



DIDIDOM LTD.



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Company Profile & Modernization Refinery Project



Sofia - 2025



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Introduction

DIDIDOM is a limited company, established at Sofia the capital of Bulgaria in 2011 with commercial registration No. 201658957.

DIDIDOM focus to be the most significant refining and petroleum Products and to be a major player in Europe. DIDIDOM (Plama) refinery consider a second biggest refinery in Bulgaria, since 2014 DIDIDOM accelerate our steps to modernization the refinery and construct a terminal tank in different location in Europe to serve our future business in this field. Also, we active in the field of crude oil & Gas drilling, extracting and pipelines.



DIDIDOM Mission



We process natural resources to fuel the future



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DIDIDOM Core Values



Main subsidiaries of DIDIDOM

- 1 • **DIDIDOM refinery** - Bulgaria 2014
- 2 • **Varna Port Tank Terminal** - Bulgaria
- 3 • **DIDIDOM Tank Terminals S.L.** - Spain
- 4 • **DIDIDOM Niger pipeline** - Niger (crude oil & Gas drilling Project and consturct & operate of 1073 Km Pipeline)
- 5 • **DIDIDOM MINA** - Saudi Arabia (shipyard project & Croude Oil and Gas drilling)
- 6 • **DiDIDOM Gas** - Bulgaria (Manufacturing of anti explosion bottel Gas and own how to know technogy) started 2017



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DIDIDOM Business Segments



**Drilling
Crude oil
wells and
extrcting**



**Crude Oil
and Gas
Pipeline
Projects**



**Crude Oil
Refining**



**Petroleum
Products**



**Tank
Terminals
distribution
Centers**



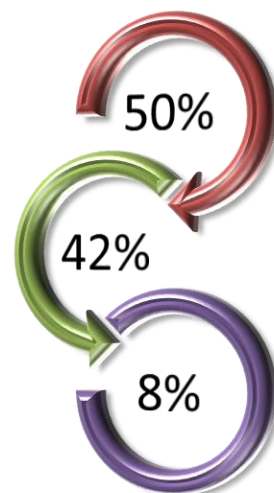
**Manufc.
Anti
explosion
Bottel Gas**

DIDIDOM's Shareholders

Mr. Domingo Vilar - Spain

Eng. Ghassan Osrah - Saudi Arabia

other invetors





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DIDIDOM key Managment

Mr. Domingo Vilar

President of DIDIDOM



Eng. Ghassan Osrah

Vice President of DIDIDOM





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Board of Directors

Mr. Domingo G. Vilar
President

Eng. Ghassan Osrah
Vice President

Mr. Robert Guesnet
CEO

Mrs. Violena Nencheva
Director

Miss. Diana Angelova
Finance Director

Mr. Stefan Bojadiev
Secretary





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PRESENTATION OF MODERIZATION REFINERY PROJECT

Currently the refinery working with 10-12 % of the total capacity. DIDIDOM refinery is the second largest Bulgarian oil refinery with design capacity of **1,100,000 MT**. The refinery was the sole producer of Base Oils in Bulgaria with design capacity of **209,000 MT**. and it's located on a total area of **3,200,000 m²** in the North Central part of Bulgaria 15 km away from the district center town of Pleven (the 7th largest Bulgarian town) and 150 km North East from the Bulgaria capital (Sofia) and About 300 km away from the Black Sea (town of Varna) and 32 km from the Danube River.

The refinery was acquired by Highway Logistics Center EOOD, presently P.R of DIDIDOM Ltd., with an objective to revamp operations and position itself as a significant regional player in the refining business. DIDIDOM Ltd has a unique opportunity to become a leading supplier of petroleum products, Base and ready oils in Southeast Europe by capitalizing on:

- Access to cheap raw material – crude oil imported from Russia / Caspia region.
- Modernization of existing units to achieve optimal product mix while minimizing costs



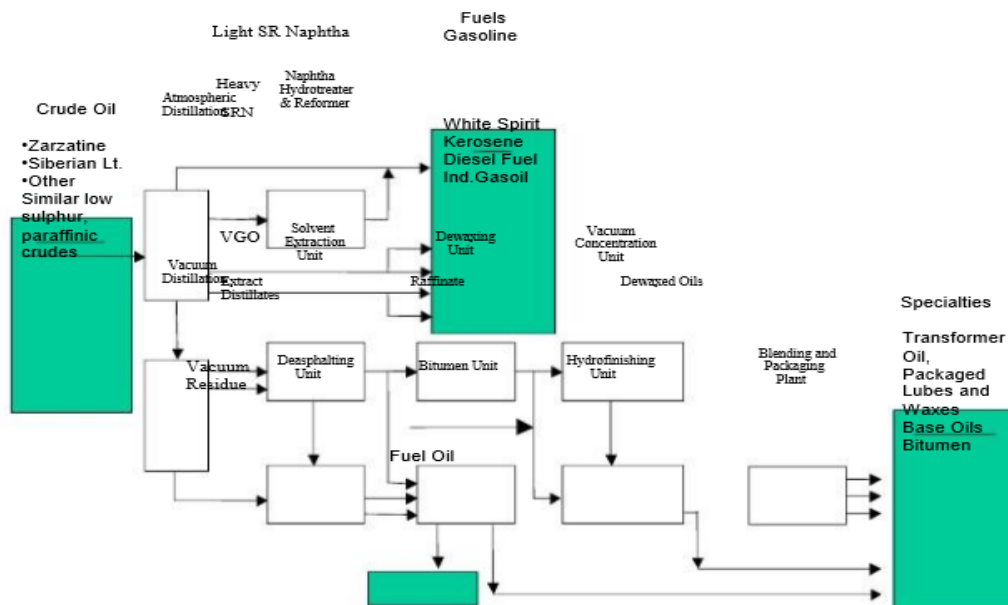
All refineries in the region require heavy investment programs to modernize operations



Technological obsolescence of all refineries in the region

General Information

The old flow diagram of the refinery is given below. The units description is given in Appendix



