In Place and Reserves
- (3) Historical Remaining Reserves Summary
- (4) Reservoir Parameter

Assignment parameters for these output reporting methods are as follows.

- Area name
- Field name
- Formation name
- Reservoir unit name
- Development status of reservoir unit
- Kind of reserves
- Kind of recovery method
- Abandon condition for gas cap zone and gas reservoir
- Kind of reservoir
- Period

Remarks are made relating to the above as follows.

- 1) Kind of reserves are classified into the following nine categories.
 - i) Oil
 - ii) Gas cap condensate
 - iii) Non Associated condensate
 - iv) Total condensate = ii) + iii)
 - v) Oil & total condensate = i) + ii) + iii)
 - vi) Solution gas
 - vii) Gas cap gas
 - viii) Non Associated gas
 - ix) Total gas = vi) + vii) + viii)

2) Primary recovery, secondary recovery and tertiary recovery are conceived as a kind of recovery method, and assignment methods are as follows.

- Primary recovery
- Secondary recovery
- Tertiary recovery
- Sum of primary and secondary recoveries
- Sum of primary, secondary and tertiary recoveries
- Sum of secondary and tertiary recoveries

3) Reserves data corresponding to the period assigned is to be retrieved together with the related data.

A description is made relating to the purpose and function of the methods by groups aforementioned as follows.

(1) Remaining Reserves

F1 Remaining reserves by field by kind of reserves

F2 Remaining reserves for formation by field by kind of reserves

F3 Remaining reserves by reservoir unit by kind of reserves

F4 Remaining reserves by reservoir unit

These are designed for the purpose of grasping statistically the oil, condensate and gas remaining reserves.

Followings are data items for the respective methods of F1-F4 respectively.

Item name	F1	F2	F3	F4
- Remaining reserves at the beginning of the last year	o	o	o	x
- Proved				
- Probable				
- Possible				

Item name	F1	F2	F3	F4
- Production during the last year	o	o	o	x
- Injection during the last year	o	o	o	x
- Extension or reduction by revision during the last year	o	o	o	x
- Proved				
- Probable				
- Possible				
- Remaining reserves at the beginning of the year				
- Proved	o	o	o	o
- Probable	o	o	o	x
- Possible	o	o	o	x
- Discounted	o	o	o	o
- Method of discounted value calculation		o	o	o

Table in the page 152 shows the unit output data items and the methods of statistics for the respective methods of F1-F4.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of F1-F4.

Output reporting method	Assignment parameter	Assignment parameter for common use
F1	Kind of reserves	Area name Development status of reservoir unit Kind of recovery method Abandon condition for gas cap zone and gas reservoir Period
F2	Formation name, Kind of reserves	
F3	Field name, Kind of reserves	
F4	Field name	

As for F1-F3, data information related to the kind of reserves assigned is to be retrieved, calculated and output according to the other assignment parameters.

As for F2, in case that Jambi is assigned by the assignment parameter of "Area name", remaining reserves related to the assigned formation is to be calculated and output by fields in Jambi area according to the other assignment parameters.

As for F4, 1) in case of oil reservoir, data information related to oil, solution gas, gas cap condensate and gas cap gas, 2) in case of gas reservoir, data information related to Non Associated condensate and Non Associated gas are output by reservoir units according to the other assignment parameters.

(2) Original Hydrocarbon In Place and Reserves

F5 Original hydrocarbon in place and reserves by field by kind of reserves

F6 Original hydrocarbon in place and reserves for formation by field by kind of reserves

F7 Original hydrocarbon in place and reserves by reservoir unit by kind of reserves

F8 Original hydrocarbon in place and reserves by reservoir unit

These are designed for the purpose of grasping statistically the hydrocarbon in place and the original reserves.

Followings are data items for the respective methods of F5-F8 respectively.

Item name	F5	F6	F7	F8
- Original hydrocarbon in place	o	o	o	o
- Proved				
- Probable				
- Possible				

Item name	F5	F6	F7	F8
- Recovery factor	o	o	o	o
- Proved				
- Probable				
- Possible				
- Original reserves	o	o	o	o
- Proved				
- Probable				
- Possible				
- Discounted				
- Method of discounted value calculation	o	o	o	o

Table in the page 152 shows the unit output data items and the methods of statistics for the respective methods of F5-F8.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of F5-F8.

Output reporting method	Assignment parameter	Assignment parameter for common use
F5	Kind of reserves	Area name Development status of reservoir unit Kind of recovery method Abandon condition for gas cap zone and gas reservoir Period
F6	Formation name, kind of reserves	
F7	Field name, kind of reserves	
F8	Field name	

As for F5-F7, data information related to the kind of reserves assigned is to be retrieved, calculated and output according to the other assignment parameters.

As for F6, in case that Jambi is assigned by the assignment parameter of "Area name", remaining reserves related to the assigned formation is to be calculated and output by fields in Jambi area according to the other assignment parameters.

As for F8, 1) in case oil reservoir, data information related to oil, solution gas, gas cap condensate and gas cap gas, 2) in case of gas reservoir, data information related to Non Associated condensate and Non Associated gas are output by reservoir units according to the other assignment parameters.

(3) Historical Remaining Reserves Summary

F9 Historical remaining reserves summary for area by kind of reserves

F10 Historical remaining reserves summary for field by kind of reserves

F11 Historical remaining reserves summary for formation by kind of reserves

F12 Historical remaining reserves summary for reservoir unit by kind of reserves

F13 Historical remaining reserves summary for reservoir unit

These are designed for the purpose of grasping the remaining reserves of oil, condensate and gas historically.

Followings are data items for the respective methods of F9-F13 respectively.

Item name:	F9	F10	F11	F12	F13
- Remaining reserves at the beginning of the year	o	o	o	o	o
- Proved	o	o	o	o	x
- Probable	o	o	o	o	x
- Possible	o	o	o	o	o
- Discounted	o	o	o	o	o

Item name	F9	F10	F11	F12	F13
- Production during the year	o	o	o	o	x
- Injection during the year	o	o	o	o	x
- Extension or reduction by revision during the year	o	o	o	o	x
- Proved					
- Probable					
- Possible					
- Remaining reserves at the end of the year	o	o	o	o	x
- Proved					
- Probable					
- Possible					
- Discounted					
- Method of discounted value calculation	o	o	o	o	o

Table in the page 153 shows the unit output data items and the methods of statistics for the respective methods of F9-F13.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above methods of statistics and the following assignment parameters for the respective output reporting methods of F9-F13.

Output reporting method	Assignment parameter	Assignment parameter for common use
F9	Area name, development status of reservoir unit, kind of reserves	Kind of recovery method Abandon condition for gas cap zone and gas reservoir
F10	Field, development status of reservoir unit, kind of reserves	Period
F11	Formation name, area name, development status of reservoir unit, kind of reserves	

Output reporting method	Assignment parameter	Assignment parameter for common use
F12	Reservoir unit name, kind of reserves	
F13	Reservoir unit name	

As for F9-F12, data information related to the kind of reserves assigned is to be retrieved, calculated and output according to the other assignment parameters.

As for F11, in case that Jambi is assigned by the assignment parameter of "Area name", the remaining reserves history of the assigned formation in Jambi area is retrieved and output, while in case that a specific field name is assigned by the assignment parameter of "Field name", the remaining reserves history of the assigned formation in the field is retrieved and output.

As for F13, 1) in case of oil reservoir, data information related to oil, solution gas, gas cap condensate and gas cap gas, 2) in case of gas reservoir, data information related to Non Associated condensate and Non Associated gas are output by reservoir units according to the other assignment parameters.

(4) Reservoir Parameter

F14 Reservoir Parameter for oil zone

F15 Reservoir Parameter for gas cap zone and gas reservoir

These are designed for the purpose of grasping statistically the reservoir parameter.

Followings are data items for the respective methods of F14 and F15.

Item name	F14	F15
- Areal extend	o	o
- Proved		
- Probable		
- Possible		

	F14	F15
- Net bulk rock volume	o	o
- Proved		
- Probable		
- Possible		
- Weighted average porosity	o	o
- Proved		
- Probable		
- Possible		
- Weighted average water saturation	o	o
- Proved		
- Probable		
- Possible		
- Weighted average formation volume factor	o	x
- Proved		
- Probable		
- Possible		
- Original oil in place	o	x
- Proved		
- Probable		
- Possible		
- Original solution gas in place	o	x
- Proved		
- Probable		
- Possible		
- Weighted average gas oil ratio	o	o
- Proved		
- Probable		
- Possible		
- Expansion factor	x	o
- Initial		
- 60 or 20 KSC		
- 30 or 10 KSC		
- Total original gas in place	x	o
- Proved		
- Probable		
- Possible		

	F14	F15
- Fractional gas		
- Initial gas in place	x	o
- Proved		
- Probable		
- Possible		
- Original condensate in place	x	o
- Proved		
- Probable		
- Possible		
- Fluid property	o	x
- Bubble point pressure		
- Oil gravity		
- Gas gravity		
- Oil viscosity		
- Gas viscosity		
- Reference report	o	o
- Title		
- Date		
- Reference number		
- Author		
- Organization of author		
- Map date		

Table in the page 153 shows the unit output data items and the methods of statistics for F14 and F15.

The unit data for data items as mentioned in the previous part is to be retrieved and output according to the above method of statistics and the following assignment parameters for the output reporting methods of F14 and F15.

- Area name
- Field name
- Reservoir unit
- Kind of reservoir

OUTPUT METHOD

(1) Remaining Reserves

Output Method	The Unit Output Data Item	Method of Statistics
F1	Remaining Reserves of Field by Kind Reserves	By Area
F2	Remaining Reserves of Formation by Field by Kind of Reserves	By Area
F3	Remaining Reserves of Reservoir Unit by Kind of Reserves	By Area, By Field, By Formation in Field,
F4	Remaining Reserves of Reservoir Unit	By Area, By Field, By Formation in Field,

(2) Original Hydrocarbon In Place and Reserves

Output Method	The Unit Output Data Item	Method of Statistics
F5	Original Hydrocarbon In Place and Reserves of Field by Kind of Reserves	By Area
F6	Original Hydrocarbon In Place and Reserves of Formation by Field by Kind of Reserves	By Area
F7	Original Hydrocarbon In Place and Reserves of Reservoir Unit by Kind of Reserves	By Area, By Field, By Formation in Field,
F8	Original Hydrocarbon In Place and Reserves of Reservoir Unit	By Area, By Field, By Formation in Field,

(3) Historical Remaining Reserves Summary

Output Method	The Unit Output Data Item	Method of Statistics
F9	Remaining Reserves of Area by Kind of Reserves	
F10	Remaining Reserves of Field of Kind of Reserves	
F11	Remaining Reserves of Formation in Area or Field by Kind of Reserves	
F12	Remaining Reserves of Reservoir Unit by Kind of Reserves	
F13	Remaining Reserves of Reservoir Unit	

(4) Reservoir Parameter

Output Method	The Unit Output Data Item	Method of Statistics
F14	Reservoir Parameter of Reservoir Unit	By Area, By Field, By Formation in Field,
F15	Reservoir Parameter of Reservoir Unit	By Area, By Field, By Formation in Field

3-7 G-Production Operation Data Information

Eleven of basic output reporting methods are ten of combined output reporting methods are conceived relating to this data information group.

Assignment parameters for these output reporting methods are as follows.

- Area name
- Field or prospect name
- Station name
- Well name
- Workover number
- Reservoir unit name
- Layer name
- Kind of production test
- Type of production test
- Kind of injection test
- Type of injection test
- Kind of injection fluid
- Type of subsurface pressure survey
- Kind of production log
- Objective for stimulation
- Type of stimulation
- Kind of analysis
- Period

A description is made relating to the purpose and function of the methods as follows.

3-7-1 Basic Output Reporting Method

There are eleven of basic output reporting methods G0-1, G0-11, G0-12, G0-13, G0-14, G0-15, G0-2, G0-21, G0-22, G0-23 and G0-24 which are referred to the page AI-134 of APPENDIX I.

Followings are G0-1 and its subordinate output reporting methods.

<u>G0-1</u>	<u>Well Test and Stimulation Information</u>
<u>G0-11</u>	<u>Production Test Information</u>
<u>G0-12</u>	<u>Injection Test Information</u>
<u>G0-13</u>	<u>Subsurface Pressure Survey Information</u>
<u>G0-14</u>	<u>Production Log Information</u>
<u>G0-15</u>	<u>Well Stimulation Information</u>

G0-1 is related to data information of well test and stimulation. All the above data information can be retrieved and output at the same time in use of G0-1, while the above data information can be retrieved and output independently in a separate form in use of G0-11, G0-12, G0-13, G0-14 and G0-15 respectively.

Assignment parameters to be applied to the respective methods are as follows.

Output reporting method	Assignment parameter	Assignment parameter for common use
G0-1	Kind of production test, Type of production test, Kind of injection test, Type of injection test, Kind of injection fluid, Type of subsurface pressure survey, Kind of production log, Objective for stimulation, Type of stimulation	Area name Field or prospect name, Well name, Workover number, Reservoir unit name, Layer name, Period
G0-11	Kind of production test, Type of production test, Formation name	
G0-12	Kind of injection test, Type of injection test, Type of injection fluid	
G0-13	Type of subsurface pressure survey	
G0-14	Kind or production log	
G0-15	Objective stimulation, Type of stimulation	

Test period is to be retrieved according to the assignment of "Period" in case of G0-11, G0-12, G0-13 and G0-14, while stimulation period in case of G0-15.

Followings are G0-2 and its subordinate output reporting methods.

<u>G0-2</u>	<u>Field Laboratory Fluid Analysis Information</u>
<u>G0-21</u>	<u>Oil Analysis</u>
<u>G0-22</u>	<u>Condensate Analysis</u>
<u>G0-23</u>	<u>Gas Analysis</u>
<u>G0-24</u>	<u>Water Analysis</u>

G0-2 is related to data information of field laboratory fluid analysis information. All the above data information can be retrieved and output at the same time in use of G0-2, while the above data information can be retrieved and output independently in a separate form in use of G0-21, G0-22, G0-23 and G0-24 respectively.

Assignment parameters to be applied to the respective methods are "Area name", "Field or prospect name", "Station name", "Well name", "Workover number", "Reservoir unit name". Sampling date is to be retrieved according to the assignment of "Period" in these methods.

3-7-2 Combined Output Method

There are ten of combined output reporting methods G1 - G10, which are referred to the page AI - 134 of APPENDIX I.

G1 Production Test Result

G1 is designed for the purpose of correlating data information related to production test by wells. The following data items are selected to retrieve and output according to the instruction given by the assignment parameters as mentioned in the latter part.

- Well name
- Workover number
- String name
- Kind of completed zone
- Well status
- Reservoir unit name
- Kind of production test
- Type of production test
- Test period
- Production record
 - Flowing method for test
 - Choke size
 - Oil rate
 - Gas rate
 - Water cut
- Test result
 - p^*
 - Flow capacity
 - Permeability
 - Skin factor
 - Damage ratio
 - Productivity index
 - Ideal
 - Actual
 - Flow efficiency
 - $Q_{o\max}$
 - Absolute open flow potential

Assignment parameters to be applied to this method are "Area name", "Field or prospect name", "Well name", "Workover number", "Reservoir unit name", "Layer name", "Kind of production test", "Type of production test" and "Period". Test period is to be retrieved according to the assignment of "Period" in this method.

G2 Injection Test Result

G2 is designed for the purpose of correlating data information related to injection test by wells. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Well name
- Workover number
- String name
- Kind of completed zone
- Well status
- Reservoir unit name
- Kind of injection test
- Type of injection test
- Kind of injection fluid
- Test period
- Injection record
 - Wellhead injecting pressure
 - Injection rate
- Test result
 - p^*
 - Flow capacity
 - Permeability
 - Skin factor
 - Damage ratio
 - Injectivity index
 - Ideal
 - Actual
 - Flow efficiency

Assignment parameters to be applied to this method are "Area name", "Field or prospect name", "Well name", "Workover number", "Reservoir unit name", "Layer name", "Kind of injection test", "Type of injection test", "Kind of injection fluid" and "Period". Test period is to be retrieved according to the assignment of "Period" in this method.

G3 Bottomhole Pressure Survey Record Diagram

G3 is designed for the purpose of correlating the kind and the number of bottomhole pressure surveys carried out in the wells by the reservoir units in the assigned field or prospect. The following data items are retrieved and output according to the assignment parameters as mentioned in the latter part.

- Well name
- Reservoir unit name
- Type of subsurface pressure survey
- Number of subsurface pressure surveys conducted

Assignment parameters to be applied to this method are as follows.

- Field or prospect name
- Well name
- Workover number
- Reservoir unit name
- Period

Test period is to be retrieved according to the assignment of "Period" in this method. Ten of reservoir units and its output order can be assigned at most by one time execution. In case of correlation of reservoir units more than ten each, therefore, executions more than two times are required for production of output. As for number of well names, it is unlimited and the output order for well name can be assigned.

G4 Current Bottomhole Pressure Survey Record

G4 is designed for the purpose of correlating the most up-to-date information related to bottomhole pressure record by wells. The following data items are selected to retrieve and output according to the instruction given by the assignment parameters as mentioned in the latter part.

- Well name
- Workover number
- Reservoir unit name
- Layer name
- Period
- Type of subsurface pressure survey
- Survey depth
 - BDF
 - Subsea depth
- Datum plane depth in subsea depth
- Date of last calibration
- Pressure element number
- Type of pressure element
- Bottomhole pressure (final point)
- Liquid level in subsea depth
- Average pressure gradient for gas column
- Average pressure gradient for liquid column
- Wellhead pressure

Assignment parameters to be applied to this method are "Area name", "Field or Prospect Name", "Well name", "Reservoir Unit Name", "Layer Name" and "Type of Subsurface Pressure Survey".

G5 Current Buildup and Falloff Pressure Survey Result

G5 is designed for the purpose of correlating the results of buildup and falloff pressure surveys carried out in the most up-to-date by wells. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Well name
- Workover number
- Reservoir unit name
- Layer name
- Period
- Type of subsurface pressure survey
- Survey depth
 - BDF
 - Subsea depth

- Bottomhole pressure (final point)
- Test analysis result
 - p^*
 - Flow capacity
 - Permeability
 - Skin factor
 - Damage ratio
 - Productivity index
 - Ideal
 - Actual
 - Flow efficiency
 - $Q_{o\max}$
 - Absolute open flow potential

Assignment parameters to be applied to this method are "Area name", "Field or prospect name", "Well name", "Reservoir unit name", "Layer name" and "Type of subsurface pressure survey".

G6 List of Production Log Survey

G6 is designed for the purpose of correlating data information related to production log survey by wells. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Well name
- Workover number
- Reservoir unit name
- Layer name
- Survey period
- Kind of production log
- Run number
- Interval
- Log identification number

Assignment parameters to be applied to this method are "Area name", "Field or prospect name", "Well name", "Workover number", "Reservoir unit name", "Layer name", "Kind of production log" and "Period".

Test period is to be retrieved according to the assignment of "Period" in this method.

G7 Stimulation Job Result

G7 is designed for the purpose of correlating data information related to stimulation by wells. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Well name
- Workover number
- Period
- Objective for stimulation
- Type of stimulation
- Total days
- Summary of treatment
- Reservoir unit name
- Interval
- Production test information before stimulation
 - Date of production test
 - Flowing method for test
 - Choke size
 - Oil rate
 - Gas rate
 - Water cut
 - Productivity index (actual)
 - Skin factor
- Production test information after stimulation
 - Date of production test
 - Flowing method for test
 - Choke size
 - Oil rate
 - Gas rate
 - Water cut
 - Productivity index (actual)
 - Skin factor

Assignment parameters to be applied to this method are "Area name", "Field or prospect name", "Well name", "Workover number", "Reservoir unit name", "Layer name", "Objective for Stimulation", "Type of stimulation" and "Period". Stimulation period is to be retrieved according to the assignment of "Period" in this method.

G8 Field Laboratory Fluid Analysis Data Summary

G8 is designed for the purpose of correlating data information related to field laboratory fluid analysis data (oil, condensate, gas and water) by wells. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Well name
- Sampling date
- Reservoir unit name
- Layer name
- Kind of analysis
- Sampling place
- Oil or condensate information
 - API gravity
 - API pour point
- Gas information
 - Component with highest per cent volume
 - Per cent volume of CO₂
 - Gross heating value
 - Net calorific value
- Water information
 - Salinity
 - Scaling index
 - Total solid

Assignment parameters to be applied to this method are "Area name", "Field or prospect name", "Well name", "Workover number", "Reservoir unit name", "Layer name", "Kind of analysis" and "Period". Sampling date is to be retrieved according to the assignment of "Period" in this method.