Objectives

The revitalization of Refinery through state-of-art crude oil processing technologies aims to meet the following objectives:

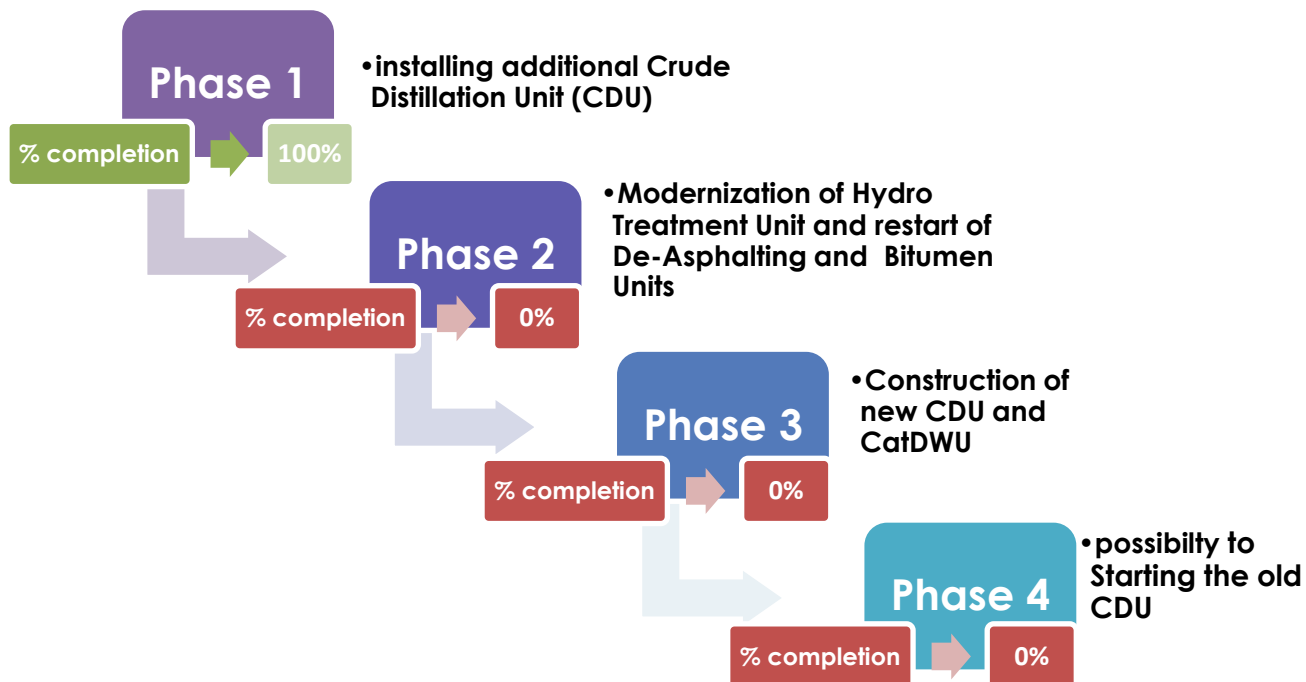
1: Modernization of Refinery and revival of the main production activities

2: Optimal utilization of the land and infrastructure, free from the main refinery activity.



Refinery Modernization Project Phases

The refinery modernization will be executed in 3 main phases (1,2 & 3) described in



Increase flexibility in the quantity of processed crude by installing additional Crude Distillation Unit (CDU). Termination of unprofitable production activities and obsolete processing units. Adding an extension to the CDU – a Pre-flash column that would allow the separation of benzenes (light and heavy naphtha) from the crude. Step 1 have been completed already: A new CDU has been constructed with capacity of 280,000 tons per month (can be easily increased to 320,000 depending on the operations effectiveness). The new CDU has two main components:

- Atmospheric Distillation Column, where Crude Oil is separated into oil cuts, by simple distillation, based on the difference in boiling temperatures of the components.