G9 Field Laboratory Gas Analysis Data Summary

G9 is designed for the purpose of correlating the gas components obtained by field laboratory gas analysis by wells. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Well name
- Sampling date
- Reservoir unit name
- Layer name
- Sampling place
- Component
 - H₂S
 - CO₂
 - O₂
 - N₂
 - C₁
 - C₂
 - C₃
 - iC₄
 - nC₄
 - iC₅
 - nC₅
 - C₆₊

Assignment parameters to be applied to this method are "Area name", "Field or prospect name", "Well name", "Workover number", "Reservoir unit name", "Layer name" and "Period". Sampling date is to be retrieved according to the assignment of "Period" in this method.

G10 Field Laboratory Water Analysis Data Summary

G10 is designed for the purpose of correlating the water components obtained by field laboratory water analysis by wells.

The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Well name
- Sampling date
- Reservoir unit name
- Layer name
- Sampling place
- Component
 - Na⁺
 - K⁺
 - Ca⁺⁺
 - Mg⁺⁺
 - Ba⁺⁺
 - Fe⁺⁺⁺
 - Cl⁻
 - HCO₃⁻
 - SO₄⁼
 - CO₃⁼

Assignment parameter to be applied to the method are "Area name", "Field or prospect name", "Well name", "Workover number", "Reservoir unit name", "Layer name" and "Period". Sampling date is to be retrieved according to the assignment of "Period" in this method.

3-8 H-Production Facilities Data Information

Six of basic output reporting methods and eleven of combined output reporting methods are conceived relating to this data information group.

Assignment parameters for these output reporting methods are as follows.

- Field office name
- Facilities field name
- Kind of station
- Station name
- Kind of equipment
- Equipment name
- Specification
- Manufacturer name
- Result of inspection
- System code (Refer to the page AII-176 of APPENDIX II)
- Period

Remarks of the above assignment parameters are described as follows.

- 1) Facilities field name is different from the above-mentioned field name (Refer to Appendix III) and is the name of division area for production management. In general, one division area for production management consists of a few or several fields.
- 2) Assignment parameters related to "Specification" classified by kinds of equipment, are described as "Specification items for assignment" in the next page Table 3-1. In case of vessel tank, for example, a certain range is to be assigned as to assignment parameters of "Volume" and "Pressure" (e.g. over 5m^3 , $10\text{-}50\text{ kg/cm}^2\text{G}$). As a result, vessel tank with the data of which the value falls in the range is to be retrieved together with the related data.

Table 3-1 SPECIFICATION ITEMS FOR ASSIGNMENT

KIND OF EQUIPMENT		MAIN SPECIFICATION (DESIGN)		
CODE	NAME	(1)	(2)	(3)
01	Separator	Flow Rate (Liq.) KL/d 9 (4) v9 (1)	Flow Rate (Gas) std m ³ /d 9 (8)	Pressure kg/cm ² 9 (3) v9 (1)
02	Vessel Tank	Volume m ³ 9 (6)	Pressure kg/cm ² 9 (3) v9 (1)	-
03	Absorber	Flow Rate *1 kg/h 9 (8)	Flow Rate (Solution) l/min 9 (5)	Pressure kg/cm ² 9 (3) v9 (1)
04	Stripper	Flow Rate *1 kg/h 9 (5)	Flow Rate (Solution) l/min 9 (5)	Pressure kg/cm ² 9 (3) v9 (1)
05	Filter	Flow Rate (Liq.) KL/d 9 (6)	Flow Rate (Gas) std m ³ /d 9 (8)	Pressure kg/cm ² 9 (3) v9 (1)
06	Absorber	Flow Rate *1 kg/h 9 (5)	Pressure kg/cm ² 9 (3) v9 (1)	-
21	Storage Tank	Volume m ³ 9 (6)	Pressure cm H ₂ O G 9 (3) v9 (1)	*1 Flow rate of fluid treated

KIND OF EQUIPMENT		MAIN SPECIFICATION (DESIGN)			
CODE	NAME	(1)	(2)	(3)	
31	Heat Exchanger	Thermal Duty kcal/h 9(8)	Surface Area ^{*1} m ² 9(4)		* Heating Surface Area
32	Fired Heater	Thermal Duty kcal/h 9(8)	Surface Area ^{*1} m ² 9(4)		
33	Refrigerator	Thermal Duty kcal/h 9(8)	Flow Rate (Brine) kl/h 9(3)v9(1)		
41	Pump	Flow Rate kl/h 9(5)v9(3)	Head ^{*2} kg/cm ² 9(3)v9(1)		*2 Total Difference Head
42	Compressor	Flow Rate std m ³ /h 9(7)	Head ^{*2} kg/cm ² 9(3)v9(1)		
43	Generator	Output Capacity kVA 9(5)	Voltage Volt 9(4)		
44	Fan or Blower	Flow Rate std m ³ /h 9(7)	Head ^{*2} cm H ₂ O 9(4)v9(1)		
45	Agitator	Power kW 9(3)	Volume ^{*3} kl/each 9(5)		*3 Volume of vessel per each agitator

KIND OF EQUIPMENT		MAIN SPECIFICATION (DESIGN)		
CODE	NAME	(1)	(2)	(3)
51	Electric Motor	Power *1 kW 9 (5)	Speed *2 rpm 9 (5)	*1 Power corresponding to voltage used actually *2 Speed without reduction
52	Ignition Engine	Power kW 9 (4) v9 (1)	Speed *2 rpm 9 (5)	
53	Steam Engine	Power kW 9 (4) v9 (1)	Speed *2 rpm 9 (5)	
54	Gas Turbine	Power kW 9 (5)	Speed *2 rpm 9 (5)	
91	Fire Fighting System	Flow Rate *3 (Liquid) l/min 9 (5)	Flow Rate *3 (Other) kg/min 9 (5)	*3 Design flow rate per one whole system *4 Duration of discharge corresponding to design flow rate

A description is made relating to the purpose and function of the methods as follows.

3-8-1 Basic Output Reporting Method

There are six of basic output reporting methods H0-1, H0-11, H0-12, H0-2, H0-21, and H0-22, which are referred to the page AI-161 of APPENDIX I. Followings are H0-1 and its subordinate output reporting methods.

<u>H0-1</u>	<u>Station General</u>
<u>H0-11</u>	<u>Station Resume</u>
<u>H0-12</u>	<u>Station Modification</u>

H0-1 is related to data information of station general. All the above data information can be retrieved and output at the same time in use of H0-1, while the above data information can be retrieved and output independently in a separate form in use of H0-11 and H0-12, respectively.

Assignment parameters to be applied to the respective method are "Field office name", "Facilities field name", "Kind of station", "Station name", and "Period".

Date of installation is to be retrieved according to the assignment of "Period" in case of H0-11, while end date of modification in case of H0-12. And both date are to be retrieved simultaneously and independently in case of H0-1.

<u>H0-2</u>	<u>Equipment General</u>
<u>H0-21</u>	<u>Equipment Resume</u>
<u>H0-22</u>	<u>Equipment Maintenance</u>

H0-2 is related to data information of equipment general. All the above data information can be retrieved and output at the same time in use of H0-2, while the above data information can be retrieved and output independently in a separate form in use of H0-21 and H0-22, respectively.

Assignment parameters to be applied to the respective methods are "Field office name", "Facilities field name", "Kind of

station", "Station name", "Kind of equipment", "Equipment name", "Specification", "Result of inspection", and "Period".

Date of installation is to be retrieved according to the assignment of "Period" in case of H0-21, while end date of work in case of H0-22, and both dates are to be retrieved simultaneously and independently in case of H0-2.

3-8-2 Combined Output Method

There are eleven of combined output reporting methods H1 - H11, which are referred to the page AI-161 of APPENDIX I.

H1 Summary of Station (by Facilities Field)

H1 is designed for the purpose of correlating data information related to station by facilities fields. And this is the summarized report of the above-mentioned basic output reporting method about stations. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Station name
- Function and capacity
- Drawing no. of flow diagram
- Drawing no. of plot plan
- Drawing no. of piping
- Order document no.
- Station cost
- Date of station delivery

Assignment parameters to be applied to this method are "Field office name", "Facilities field name", "kind of station", "Station name", and "Period". Date of station delivery is to be retrieved according to the assignment of "Period" in this method.

H2 Station Cost Data by Kind of Station

H2 is designed for the purpose of correlating data information

related to station cost by kinds of station. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Station name
- Station cost (Material cost)
- Station cost (Site work cost)
- Station cost (Indirect cost)
- Station cost (Total cost)
- Date of station delivery
- Invoice no.

Assignment parameters to be applied to this method are "Field office name", "Facilities field name", "Kind of station", "Station name", and "Period". Date of station delivery is to be retrieved according to the assignment of "Period" in this method.

H3 Station Cost Data by Year (of Station Delivery)

H3 is designed for the purpose of correlating data information related to station construction cost by years of station delivery. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Station name
- Station cost
- Date of station delivery

Assignment parameters to be applied to this method are "Field office name", "Facilities field name", "Kind of station", and "Period". Date of station delivery is to be retrieved according to the assignment of "Period" in this method.

H4 Summary of Equipment (by Station)

H4 is designed for the purpose of correlating data information

related to equipment by stations. And this is the summarized report of the above-mentioned basic output reporting method about equipment. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Equipment name
- Equipment popular name (Ex. water injection pump)
- Equipment object no.
- Type
- Main specification (Refer to Table 3-1)
- Manufacturer name
- Drawing no.
- Order document no.
- Date of installation
- Equipment cost

Assignment parameters to be applied to this method are "Field office name", "Facilities field name", "Kind of station", "Station name", "Kind of equipment", "Equipment name", "Main specification", and "Period". Date of equipment installation is to be retrieved according to the assignment of "Period" in this method.

H5 Equipment Cost Data by Kind of Equipment

H5 is designed for the purpose of correlating data information related to equipment cost by kinds of equipment. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Equipment name
- Equipment popular name
- Station name
- Equipment object no.
- Type
- Main specification (Refer to Table 3-1)
- Equipment cost
- Date of installation

Assignment parameters to be applied to this method are "Field office name", "Facilities field name", "Kind of station", "Station name", "Kind of equipment", "Main specification", and "Period". Date of equipment installation is to be retrieved according to the assignment of "Period" in this method.

H6 Equipment Data by Manufacturer

H6 is designed for the purpose of correlating data information related to equipment by manufacturers. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Equipment name
- Equipment popular name
- Station name
- Equipment object no.
- Type
- Equipment cost
- Date of installation

Assignment parameters to be applied to this method are "Field office name", "Facilities field name", "Kind of station", "Station name", "Kind of equipment", "Manufacturer name", "Manufacturer's country name" and "Period". Date of equipment installation is to be retrieved according to the assignment of "Period" in this method.

H7 Equipment Cost Data by Year (of installation)

H7 is designed for the purpose of correlating data information related to equipment cost by years. The following data items are selected as mentioned in the latter part.

- Equipment name
- Equipment popular name
- Station name
- Equipment object no.
- Type

- Equipment cost

- Date of installation

Assignment parameters to be applied to this method are "Field office name", "Facilities field name", "Kind of station", "Station name", "Kind of equipment" and "Period". Date of equipment installation is to be retrieved according to the assignment of "Period" in this method.

H8 Summary of Station Modification (by Modification)

H8 is designed for the purpose of correlating data information related to station modification. And this is the summarized report of the above-mentioned basic output reporting method about station modification. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Station name
- Date of station delivery
- Station cost (Initial investment)
- End date of modification
- Period of modification
- Modification cost
- Invoice no.
- Order document no.
- Report no.
- Kind and name of executor

Assignment parameters to be applied to this method are "Field office name", "Facilities field name", "Kind of station", "Station name", and "Period". End date of modification is to be retrieved according to the assignment of "Period" in this method.

H9 Summary of Equipment Maintenance (by Maintenance)

H9 is designed for the purpose of correlating data

information related to equipment maintenance. And this is the summarized report of the above-mentioned basic output reporting method about equipment maintenance. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Equipment name
- Equipment popular name
- Equipment object no.
- Type
- End date of work
- Period of work
- Kind and name of executor
- Kind of repair
- Kind of inspection
- Result of inspection
- Maintenance cost
- Report no.

Assignment parameters to be applied to this method are "Field office name", "Facilities field name", "Kind of station", "Station name", "Kind of equipment", "Equipment name", "Result of inspection", and "Period". End date of work is to be retrieved according to the assignment of "Period" in this method.

H10 Equipment Maintenance Cost Data (by Year)

H10 is designed for the purpose of correlating data information related to equipment maintenance cost by years. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Equipment name
- Equipment popular name
- Equipment object no.
- Type
- Maintenance cost by year

- Equipment cost
- Date of installation
- Year

Assignment parameters to be applied to this method are "Field office name", "Facilities field name", "Kind of station", "Station name", "Kind of equipment", "Equipment name", and "Period". End date of work is to be retrieved according to the assignment of "Period" in this method.

Hll System's Equipment Data

Hll is designed for the purpose of correlating data information related to equipment by systems. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Equipment name
- Equipment popular name
- Equipment object no.
- Type
- Name of manufacturer
- Date of installation
- Equipment cost
- Invoice no.
- Drawing no.
- Order document no.

Assignment parameters to be applied to this method are "Field office name", "Facilities field name", "Kind of station", "Station name", "System name", and "Period". Date of equipment installation is to be retrieved according to the assignment of "Period" in this method.

3-9 I-Pipeline Data Information

Three of basic output reporting methods and five of combined output reporting methods are conceived relating to this data information group.

Assignment parameters for these output reporting methods are as follows.

- Field office name at pipeline end point
- Facilities field name at pipeline end point
- Kind of station at pipeline end point
- Station name at pipeline end point
- Kind of line pipe
- Nominal size
- Pipeline name
- Result at inspection
- Period

Remarks of the above assignment parameters are described as follows.

1) Crude oil flowing in the pipeline gathers gradually into one station along the flow from well to block station, from block station to gathering station and so on in the oil production field.

So, it is convenient to use pipeline end point for the purpose of grouping pipeline. When pipeline is assigned, we use the name of place where the pipeline end point belongs to.

Pipeline end point is defined as the downstream side of pipeline in case of production line and as the upstream side of pipeline in case of injection line.

A description is made relating to the purpose and function of the method as follows.

3-9-1 Basic Output Reporting Method

There are three of basic output reporting methods I0-1, I0-11 and I0-12, which are referred to the page AI-174. of APPENDIX I. Followings are I0-1 and its subordinate output reporting methods.

I0-1 Pipeline General

I0-11 Pipeline Resume

I0-12 Pipeline Maintenance

I0-1 is related to data information of pipeline. All the above data information can be retrieved and output at the same time in use of I0-1, while the above data information can be retrieved and output independently in a separate form in use of I0-11 and I0-12, respectively.

Assignment parameters to be applied to the respective methods are "Field office name", "Facilities field name", "Kind of station", "Station name" at pipeline end point and "Kind of line pipe", "Nominal size", Pipeline name", "Result of inspection", and "Period".

Date of installation is to be retrieved according to the assignment of "Period" in case of I0-11, while end date of work in case of I0-12. And both dates are to be retrieved simultaneously, respectively and independently in case of I0-1.

3-9-2 Combined Output Method

There are five of combined output reporting methods I1-15, which are referred to the page AI-151 of APPENDIX I.

I1 Summary of Pipeline

I1 is designed for the purpose of correlating data information related to pipeline by stations at pipeline end point. And this is the summarized report of the

above-mentioned basic output reporting method about pipeline by stations at pipeline end point.

The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Pipeline name
- Well or station name at pipeline starting point
- Objective at installation
- Nominal size
- Length
- Design pressure
- Kind and specification of line pipe
- Drawing no.
- Order document no.
- Kind of executor
- Construction cost
- Date of installation
- Invoice no.

Assignment parameters to be applied to this method are "Field office name", "Facilities field name", "Kind of station", "Station name" at pipeline end point and "Kind of line pipe", "Nominal size", "Pipeline name" and "Period". Date of installation is to be retrieved according to the assignment of "Period" in this method.

I2 Pipeline Cost Data by Kind of Line Pipe

I2 is designed for the purpose of correlating data information related to pipeline cost by kinds of line pipe. The following data items are selected to be retrieved and output according to the assignment parameters as mentioned in the latter part.

- Pipeline name
- Station name at pipeline end point
- Well or station name at pipeline starting point
- Objective at installation
- Length
 - Design pressure
 - Specification of line pipe
 - Construction cost
 - Construction cost per length
- Date of installation

Assignment parameters to be applied to this method are

"Field office name", "Facilities field name", "Kind of station", "Station name" at pipeline end point and "Kind of line pipe", "Nominal size", "Pipeline name", and "Period". Date of installation is to be retrieved according to the assignment of "Period" in this method.

I3 Pipeline Cost Data by Year (of Installation)

I3 is designed for the purpose of correlating data information related to pipeline cost by years. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Pipeline name
- Station name at pipeline end point
- Well or station name at pipeline starting point
- Objective at installation
- Nominal size
- Length
- Design pressure
- Kind and specification of line pipe
- Construction cost
- Date of installation

Assignment parameters to be applied to this method are "Field office name", "Facilities field name", "Kind of station", "Station name" at pipeline end point and "Kind of pipeline", "Nominal size", and "Period". Date of installation is to be retrieved according to the assignment of "Period" in this method.

I4 Summary of Pipeline Maintenance (by Maintenance)

I4 is designed for the purpose of correlating data information related to pipeline maintenance. And this is the summarized report of the above-mentioned basic output reporting method about pipeline maintenance. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Pipeline name
- Well or station name at pipeline starting point
- Kind of line pipe
- Nominal size
- End date of work
- Period of work
- Kind and name of executor
- Kind of repair
- Kind of inspection
- Result of inspection
- Maintenance cost
- Invoice no.
- Order document no.
- Report no.

Assignment parameters to be applied to this method are "Field office name", "Facilities field name", "Kind of station", "Station name" at pipeline end point and "Kind of line pipe", "Result of inspection" and "Period". End date of work is to be retrieved according to the assignment of "Period" in this method.

15 Pipeline Maintenance Cost Data (by Year)

15 is designed for the purpose of correlating data information related to maintenance cost of pipeline. The following data items are selected to retrieve and output according to the assignment parameters as mentioned in the latter part.

- Pipeline name
- Well or station name at pipeline starting point
- Kind of line pipe
- Nominal size
- Date of installation
- Construction cost
- Year
- Maintenance cost per year

Assignment parameters to be applied to this method are "Field office name", "Facilities field name", "Kind of station", "Station name" at pipeline end point and "Kind of line pipe", and "Period". End date of work is to be retrieved according to the assignment of "Period" in this method.

Chapter 4.

CONCEPTUAL SYSTEM DESIGN

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Chapter 4 Conceptual System Design

In this chapter, conceptual system design was made on the basis of the results of the analysis of the output reporting methods proposed in Chapter 3.

Firstly, a data structure was established as the basis of the system design, and then estimates were made, by structures, for the data volume accumulated presently in PERTAMINA Unit EP-II and the data volume to be updated by years. Secondly, assignment parameters proposed in Chapter 3 and data in the data structure were investigated and some of data items were selected for coding of which a format and method were recommended.

In addition, master files such as field master, well master, zone master and station master were proposed to establish independently of the data base so as to improve the efficiencies of the system function.

As for data processing, a conception is made for input-output processing and processing for data proof.

Lastly, as for programs to be utilized, an introduction of IMS (Information Management System) to the system was recommended and COBOL as recommended as a main computer language for utility and estimates were made for the number of line statements of the application programs to be prepared for the system.

In the followings, the data structure is described in Section 1, the data volume in Section 2, the code system in Section 3, the master file in Section 4, the data processing in Section 5 and the program in Section 6.

4-1 Data Structure

Data structure has been established based on the results of the analysis of the output reporting method proposed in Chapter 3. For this purpose, data items were selected for the data structure and properties among one another were investigated. In the course of analysis, the format, the length and the frequency of occurrence of data were made clear and taking into account following characteristics of data, it was concluded to recommend that data be processed and handled by means of a batch system.

- 1) There is time to update data.
- 2) Abundance of data is apt to be processed at one time.

In conclusion, the data structure has been established as shown in APPENDIX II, taking into consideration an efficiency of data retrieval and an easiness of data processing on the data base. Features of the data structure and summarized as follows:

- 1) The structure is the special mark of a hierarchical structure with seventeen root segments. The root segment is located at the first level and consisted of the minimum unit data which have a higher frequency of retrieval.
- 2) Structures have the said seventeen root segments on the top level followed by segments at second and third levels.
- 3) Followings are the abbreviation and full name of the seventeen structures with the above root segments and number of segments under the respective root segment.

<u>Abbreviation</u>	<u>Name</u>	<u>Number of segment</u>		
		<u>1st lev.</u>	<u>2nd lev.</u>	<u>3rd lev.</u>
A-1	Right Holder's Area	1	2	1
A-2	Geological Survey	1	1	
A-3	Geological Analysis	1	2	1
A-4	Resource Prospect	1	1	
A-5	Map and Figure	1	2	
A-6	Report	1	1	
B	Geophysical Data	1	5	11
C	Well Data	1	21	5
D	Petrophysical and PVT Analysis Data	1	1	1
E-1	Production and Injection	1	2	3
E-2	Oil Consumption	1	1	
E-3	Gas Consumption	1	1	
F	Reserves Data	1	2	
G-1	Well Test and Stimulation	1	5	1
G-2	Field Laboratory Fluid Analysis	1	4	
H-1	Station	1	2	
H-2	Equipment	1	1	
I	Pipeline Data	1	1	

4-2 Data Volume

Estimates were made for the data volume as shown in Table 4-1, on which the system design and the conception of computer hardware as mentioned in the latter part were based.