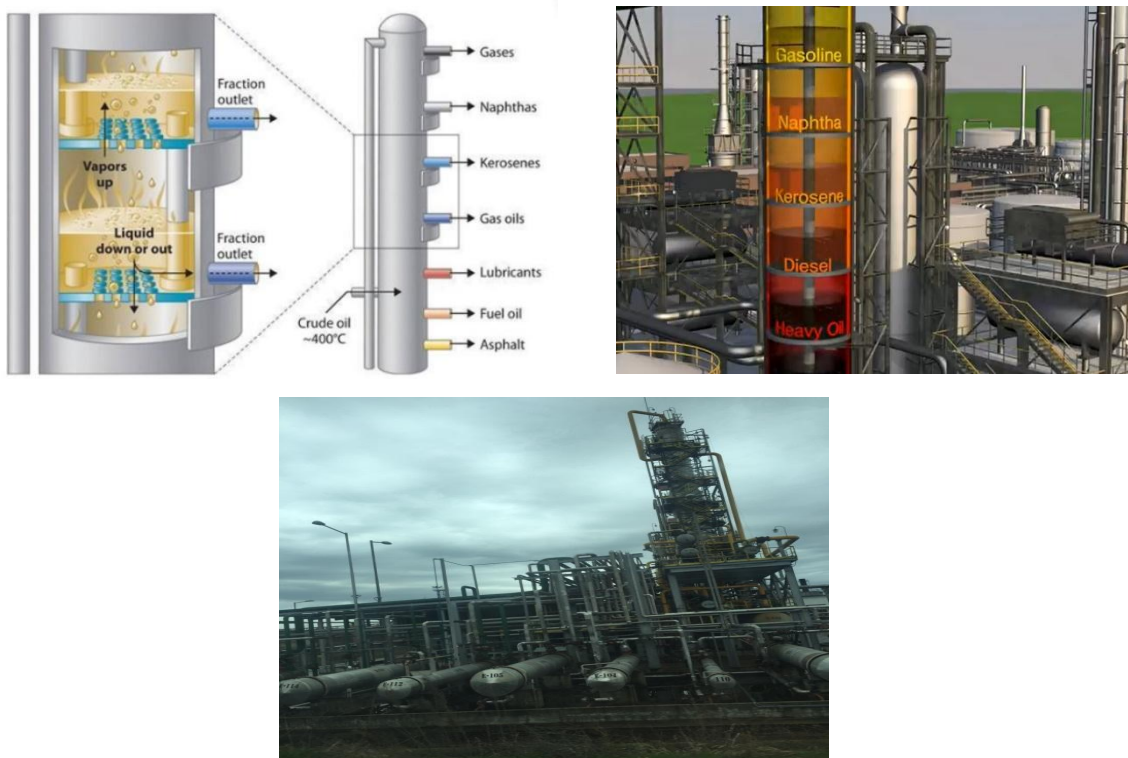


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- Vacuum Distillation Column, which separates the heavier components produced. The extension of the CDU is in construction. It will add a Desalination unit and a Pre-flash Column. It will allow crude oil to be processed and will add light and heavy naphtha to products, thus avoiding the supply of crude composite which can be tricky technically. This will make the refinery independent from its suppliers.

In addition to the above, if the Refinery has secured long term supply of crude and market for its products it may utilise the old CDU as well and thus reach working capacity of 1.7 million tons.

The figure below summarizes the production process of Phase I:



Phase 2

% completion

0%

completion time

9 months

Modernization of Hydro Treatment Unit and restart of De-Asphalting and Bitumen Units
- Two streams from the existing HTU will be modernised for treatment of Atm. Gasoil. The capacity of each stream will be 160,454 MT/month for production of low sulphur diesel <10mg/l S content.

- Third stream of the existing HTU will be used for hydro-finishing of base oils. --- Construction of a new Hydrogen plant for H₂ production, needed for operations of HTU and Hydro de-waxing.
- Repair of the existing De asphalting unit (DAU) and change of the instrumentation.



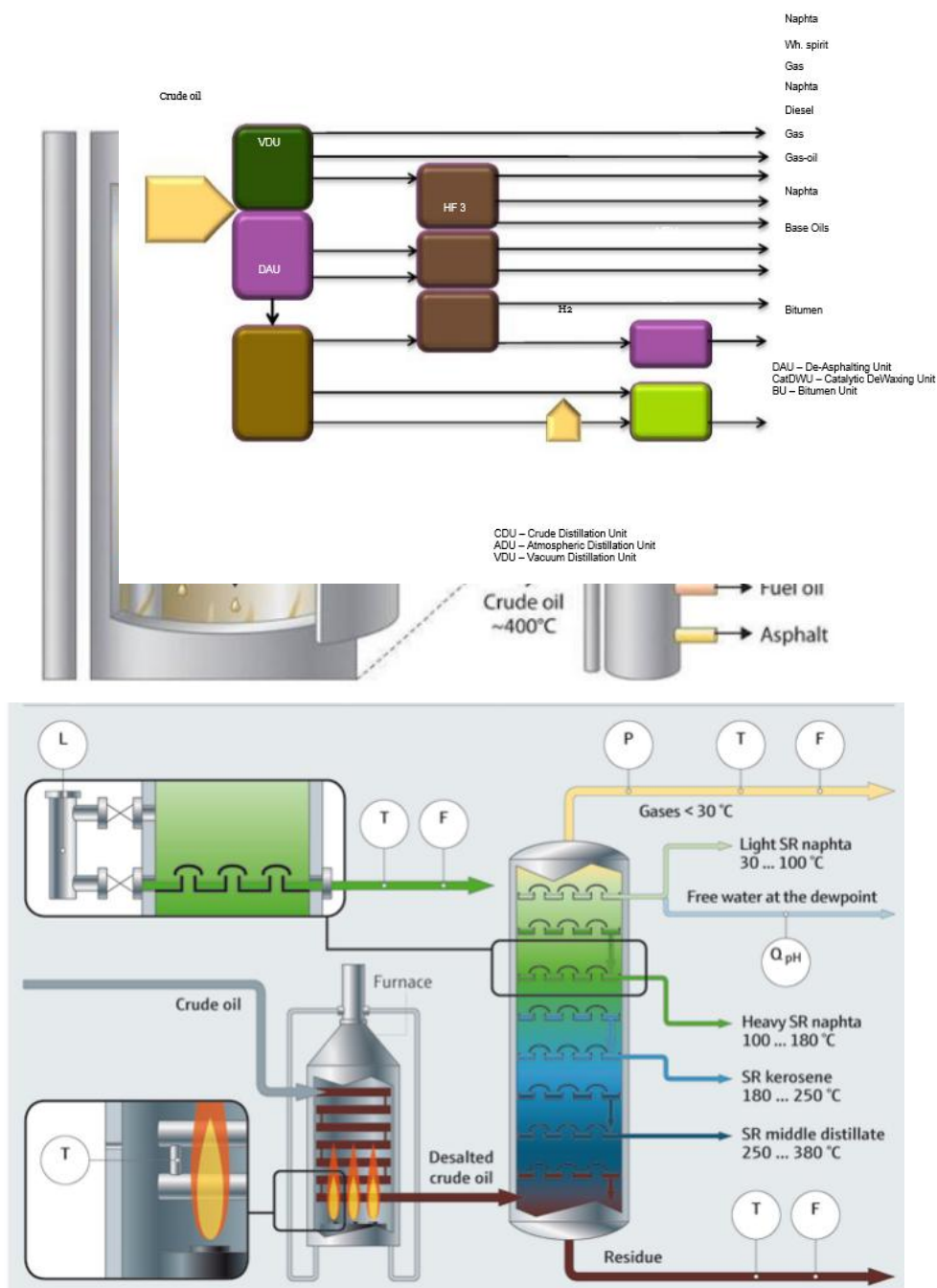
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- Repair of the Bitumen Unit (BU).

Key observations:

- The main technology remains the same Gasoline is discontinued, while the production of the remaining products is optimized throughout the current processing units
- The new technological scheme is applicable, since the crude composite from the CDU will have low percentage of sulphur (up to 0,4% m/m).