In the table, accumulated data volume means the data volume accumulated and stored presently in PERTAMINA Unit BP-II and yearly data volume means the data volume to be updated yearly for the data bank system.

The accumulated data volume is limited to;

- Geological and geophysical data since 1966
- All well data
- Production data for five years
- Existing production facilities

Premises for estimates are, as follows, by data information groups.

(1) A-Geological Data and Right Holder's Area Information

The following data had been accumulated for the period 1967 to 1979.

- 20 each right holder's areas
- 10 times surveys
- 90 times analyses
- 100 prospects
- 5000 sheets of maps and figures
- 650 volumes of reports

(2) B-Geophysical Data Information

The following data had been accumulated for the period 1967 to 1977.

- 32 times seismic surveys
- 2 times magnetic surveys
- 3 times well velocity surveys
- 10 times special surveys
- 2500 sheets of maps
- 300 volumes of reports

(3) C-Well Data Information

- 370 production wells (73 natural flowing, 99 gas lifting and 198 pumping).
- 1080 non-producers
- 85 wells drilled during 1976 to 1978
- 237 times workovers during 1976 to 1978

(4) D-Petrophysical and PVT Analysis Data Information

- 28 times core analyses during 1967 to 1977
- 6 times PVT analyses during 1967 to 1977

(5) E- Production Data Information

- 408 producers
- 5 injectors

(6) F-Reserves Data Information

- 600 oil reservoirs
- 200 gas reservoirs

(7) G-Production Operation Data Information

- 150 times production tests for a year
- 4 times injection tests for a year
- 150 times subsurface pressure survey for a year
- 10 times production logs for a year
- 150 times well stimulations for a year
- 100 times field laboratory fluid analyses for a year

(8) H-Production Facilities Data Information

- 54 stations
- 1,138 equipments

(9) I-Pipeline Data Information

- 1491 pipelines

Table 4-1 Data Volume of Each Structure

No.	Abbreviation of Structure	Name of Structure	Number of Segments	Accumulated Data Volume	Yearly Data Volume
1	A-1	Right Holder's Area	4	150 [KB]	5 [KB]
2	A-2	Geological Survey	2	20	2
3	A-3	Geological Analysis	4	200	20
4	A-4	Prospect	2	50	5
5	A-5	Map and Figure	3	2,500	300
6	A-6	Report	2	400	50
7	B	Geophysical	17	3,500	400
8	C	Well	27	15,000	1,000
9	D	Petrophysical and PVT Analysis	3	50	10
10	E-1	Production and Injection	6	15,000	2,000
11	E-2	Oil Consumption	2	20	6
12	E-3	Gas Consumption	2	20	6
13	F	Reserves	3	3,500	500
14	G-1	Well Test and Stimulation	7	1,500	200
15	G-2	Field Laboratory Fluid Analysis	5	1,700	200
16	H-1	Station	3	100	10
17	H-2	Equipment	2	600	60
18	I	Pipeline	2	1,000	100
		(Total)	96	45,310	4,874

4-3 Code System

A proposal is made for an establishment of the code system of data items. For this purpose, the assignment parameters in Chapter 3 and the data items in APPENDIX II were investigated and as results, data items of 148 each were selected for coding from the standpoint that these would be in use of high frequency. In addition, these were classified into two groups, an assignment parameter code for common use of more than two data information groups and an assignment parameter code used only for a specific data information group.

Followings are a proposal of format and method for coding.

4-3-1 Assignment Parameter Code for Common Use

Following data item were selected as assignment parameters for common use.

- Province
- Area
- Field office
- Field
- Facilities field
- Well
- Formation
- Reservoir unit
- Layer
- Station
- Map and figure
- Report
- Well status
- Kind of reservoir

As for "Unit name", it is not necessary to prepare the code in the data base because discrimination among units can be accomplished by the data base itself which has the unit name. Coding for the assignment parameters for common use are proposed as follows.

(1) Province Code, Area Code, Field Office Code

As for "Province", one character for the code is conceived due to the reason because it is reported to be the administrative district with six districts in Unit-II and no change in its number be expected in the future. As for "Area", two characters for the code are conceived because it is reported to be four areas that have been defined by PERTAMINA for the purpose of the operational use and therefore, the number might increase in accordance with the progress of a development.

As for "Field office", one character for the code is conceived because it is reported to be two field office presently at PERTAMINA and it will not exceed number of ten in the future even increased by the development progress.

Following is an example of the code and the full name related to the above three items.

	<u>Code</u>	<u>Full Name</u>
Province	1	Jambi
	2	S. Sumatra
	3	W. Sumatra
	4	Riau
	5	Bengkulu
	6	Lampung
Area	01	South Palembang District
	02	Middle Palembang District
	03	Musi District
	04	Jambi District
Field office	1	Bajubang
	2	Prabumulih

The above code and name will be correlated and be made use of in the system as exemplified in the following. Ten characters are provided for the full name of Province and fifteen characters for the full name of "Area" and "Field Office". Therefore a proper abbreviation has to be given to the full name which exceeds the above respective character numbers.

Example

Province	[2]	[S . S U M A T R A]	(10)
Area	[0 4]	[J A M B I D I S T R I C T]	(15)
Field office	[2]	[P R A B U M U L I H]	(10)

() shows number of characters

(2) Field Code

Field code is provided for the field name and the prospect name. About sixty fields are reportedly in Unit EP-II and about fifty prospects are estimated in Unit EP-II. Three characters for the code are conceived to be sufficient even that the number of field and prospect be increased according to the progress of development. APPENDIX III shows the list of the name of field and prospect of Unit EP-II being reported. Coding for the above should be made by PERTAMINA taking convenience of operational usage into account. The code, the abbreviation and the name will be correlated and be made use of in the system as exemplified in the followings.

The abbreviation is provided especially for the output to avoid diffuseness which might result in difficulty of the output design.

Twenty-five characters will be provided for the full name and three characters for the abbreviation. Therefore, a proper abbreviation has to be given to the full name.

Example

Code	Name	Abbreviation									
<table border="1"><tr><td>021</td></tr></table>	021	<table border="1"><tr><td>K</td><td>U</td><td>A</td><td>N</td><td>G</td></tr></table>	K	U	A	N	G	<table border="1"><tr><td></td><td></td><td></td></tr></table>			
021											
K	U	A	N	G							
(3)	(25)	(3)									

() shows number of characters

(3) Facilities Field Code

It is reported that about twenty-five facilities field exist presently in Unit EP-II and these will never be more than ninety-nine in future. As results, two characters for the code are conceived to be more than sufficient. APPENDIX III shows the list of the name of facilities field of Unit EP-II being reported.

Coding for the above should be made by PERTAMINA taking convenience of operational usage into account. The code, the abbreviation and the name will be correlated and be made use of in the system as exemplified in the followings.

The abbreviation is provided for the output due to the same reason as mentioned in Field code. Fifteen characters will be provided for the name and three characters for the abbreviations.

Therefore, a proper abbreviation has to be given to the full name.

Example

Code	Name	Abbreviation															
<table border="1"><tr><td>01</td></tr></table>	01	<table border="1"><tr><td>T</td><td>A</td><td>N</td><td>J</td><td>U</td><td>N</td><td>G</td><td>T</td><td>I</td><td>G</td><td>A</td></tr></table>	T	A	N	J	U	N	G	T	I	G	A	<table border="1"><tr><td>T</td><td>J</td><td>T</td></tr></table>	T	J	T
01																	
T	A	N	J	U	N	G	T	I	G	A							
T	J	T															
(2)	(15)	(3)															

() shows number of characters

(4) Well Code

It is reported that about one thousand-four hundreds wells exist at present in Unit EP-II. Well code is conceived to consist of Field code and the sequence number attaching to by fields.

Three characters for the sequence number will be sufficiently provided because any field never happen to have more than 999 wells.

As for the name of well, it is proposed to be defined as a composition of a field name and its number like "KUANG-001" or "LIMAU-M001". A proper number, therefore, has to be attached to by fields by PERTAMINA taking convenience of operational usage into account.

Well code will be made use of in the system as exemplified in the following.

Example

Code		Name																		
<table border="1"><tr><td>0</td><td>2</td><td>1</td></tr></table>	0	2	1	-	<table border="1"><tr><td>0</td><td>0</td><td>1</td></tr></table>	0	0	1	-	<table border="1"><tr><td>L</td><td>I</td><td>M</td><td>A</td><td>U</td><td>-</td><td>M</td><td>0</td><td>0</td><td>1</td></tr></table>	L	I	M	A	U	-	M	0	0	1
0	2	1																		
0	0	1																		
L	I	M	A	U	-	M	0	0	1											
(3)		(3)		(30)																

() shows number of character

(5) Formation Code

It is reported that eight formations exist at present in Unit EP-II. However, two characters for the code are conceived taking an increase of number according to the development progress into consideration.

The code and the name are proposed as follows.

<u>Code</u>	<u>Full name</u>	<u>Abbreviation</u>
01	Kasai Formation	KAF
02	Muara Formation	MUF
03	Air Benaket Formation	ABF
04	Gumai Formation	GUF
05	Batu Raja Formation	BRF
06	Talang Akar Formation	TAF
07	Lahat Formation	LAF
08	Basement	BAS

The code, the abbreviation and the name will be correlated and be made use of in the system as exemplified in the following.

The abbreviation is provided especially for the output to avoid diffuseness like "Talang Akar Formation".

Fifteen characters are provided for the full name of a formation and three characters for the abbreviation. Therefore, a proper abbreviation has to be given to the full name.

Example

Code	Name	Abbreviation
0 6	T A L A N G A K A R	T A F
(2)	(15)	(3)

() shows number of characters

(6) Reservoir Unit Code

It is reported that about one thousand reservoir units exist presently in Unit EP-II.

Reservoir unit code is conceived to be in use of all the time together with Field code.

In response to a request of the counterpart, the reservoir unit code prevailing used in Unit EP-II is to be introduced into the system in the form as it is.

Followings are part of the code and the name related to the reservoir unit code being reported.

<u>Code</u>	<u>Name</u>	
110-2101	a0a1 ABC	BLOCK I
-2102	a0a1 ABC	BLOCK II
-2103	a0a1 ABC	BLOCK III
-2201	DHF	BLOCK I
-2202	DHF	BLOCK II
-2203	DHF	BLOCK III
-2301	H	BLOCK I
-2302	H	BLOCK II
-2303	H	BLOCK III

The code and the name are correlated and are made use of in the system as exemplified in the following.

Twenty characters are provided for the full name and four characters for the code.

A proper abbreviation has to be given to the full name which exceeds the above character numbers.

Example

Code	Name
2 1 0 1	a0a1 ABC BLOCK I
(4)	(20)

() shows number of characters

(7) Layer Code

It is reported that about one thousand layers exist presently scattered in the different fields in Unit EP-II.

Layer code is conceived to be use of together with field code. As one field has only thirty layers more or less at the maximum, two characters for the code are sufficiently provided.

Followings are the name of the layers in the Kenali Asam field and part of layers being reported.

<u>Code</u>	<u>Name</u>
01*	B ₁
	B ₂
	C
	F
	L
	M
	N
	O
	P
	R
	S

* : an example of code

The code and the name are correlated and are made use of in the system as exemplified in the following.

Five characters are provided for the full name. Therefore a proper abbreviation has to be made for the full name which exceeds the above numbers.

Example

<u>Code</u>	<u>Name</u>
01	a32

(2)

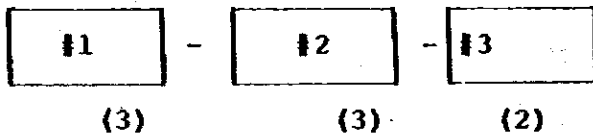
(5)

() shows number of characters

(8) Station Code

It is reported that about sixty stations exist presently in Unit EP-II. Three characters for the code are conceived taking an increase of the station numbers according to the development progress into consideration.

As for the name of station, it is proposed to be defined as a composition of an abbreviation of facilities field name and an abbreviation of kind of station and a sequence number as mentioned below. A proper sequence number has to be attached to by PERTAMINA taking convenience of operational usage into account.



() shows number of characters

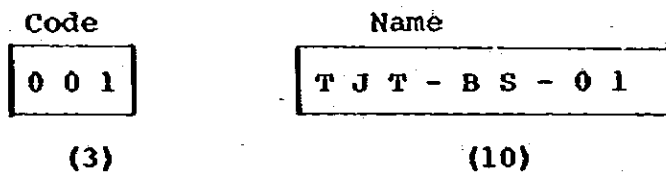
#1: An abbreviation of facilities field name (refer to APPENDIX III-11)

#2: An abbreviation of kind of station (refer to APPENDIX III-69)

#3: Sequence number

The code and the name are correlated and are made use of in the system as exemplified in the following.

Example



TJT is an abbreviation of Tanjung Tiga.
BS means block station (Max 3 characters).

() shows number of character

(9) Map and Figure Code

As exemplified in the following, this code consists of the code which assigns an information group classified in Chapter 3, kind of map and the reference number utilized presently in Unit EP-II.

As described in the latter part, kind of map includes kind of figures.



(1) (2) (10)

(.) shows number of characters

#1: Code for information group, refer to page 15 of Chapter 3

#2: Kind of map (Refer to APPENDIX III)

#3: Reference number

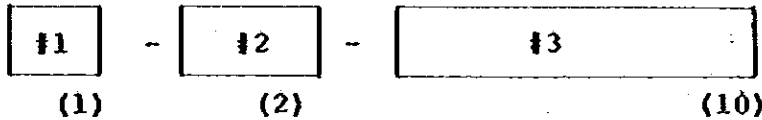
One character is provided for the information group abbreviated as A to I in page 15 of Chapter 3.

Two characters are provided for the code of kind of map which has a different classification by information groups as shown in APPENDIX III.

Ten characters are provided for the reference number so that PERTAMINA has a choice which kind of reference numbers utilized presently would be better to be assigned to the system.

(10) Report Code

As exemplified in the following, this code consists of the code which assigns an information group classified in Chapter 3, kind of report and reference number utilized presently in Unit EP-II.



() shows number of characters

#1: Code for information group, refer to Chapter 3

#2: Kind of report (Refer to APPENDIX III)

#3: Reference number

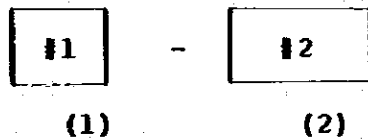
As mentioned previously, one character is provided for the information group.

Two characters are provided for the code of kind of report which has a different classification by information groups as shown in APPENDIX III.

Ten characters are provided for the reference number so that PERTAMINA has a choice which kind of reference numbers utilized presently would be better to be assigned to the system.

(11) Well Status Code

This code consists of the code of string specification and the code of current status as mentioned below:



() shows number of characters

#1: String specification (Refer to APPENDIX III)

#2: Current status (Refer to APPENDIX III)

(12) Kind of Reservoir Code

The code and name are proposed as follows.

Code	Name
11	Paraffine oil reservoir
12	Asphalt oil reservoir
20	Gas reservoir

Fifteen characters are provided for the name.

4-3-2 Assignment Parameter Code for a Specific Data Information Group

Following data items were selected for coding as assignment parameter code used only for a respective data information group.

Reference is made to APPENDIX III and the remarks made immediately after the following items.

A - Geological Data and Right Holder's Area Information

- Contract code
- Contractor code
- Survey code
- Analysis code
- Kind of contract
- Kind of survey
- Kind of analysis
- Type of trap
- Kind of map and figure
- Kind of report

B - Geophysical Data Information

- Survey code
- Method of survey
- Kind of report
- Kind of map

C - Well Data Information

- Objective of well
- Objective of workover
- Vertical or deviated
- Type of subsurface rod pump
- Macaroni pipe
- Kind of down hole trouble
- Kind of well log
- Succeeded or not in wireline formation test

D - Petrophysical and PVT Analysis Data Information

- Kind of petrophysical and PVT analysis
- Kind of analysis performed

- E - Production Data Information**
 - Kind of pressure for gas
- F - Reserves Data Information**
 - Development status of reservoir unit
 - Kind of recovery method
 - Abandon condition for gas cap zone and gas reservoir
- G - Production Operation Data Information**
 - Kind of Production test
 - Type of production test
 - Kind of injection test
 - Type of injection test
 - Kind of injection fluid
 - Type of subsurface pressure survey
 - Kind of log
 - Objective for stimulation
 - Type of stimulation
 - Kind of analysis
- H - Production Facilities Data Information**
 - Kind of station
 - Kind of equipment
- I - Pipeline Data Information**
 - Kind of station
 - Kind of line pipe

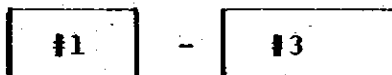
Followings are made relating to the above items.

- Contract code
- Geological survey code
- Geological analysis code
- Geophysical survey code
- Petrophysical and PVT analysis code
- Well test and stimulation code
- Field laboratory fluid analysis code
- Equipment code
- Pipeline code

(1) Contract Code

This code consists of the abbreviation of "Kind of contract" which is referred to APPENDIX III and the sequence number as shown in the following.

The sequence number by "Kind of contract" has to be prepared by PERTAMINA taking convenience of operational usage into consideration.



(2) (3) () shows number of characters

- #1: Abbreviation of kind of contract
(Refer to APPENDIX III)
- #2: Sequence number

(2) Geological Survey Code

This code, also, consists of the abbreviation of "Kind of survey" which is referred to APPENDIX III and the sequence number as shown in the following.

The sequence number by "Kinds of survey" has to be prepared by PERTAMINA taking convenience of the operational usage into consideration.



(3) (3) () shows number of characters

- #1: Abbreviation of kind of survey
(Refer to APPENDIX III)
- #2: Sequence number

(3) Geological Analysis Code

This code consists of, in the same form as geological survey code, the abbreviation of "Kind of analysis" which is referred to APPENDIX III and the sequence number as shown in the following.

The sequence number by "Kinds of analysis" has to be prepared by PERTAMINA taking convenience of the operational usage into consideration.

#1 - **#2**

(3) (3) () shows number of characters

#1: Abbreviation of kind of analysis
(Refer to APPENDIX III)

#2: Sequence number

(4) Geophysical Survey Code

This code consists of, like the previous code, the abbreviation of "Kind of geophysical survey" which is referred to APPENDIX III and the sequence number as shown in the following.

The sequence number by "Kinds of geophysical survey" has to be prepared by PERTAMINA taking convenience of the operational usage into consideration.

#1 - **#2**

(3) (3) () shows number of characters

#1: Abbreviation of kind of geophysical survey
(Refer to APPENDIX III)

#2: Sequence number

(5) Petrophysical and PVT Analysis Code

This code consists of, like the previous code, the abbreviation of "Kind of core and PVT analysis" which is referred to APPENDIX III and the sequence number as shown in the following.

The sequence number by "Kinds of core and PVT analysis" has to be prepared by PERTAMINA taking convenience of the operational usage into consideration.



(3) (3) () shows number of characters

#1: Abbreviation of kind of core and PVT analysis
(Refer to APPENDIX III)

#2: Sequence number

(6) Well Test and Stimulation Code

This code consists of "Well code", the abbreviation of "Kind of well test and stimulation" which is referred to APPENDIX III, the sequence number and year as shown in the following.

The sequence number by "Kinds of test and stimulation" during year has to be prepared by PERTAMINA taking convenience of the operational usage into consideration.



(6) (2) (2) (2)

() shows number of characters

#1: Well code

#2: Abbreviation of kind of test and stimulation
(Refer to APPENDIX III)

#3: Date (YY)

#4: Sequence number

(7) Field Laboratory Fluid Analysis Code

This code consists of the abbreviation of "Kind of field laboratory fluid analysis" which is referred to APPENDIX III and the sequence number as shown in the following.

The sequence number by "Kind of field laboratory fluid analysis" has to be prepared by PERTAMINA taking convenience of the operational usage into consideration.

#1 - **#2**

(3)

(3)

() shows number of characters

#1: Abbreviation of kind of field laboratory fluid analysis (Refer to APPENDIX III)

#2: Sequence number

(8) Equipment Code

This code consists of the abbreviation of "Kind of equipment" which is referred to APPENDIX III and the sequence number as shown in the following.

The sequence number by "Kinds of equipment" has to be prepared by PERTAMINA taking convenience of the operational usage into consideration.

#1 - **#2**

(2)

(3)

() shows number of characters

#1: Abbreviation of kind of equipment (Refer to APPENDIX III)

#2: Sequence number

(9) Pipeline Code

This code consists of "Station code" which means the end point of pipeline and is referred to APPENDIX III and the sequence number as shown in the following.