The figure below summarizes the production process of phase II





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Phase 3

% completion

0%

completion time

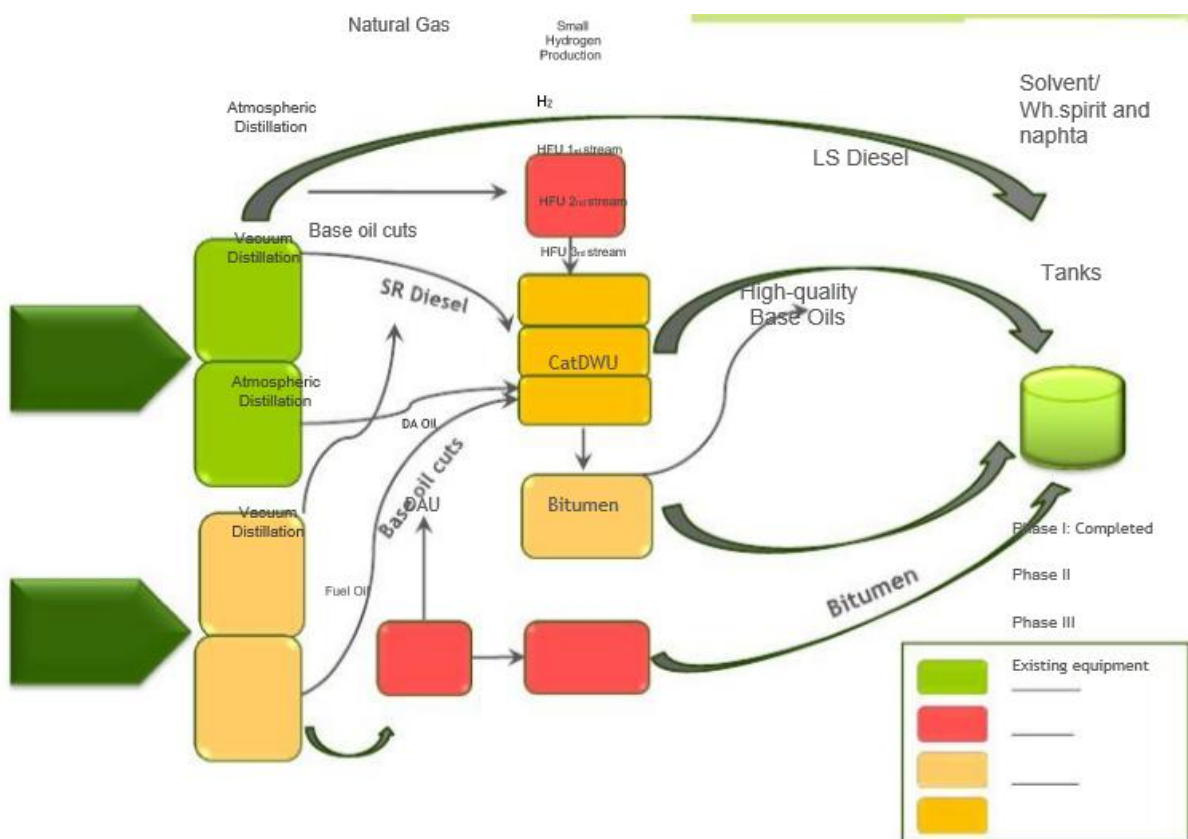
9 months

Construction of new CDU and CatDWU New CDU will be constructed to double the production capacity of the refinery compared with step II. The unit will have the same capacity as CDU from step I, so the total capacity for oil processing of both units will be 164,000 tons/month. The place of the new CDU will be at the same location as the first one and the DCS control system will be mutual for both units.

New Catalytic Dewaxing Unit will be constructed that will use higher compression ratio. Base oil cuts from CDU and De-asphalted oil from DAU will be hydro- finished using the 3rd stream of the HFU and will then be used as a feed for CatDWU. The Hydrogen Production Unit will be upgraded in order to meet the requirements of the CatDWU.

The capacity of the DA will be increased by start-up of the second stream which will be non-working in step II.

The final refinery flow diagram after completion of Phase 3





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The Refinery would be highly versatile allowing the production to be easily adjusted to the actual products demand at each moment.

Phase 4

Possibilities for increase of the capacity of the Refinery, there is a way in which the Refinery may increase its capacity if the Refinery has secured long term supply of crude and market for its products:

Starting the old CDU with capacity of 1 million tons per month and the third stream to the HFU, as well as the addition of a Hydro- Cracking Unit.

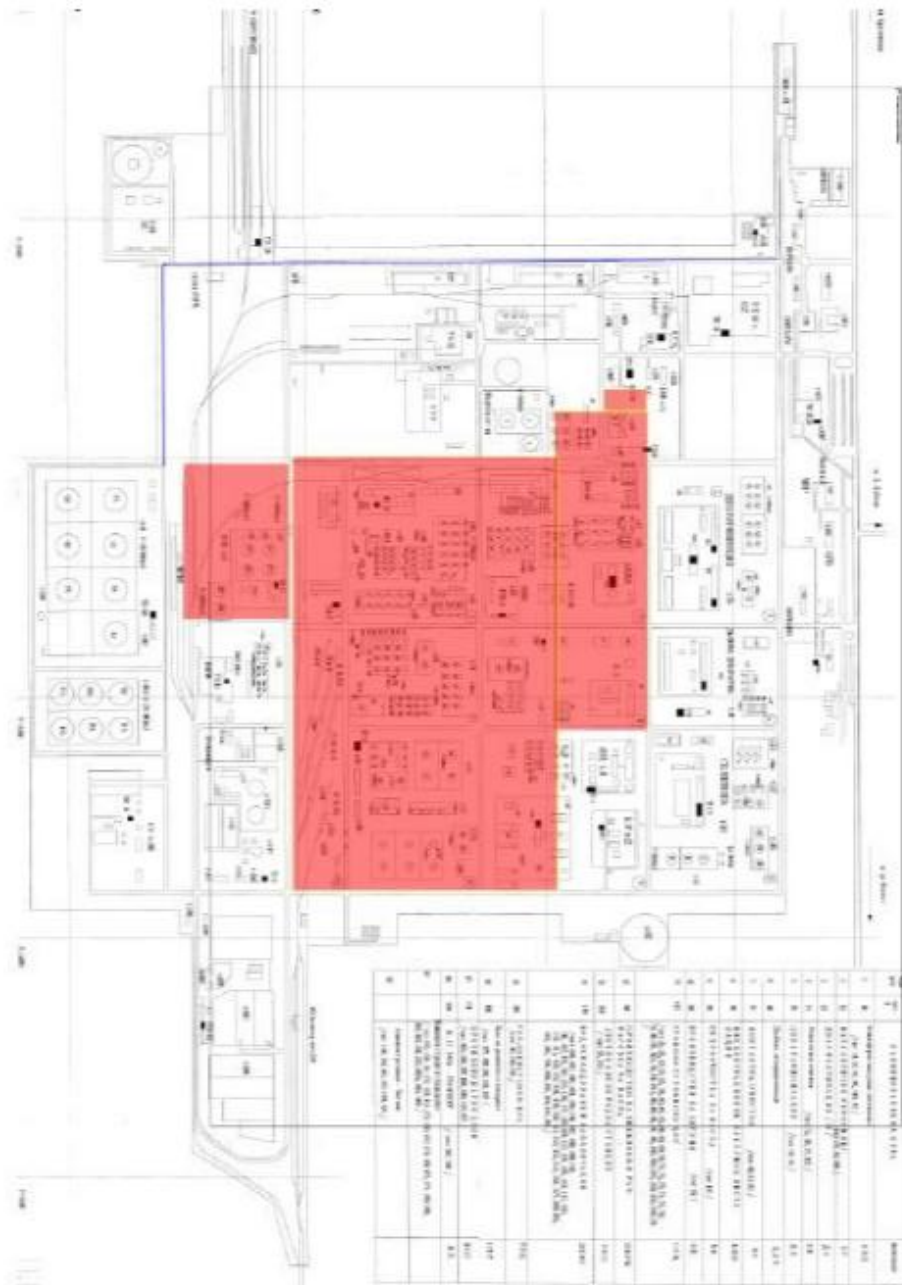
This will increase the capacity of the Refinery to ca. 1.5 million tons (in this case the capacity of the new units should also meet the relevant feed capacity).

The refinery flow diagram for 1.5 million tons processing is presented on the next slide.



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Layout of the refinery part (red one)





New Crude Distillation Unit 1/3



Supply of Oil Tanks and Oil Preheating • Crude oil is temporary stored in refinery tanks, from where it is pumped to the Atmospheric Distillation Unit with an approximate pressure of about 14 barg and temperature of about 25°C. • At the inlet of the unit, crude oil passes through a train of seven heat exchangers, where the energy available in the system is utilized to rise the crude oil temperature. The train raises the crude temperature from 25°C to about 267°C. • In order to raise the temperature of the crude, up to the necessary temperature of its distillation (330°C), a Crude Heater is placed after the preheat train. • Heater, besides increasing oil temperature up to the entry level in the column, also produces superheated steam required for stripping crude oil, in column, and atmospheric gasoil, in side stripper. • Crude Oil distillation is performed in the atmospheric distillation column, which separates oil cuts, by simple distillation, based on the difference in boiling temperatures of the components. This tower has 36 trays divided in two diameter sections: the first one from tray 1 to 14 with an internal diameter of 1600 mm, and the second one from tray 14 to 36 with a diameter of 2000 mm.

- The tower operates in a pressure range of 1.15 (top) to 1.4 (bottom) barg, and in a temperature range of 160-165° (top) to 300-330° C (bottom).

The 100-C101 can be divided into three sections:

- Overhead section
- Atmospheric Gasoil section
- Residue section

New Crude Distillation Unit (2/3)

Overhead Section • The top vapours which leaves the column goes in the heat exchanger, where are partially condensed and then finally cooled to 70 °C in the water cooler. • The white spirit from this section is used as a reflex and the excess white spirit produce is sent to the tank farm.

Atmospheric Gasoil Section • From tray 15, atmospheric gasoil (AGO) is drawn off as side product. Part of it is used as a pump around to remove heat, which influences the quality of the side products, through column's temperature profile alteration. • The atmospheric gasoil (product) is taken from the column to the side stripper. Stripped atmospheric gasoil from the



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bottom of the side stripper is pumped cooled in order to reach the temperature of 40°C, required for storage. Residue Section • The atmospheric residue, is removed from the column and sent to the vacuum heater.

Vacuum Distillation Unit Atmospheric Residue Heater • Atmospheric residue with a temperature of about 305 °C, is routed to the heater to raise the temperature up to about 395°C, the optimum temperature for vacuum column operation. The fuel used is a liquid one (vacuum residue).

Vacuum Fractionator

- Vacuum distillation is performed in the column, which aims to separate the cuts with boiling temperature over 270°C. The column is connected to a vacuum system.
- The tower operates in a pressure range of 30 (top) to 100 (bottom) mmHg and in a temperature range of 55-57° (top) to 290-295° C (bottom).
- The column has 13 trays and it can be divided in three sections:
 - Vacuum Gasoil section
 - Transformer Distillate section
 - Residue section

Vacuum Gasoil Section

- Vacuum gasoil is removed from tray 3. A part of VGO is sent as a reflux at the top of the vacuum column, in order to maintain the overhead temperature and the rest is sent to tank farm. Transformer Distillate Section

- Transformer Distillate may be drawn from trays 6, 7 or 8 of the columns to the vessel. From this vessel the liquid is sent to the crude oil preheat train, to recover heat and then it is finally cooled to 90°C, the required temperature for storage.