The sequence number by "Station" has to be prepared by PERTAMINA taking convenience of the operational usage into consideration.



(3)

(2)

() shows number of characters

#1: Station code (Refer to APPENDIX III)

#2: Sequence number

4-4 Master File

Considering the code system proposed in Section 3 and data properties in data structure mentioned in Section 1, data items such as Field, Well, Zone and Station have been selected from the standpoint that those are in use of high frequency and have a higher grade of independency. Taking the followings into account, these are proposed to file together with their subsequent information as master files independently of the data base.

- 1) Efficient usage of memory of disk to be for the data base.
- 2) Efficient treatment of input data and simplification of input work.
- 3) Efficient treatment of output data.
- 4) Convenience of correction, addition and deletion of data concerned.

(1) Field Master

This file is designed to have, province code, area code, and field office code, which are subordinate to field and are referred to Section 3, together with field code and the full name of field.

The format of the file is conceived as follows.

Field Code	#1	#2	#3	#4	#5	#6	Name of Field
(3)	(1)	(2)	(1)	(2)	(1)	(3)	(25)

() shows number of characters

- #1: Code of province to which the field belongs.
- #2: Code of area to which the field belongs.
- #3: Code of field office to which the field belongs.
- #4: Code of facilities field to which the field belongs.

- #5: Field or Prospect 1 - Prospect
 2 - Field
- #6: Abbreviation of field name

(2) Well Master

This file is designed to have information below-mentioned together with the format.

Well Code	#1	#2	#3	#4	#5	#6	#7
(6)	(1)	(1)	(3)	(2)	(1)	(3)	(1)

Well Name	#8	#9	#10	#17
(30)	(4)	(4)	(4)	(4)

() shows number of characters

- #1: Workover number
- #2: String code
 A - Annulus
 S - Short tubing
 M - Middle tubing
 L - Long tubing
- #3: Station code
- #4: Facilities field code
- #5: Completion status
 1 - Completed
 2 - Suspended
 3 - Abandoned
- #6: Well status (Refer to APPENDIX III)
- #7: Kind of completed zone
 1 - Oil zone
 2 - Gas cap zone
 3 - Gas zone
 4 - Water zone
- #8-#17: Reservoir code or layer code

(3) Station Master

This file is designed to have the information below-mentioned together with the format.

Station Code	#1	#2	Station Name
(3)	(2)	(2)	(10)

() shows number of characters

#1: Facilities field code

#2: Kind of station (code)

01 - Block station

02 - Gathering station

03 - Central station

04 - Heater station

05 - Compressor station

06 - Booster pump station

07 - Storage station

08 - Final delivery point

09 - Dehydration station

10 - Metering station

11 - Power station

12 - Telemetry station

13 - Other station

(4) Zone Master

This file is designed to have the information related to Reservoir unit and Layer and the format is described as follows.

Field Code	#1	#2	#3	#4	Reservoir Name or Layer Name
(3)	(4)	(1)	(1)	(1)	(10)

() shows number of characters

#1: Reservoir unit code

#2: Reservoir unit or Layer

1 - Reservoir unit

2 - Layer

#3: Kind of reservoir

1 - Oil reservoir

2 - Gas reservoir

#4: Development status of reservoir unit (Refer to

APPENDIX III)

4-5 Processing

Processing procedure was conceived in this section on the basis of the output reporting method in Chapter 3 in parallel with the code system in Section 3 and the master file in Section 4.

4-5-1 Processing Procedure for Output

Three processing procedures are conceived for output data processing. In this processing, instruction parameter cards will be prepared in accordance with the assignment parameters proposed in Chapter 3. An appropriateness of these cards will be proved at the input and the data retrieved according to the instruction will be output.

The processing procedures conceived here could be processed with a margin by a utilization of the present available computer source in Unit II.

(1) Output Procedure - 1

Data are output in the same order as stored in the data base. This will be applicable to the basic output reporting methods as proposed in Chapter 3. Figure 4-1 shows the flowchart for output procedure - 1.

(2) Output Procedure - 2

Data are rearranged and output according to the instructions given by the instruction parameter cards. This will be applicable to the combined and statistical output reporting methods proposed in Chapter 3. Figure 4-2 shows the flowchart for output procedure - 2.

(3) Output Procedure - 3

Data are output correlating the data stored in tape with

the data stored in data base.

This will be applicable to such a output reporting method as production history report which requires to retrieve their data in chronological order.

Figure 4-3 shows the flowchart for output procedure - 3.

4-5-2 Processing Procedure for Input

The format and proof method for input data were investigated on the basis of the analysis results of the data structure as proposed in Section 1 in connection with the code system proposed in Section 3 and the master file proposed in Section 4.

The investigation was made on the premises that an input mediator be diskette taking the present PERTEMINA's computer resources into account.

The result of the investigation is as follows.

(1) Processing Flow

The master files proposed in Section 4 and a cumulative files would be made use of in processing procedure for input, taking the efficiency into account.

A cumulative file is the file to prove the appropriateness of the input data and rearrange these so as to match with the instruction at updating of data base.

Figure 4-4 shows a general flowchart for input procedure.

(2) Input Data Format

The format of input data on diskette to be used as an input mediator is conceived as follows.

#1	#2	#3	Keep blank for a margin	Input Data
(1)	(4)	(2)	(3)	(118)
Control Area			Data Area	

() shows number of characters

- #1: Identification for correction
 - Blank or I - Data for inserting
 - R - Data for replacement
 - D - Data for deletion
- #2: Segment name
- #3: Sequence No. in a segment

(3) Processing Procedure for Data Proof

Followings are conceived for proving input data and the result would be confirmed by the output of error lists, proof lists and confirmation lists.

- logical proof on data structure
- proof correlating data with data in master file
- logical proof of data itself
- logical proof of code for data
- logical proof at updating of data