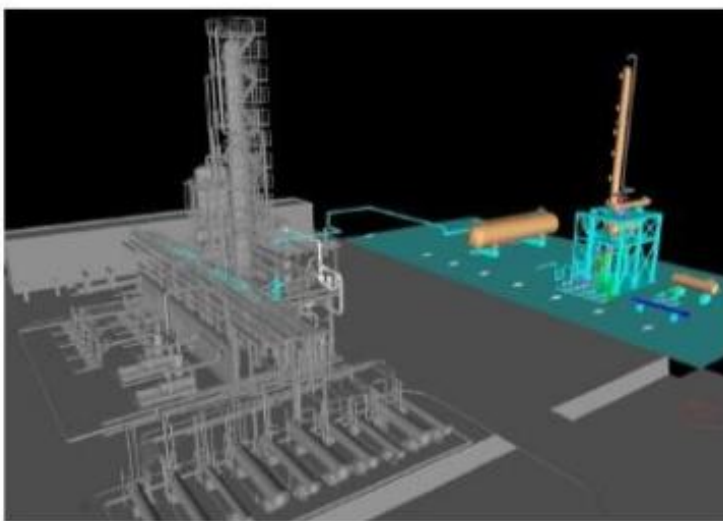
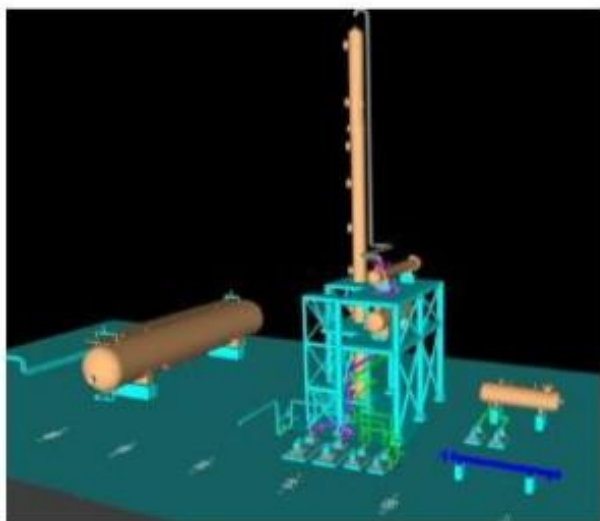
Vacuum Residue Section

- From the bottom of the column vacuum residue is drawn both, as a product and for pump around. Both are used for preheating the crude oil.

New CDU extension project – Pre-flash Column



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Light Crude Oil pre-flash distillation is performed in the atmospheric distillation column 200-C200, which at the top naphtha product, by simple distillation, based on the difference in boiling temperatures of the components. This tower has 25 trays with an internal diameter of 1000 mm. The temperature of the partially vaporized light crude feed is controlled by TIC 100- 2--.

It is bypassing a part of the vacuum residue stream entering the shell of the heat exchanger 100-E-118, in such a way that the inlet temperature of the column to be around 220 °C. The preheated light crude enters the tower, in the flash zone, on tray 23. The tower operates in a pressure range of 0.21 (top) to 0.7 (bottom) barg, and in a temperature range of 116° (top) to 211° C (bottom)

Reservoir Park (1/5)

Tank No.	Product	Tank farm No.	Tank volume, [m3]	Tank bottom [m3]	Operational capacity, [m3]	Level measurement	Tank monitoring system	Valves	Inlet/outlet Ø mm
9a	Crude	101	20000	1300	15000	float		manual	400/350
10a	Crude	101	20000	1300	15000	float		manual	400/350
11a	Crude	101	20000	1300	15000	float		manual	400/350
12a	Crude	101	20000	1300	15000	float		manual	400/350
13a	Crude	101	20000	1300	15000	float		manual	400/350
14a	Crude	101	20000	1300	15000	float		manual	400/350
1	Crude	50	5000	244	3856	float		manual	200/80
2	Crude	50	5000	244	3856	float		manual	200/80
3	Crude	50	5000	244	3856	float		manual	200/80
4	Crude	50	5000	244	3856	float		manual	200/80
5	Crude	50	5000	244	3856	float		manual	200/80
6	Crude	50	5000	244	3856	float		manual	200/80
219	kerosine	73	600	20	580	float		manual	100/80
220	LVN	73	600	20	580	float		manual	100/80
221	LVN	73	600	20	580	float		manual	100/80
222	LVN	73	600	20	580	float		manual	100/80
223	hydrogenizate	74	400	30	270	float		manual	100/80
224	hydrogenizate	74	400	30	270	float		manual	100/80
225	IGO	74	700	48	552	float		manual	100/80
226	IGO	74	700	48	552	float		manual	100/80
227	White spirit	74	400	30	270	float		manual	100/80
228	White spirit	74	400	30	270	float		manual	100/80
229	HVN	74	3000	85	2570	hydrostatic		manual	200/150
230	HVN	74	3000	85	2570	hydrostatic		manual	200/150
231	HVN	75	5000	120	3980	hydrostatic		manual	250/150
232	Diesel	75	5000	120	3980	float		manual	250/150
233	Diesel	75	5000	120	3980	float	yes	manual	250/150
234	Diesel	75	5000	120	3980	float	yes	manual	250/150
235	Fuel oil	76	1000	40	810	float	yes	manual	150/100
236	Fuel oil	76	1000	40	810	float		manual	150/100
237	Fuel oil	82	400	25	325	float		manual	100/80
238	Fuel oil	82	400	25	325	float		manual	100/80
239	Fuel oil	82	100	7	83	float		manual	100/100
240	Fuel oil	82	100	7	83	float		manual	100/100
241	Fuel oil	82	100	0	0	float		manual	100/50

Reservoir Park (2/5)



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242	Fuel oil	82	200	12	148	float	manual	150/100
243	Fuel oil	82	200	0	0	float	manual	150/100
244	Fuel oil	82	400	12	148	float	manual	150/80
250	Fuel oil	82	400	25	325	float	manual	150/80
251	Fuel oil	82	400	23	327	float	manual	150/80
281	destillates	82a	400	23	327	float	manual	150/80
282	destillates	82a	400	23	327	float	manual	150/80
283	Ado	82a	5000	200	3800	float	manual	250/250
284	ADO	82a	5000	200	3800	float	manual	250/250
285	LVN	74a	2000	80	1620	float	manual	200/80*2
286	reformate	74a	5000	80	1620	float	manual	200/80*2
274	reformate	IBEG	5000	200	3700	float	manual	200/150
275	reformate	IBEG	2000	90	1620	float	manual	200/150
276	LVN	IBEG	2000	90	1620	float	manual	200/100
277	LVN	IBEG	1000	90	1620	float	manual	200/100
278	LVN	IBEG	5000	60	640	float	manual	200/100
279	Gasoline	IBEG	5000	250	3650	float	manual	200/150
280	Gasoline	IBEG	5000	250	3650	float	manual	200/150
119	Transformer base component	65	700	30	600	radar		150/80
120		65	700	30	600	float		150/80
121		65	700	30	600	radar		150/80
122		65	700	30	600	radar	yes	150/80
123		65	700	30	600	float		150/80
124		65	700	30	600	float	yes	150/80
125		65	700	30	600	float		150/80
126		65	700	30	600	float		150/80
127		65	700	30	600	float		150/80
128		65	700	30	600	float		150/80
129	SN 350	65	700	30	600	float	manual	150/80
130	SN 350	65	700	30	600	float	manual	150/80
131	SN 350	65	700	30	600	float	manual	150/80
132	SN 600	65	700	30	600	float	manual	150/80
133	BS	65	700	30	600	radar		150/80
134	BS	65	700	30	600	float	manual	150/80
135	BS	65	700	30	600	float	manual	150/80
136	oil	66	100	7	83	float	manual	150/100
137	Motor oils	66	100	7	83	float	manual	150/100
138	oil	66	100	7	83	float	yes	150/100
139	oil	66	100	7	83	float	manual	150/100
140	oil	66	100	7	83	float	manual	150/100

Reservoir Park (3/5)

141	oil	66	100	7	83	float	manual	150/100
142	oil	66	100	7	83	float	manual	150/100
143	oil	66	100	7	83	float	manual	150/100
144	oil	66	100	7	83	float	manual	150/100
145	SN 1500	66	100	7	83	float	manual	150/100
146	oil	66	100	7	83	float	manual	150/100
147	oil	66	100	7	83	float	manual	150/100
148	oil	66	100	7	83	float	manual	150/100
164	oil	94a	700	30	600	float	manual	150/100
165	oil	94a	700	30	600	float	manual	150/100
166	oil	94a	700	30	600	float	manual	150/100
180	SN 150	84	2000	65	1735	float	manual	200/80
181	SN 150	84	2000	65	1735	float	manual	200/80
182	oil	84	700	30	600	float	manual	350/100
183	oil	84	700	30	600	float	manual	350/100
184	oil	84	700	30	600	float	manual	350/100
185	oil	84	700	30	600	float	manual	350/100
186	oil	84	400	20	340	float	manual	200/150
187	oil	84	400	20	340	float	manual	200/150
188	oil	84	400	20	340	float	manual	200/150
189	oil	84	400	20	340	float	manual	200/150
190	oil	84	400	20	340	float	manual	200/150
191	oil	84	400	20	340	float	manual	200/150
192	oil	84	400	20	340	float	manual	200/150
193	oil	84	1000	20	340	float	manual	200/150
194	oil	84	1000	40	840	float	manual	350/80
195	oil	84	1000	40	840	float	manual	350/80
196	o	84	1000	40	840	float	manual	350/80
197	SN 1500	84	1000	40	840	float	manual	350/80
198	SN 150	84	1000	40	840	float	manual	350/80
199	SN 1500	84	1000	40	840	float	manual	350/80
200	SN 1500	84	1000	40	840	float	manual	350/80
201	SN 600	84	1000	40	840	float	manual	350/80
202	SN 600	84	1000	40	840	float	manual	350/80
203	SN 600	84	1000	40	840	float	manual	350/80
204	oil	84	400	20	340	float	manual	150/80
205	o	84	400	0	0	float	manual	150/80
206	o	84	400	0	0	float	manual	150/80
207	o	84	400	0	0	float	manual	150/80
208	oil	84	200	12	168	float	manual	150/80

Reservoir Park (4/5)



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209	oil	84	200	12	168	float	manual	150/80	
210	oil	84	200	0	0	float	manual	150/80	
211	oil	84	200	0	0	float	manual	150/80	
212	oil	84	200	12	168	float	manual	150/80	
213	oil	84	200	12	168	float	manual	150/80	
214	oil	84	200	12	168	float	manual	150/80	
215	oil	84	200	12	168	float	manual	150/80	
216	oil	84	200	12	168	float	manual	150/80	
217	oil	84	200	12	168	float	manual	150/80	
218	oil	84	200	12	168	float	manual	150/80	
mixer1A	oil	21	20	0	20	radar	manual	100/100	
mixer2A	oil	21	20	0	20	radar	manual	100/100	
mixer3A	oil	21	20	0	20	radar	manual	100/100	
mixer4A	oil	21	20	0	20	radar	manual	100/100	
mixer5A	oil	21	8	0	20	radar	manual	100/100	
mixer6A	oil	21	8	0	8	radar	manual	100/100	
mixer7A	SN 350	21	8	0	8	radar	manual	100/100	
mixer8A	SN 150	21	8	0	8	radar	manual	100/100	
28	Sort Residue	54	200	15	160	radar	manual	150/150	
29	Sort Residue	54	200	15	160	radar	manual	150/150	
30	Sort Residue	54	200	15	160	radar	manual	150/150	
31	Sort Residue	54	200	15	160	radar	manual	150/150	
66	IGO	60	700	30	590	hydrostatic	manual	100/80	
67	IGO	60	700	30	590	hydrostatic	manual	100/80	
68	IGO	60	700	30	590	hydrostatic	manual	100/80	
69	IGO	60	700	30	590	hydrostatic	manual	100/80	
70	Wh.sp	60	700	30	590	hydrostatic	yes	manual	100/80
71	Wh.sp	60	700	30	590	hydrostatic	yes	manual	100/80
72	crude	61	1000	40	840	hydrostatic	yes	manual	100/80
73	crude	61	1000	40	840	hydrostatic	yes	manual	100/80
74	crude	61	1000	40	840	hydrostatic	yes	manual	100/80
75	crude	61	1000	40	840	hydrostatic	yes	manual	100/80
76	crude	61	1000	40	840	hydrostatic	yes	manual	100/80
77	crude	61	1000	40	840	hydrostatic	yes	manual	100/80
78	IGO	60	700	30	590	hydrostatic	yes	manual	100/100
79	igo	60	700	30	590	hydrostatic	yes	manual	100/100
80	igo	60	700	30	590	hydrostatic	yes	manual	100/100
252	Fuel oil	20	500	25	425	float	yes	manual	150/150
253	Fuel oil	20	500	25	425	float	yes	manual	150/150
254	residue	20	500	25	425	float	yes	manual	150/150
							yes		