Fig. 4-1 Flowchart for Output Procedure-1

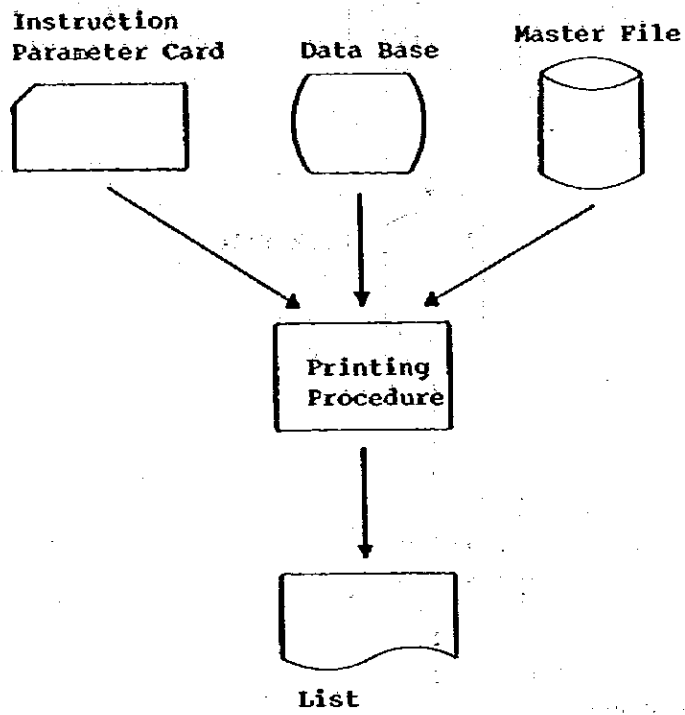


Fig. 4-2 Flowchart for Output Procedure-2

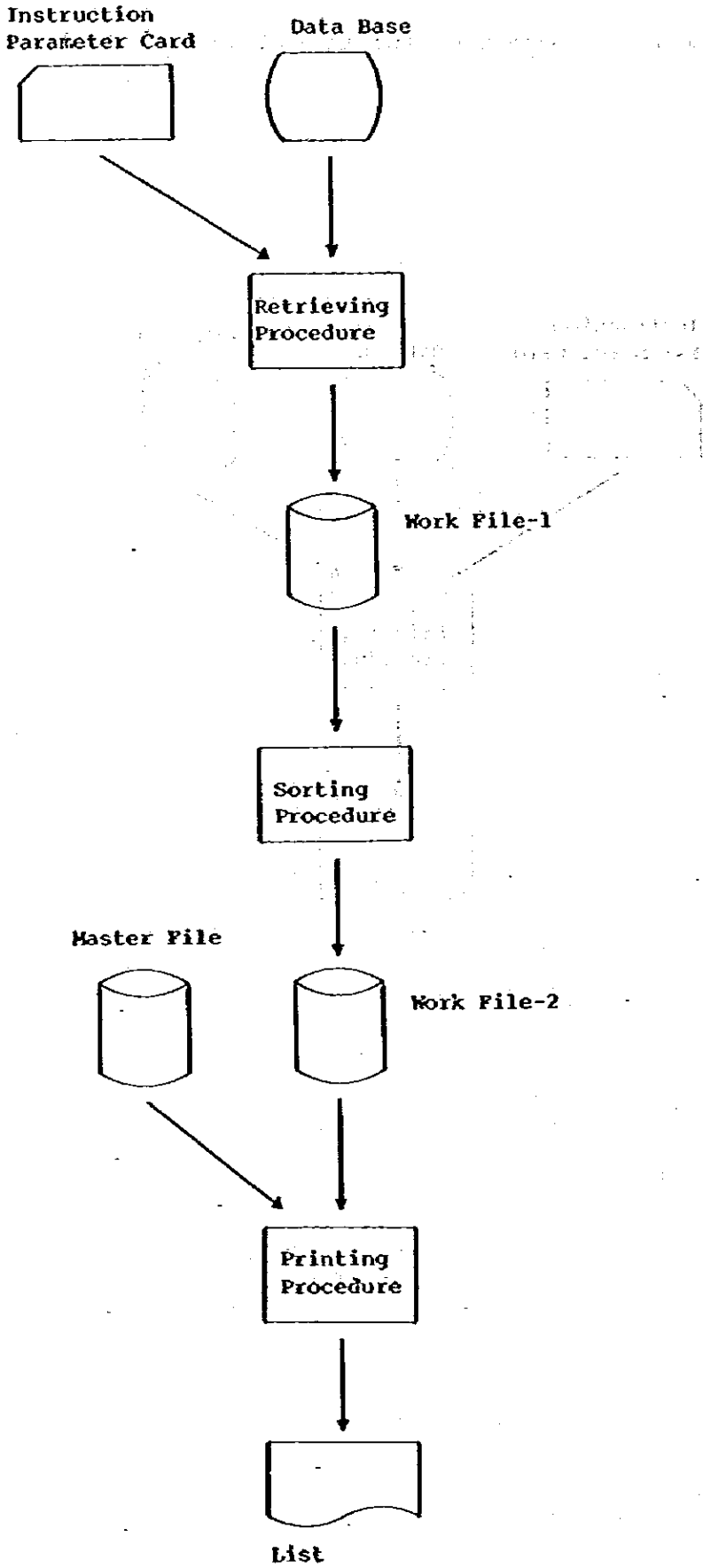


Fig. 4-3 **Flowchart for Output Procedure-3**

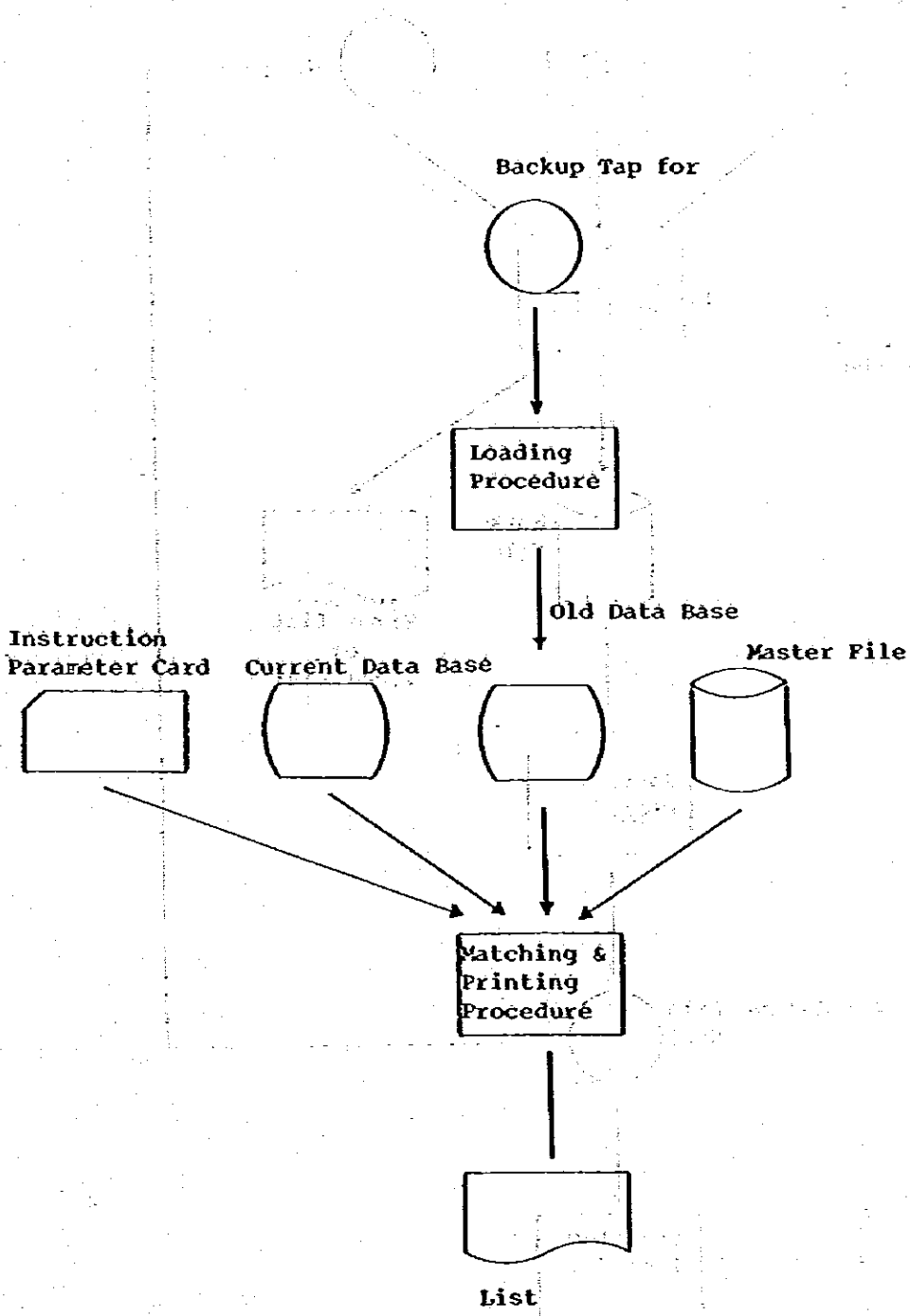
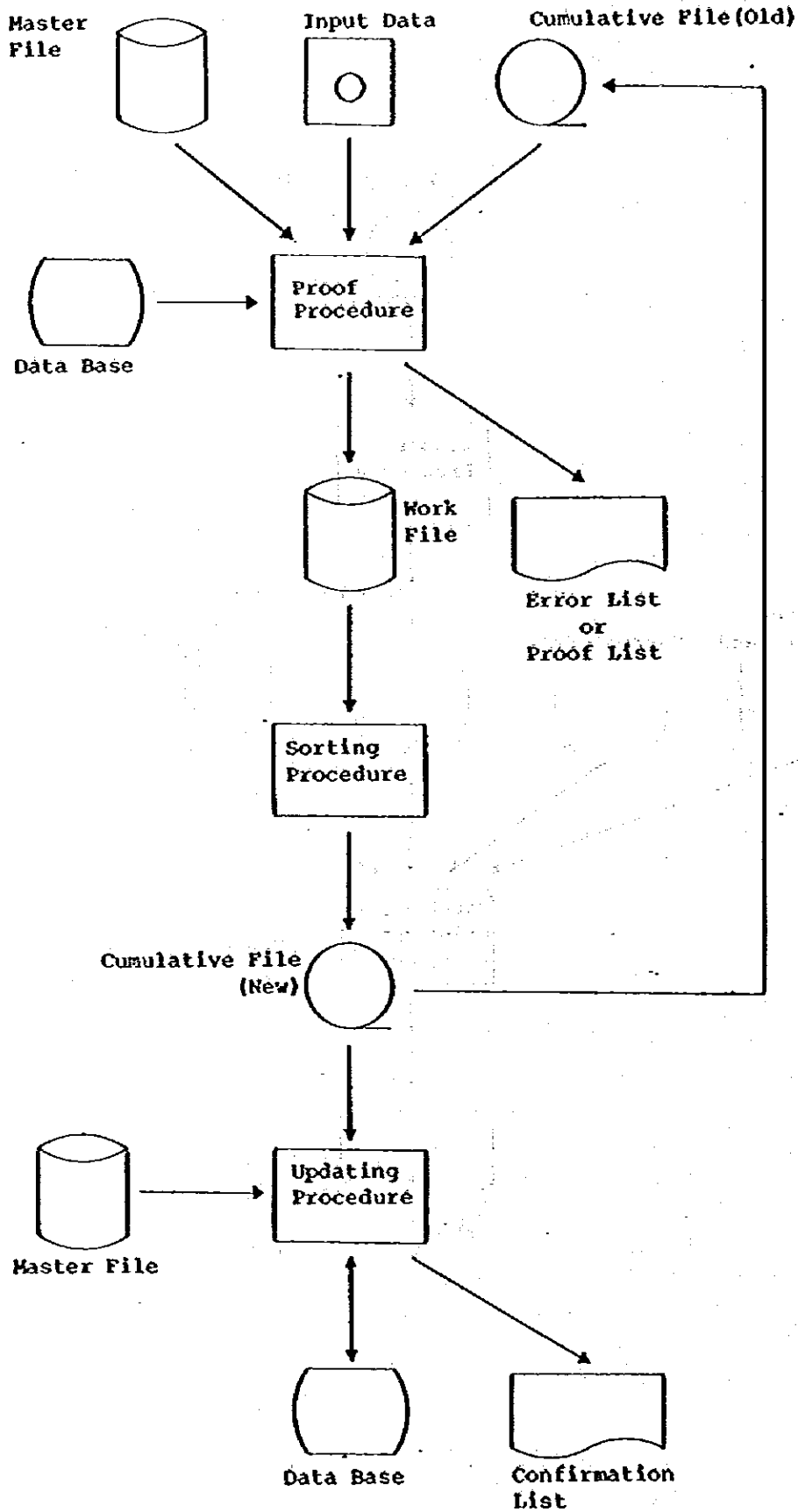


Fig. 4-4 Flowchart for Input Procedure



4-6 Computer Program

In connection with computer programs to be utilized for the data bank system, an investigation was made for the utilization of IMS, the computer language to be utilized in the system, utility programs to be required, and number of line statements of application programs to be prepared.

These results are as described in the following.

(1) Utilization of IMS

Utilization of IMS (Information Management System) is recommended for processing of data base of the following reasons.

- 1) The data structure established in Section 1 of Chapter 4 is hierarchical.
- 2) PERTAMINA have a enough experience to handle IMS in Jakarta head office and, also, have a plan to introduce this to Unit-II.
- 3) This have a high versatility to enlarge to a on-line system in future.

Following advantages are expected in utilizing IMS for processing of data base.

- 1) To enable to avoid the duplication of data stored in the data base.
- 2) To reduce work for correction of programs which are modified according to a modification of data structure.
- 3) To enable a comprehensive management and control of data in data base.

(2) Computer Language

COBOL is recommended to use as a main computer language for the data bank system because of the following reasons.

- 1) There are abundance of data with character and less data with numeric.
- 2) There are relative abundance of basic output reporting methods which output data in same order as stored in data base.
- 3) It can be applicable to the system with IMS.
- 4) COBOL is mainly utilized in PERTAMINA at present.

(3) Utility Program

Following utility programs would be required for operation of the data bank system.

- 1) Utility programs to be required for operating the system.
- 2) Utility programs to be used for the following purposes in connection with IMS utilization.
 - definition of system
 - description for data base
 - preparation of program specification block
 - maintenance of blocks for a control of application programs
 - security of data base
 - analysis of system logs
 - loading data base with data
 - rearrangement of data base
 - dumping data from data base and duplicating data base
 - recovery of data base
 - control utility programs

3) Utility programs having the following function

- sorting and merging
- loading data disk to tape
- loading data tape to disk
- loading data disk to disk

(4) Number of Line Statement of Application Programs

An estimation was made for number of line statements of application programs to be prepared for the data bank system and described as follows, itemized as in input data processing and output data processing.

1) Input Data Processing

proof and conversion	17,000	Line statement
establishment of data base	10,000	
updating of data base	19,000	
updating of master file	4,000	
	<hr/>	
Sub total	50,000	

2) Output Data Processing

basic output reporting method	9,000
combined output reporting method	28,000
statistical output reporting method	41,000
	<hr/>
Sub total	78,000
	<hr/>
Total	128,000