Reservoir Park (5/5)

255	residue	20	500	25	425	float		manual	150/150
256	Fuel oil	20	500	20	430	float		manual	200/100
257	Fuel oil	20	500	20	430	float		manual	200/100
258	Fuel oil	20	500	20	430	float		manual	200/100
259	Fuel oil	20	500	20	430	float		manual	200/100
260	Fuel oil	20	500	20	430	float		manual	200/100
261	Fuel oil	20	500	20	430	float		manual	200/100
262	Fuel oil	20	500	25	425	radar		manual	200/100
263	Fuel oil	20	500	25	425	radar	yes	manual	200/100
264	Fuel oil	20	500	25	425	radar	yes	manual	200/100
265	Fuel oil	20	500	25	425	radar	yes	manual	200/100
266	Fuel oil	20	500	25	425	radar	yes	manual	200/100
267	Fuel oil	20	500	25	425	radar	yes	manual	200/100
268	Fuel oil	20	2000	72	1728	float	yes	manual	150/150
269	Fuel oil	20	2000	72	1728	float		manual	150/150
270	Fuel oil	20	2000	72	1728	float		manual	150/150
271	Fuel oil	20	2000	72	1728	float		manual	150/150
272	Fuel oil	20	2000	72	1728	float		manual	150/150
273	Fuel oil	20	2000	72	1728	float		manual	150/150

Other facilities:

Blending and Packaging Unit (BPU)

Packaging equipment was totally replaced for the period 1998-2003.

Railway station

The refinery has its own railway station equipped with weight bridge and own working locomotive for railway tank cars shunting. The total length of the railway



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road situated on the territory is 10 km and connects the tank farms, power plant, warehouses, bitumen and lubricants production units.

Natural Gas source

The refinery has a connection with the national natural gas grid. The capacity of the connection is 20 000 normal m³/h with pressure of 6 bars. Internal natural gas circuit supplied all the units with gas.

Electricity capacity

60 MWt - reversible the refinery is connected with national electric grid by two independent lines – 110 kV. Two transformers 60 and 63 MW decrease the voltage from 110 kV to 6,3 kV. The transformer is used for receiving of electricity from the grid or for expedition of the electricity produced on the refinery territory. Six transformer distribution stations – 6,3 kV and two distribution stations are existing on the territory. Twenty-three transformers 6,3 kV to 0,4 kV are in operation.

Land, infrastructure and support assets

The land of the refinery activities is about 1 000 000 m² which is 1/3 from the total area





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Feasibility study of DIDIDOM Refinery Modernization Project



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Plama Refining Preliminary Feasibility Study

Table of Contents:

- Market for Refined Products
- Current Availability of Refined Products in PR
- Location
- Cost
- Economics

Market For Refined Products in PR

-Product: EN 590 10 ppm:

- 1-Contract with distributor Shell in Spain, islands canary, reception product in Barcelona port tank farm of CLH 24.000 MT per week, total in month 96.000 MT
- 2-Contract with Shell UK 20.000 MT per week, total in month 100.000 MT
- 3 -Contract with Italrefining 7.000 MT per month , discharge in Euroenergo tank farm in Tarragona, Spanish Mediterranean.
- 4-Contract with Petrol company local of Bulgaria with 3.000 MT per month.
- 5-Contract with Texem company with 7.000 MT per month for Nigeria
- 6-Contract with Jet oil Greek petroleum company to client of government of Albania 12.000 MT per month



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-Product Gasoline 95 MT per month:

- 1-Contract with Texem Nigeria with 7.000 MT
- 2-Contract with Jet Oil Greece with 14.000 MT
- 3-Contract with Petrol Bg with 5.000 MT

-Product Kerosene barrels per month:

- 1.- Texem Nigeria with 20.000 bb
- 2.- Aegean oil Greece with 100.000 bb

-Asfalt

Region local expected to require approximately 60 M tons of asphalt because Bulgaria have very much projects from European Union in infrastructures and roads for consume this quantity.

–Location:

In city of Pleben





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–Cost:

The total cost of project is 200 million

The time of realization is 9+9 months, 18 months in total.

This feasibility study is after 18 months when the production of refinery is in 100%

In this moment produce only 10%, when start renovation start contracts with clients, all contracts when we will demonstration of start production when is ready the first cargo the client pur BG, instrument of bank , with the value of 1 month of cargo

–Economics

TOTAL INCOME MONTH	74.400.000	7.830.000	4.600.000	86.830.000
COST CRUDE OIL + TRANSPORT+LOGISTIC				77.400.000
DIFERENTIAL				9.430.000
DIFERENTIAL YEAR				113.160.000
ASFALT	60.000 MT year	220 USD/MT		13.200.000
BENEFIT YEAR				126.360.000

Cost of renovation 200.000.000

Time of renovation 18 months

Time of come back inversion..... 18+ 19 months..... 3 years

In this study no include production of base oil and lubricants



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Estimation that prices of products go up in this next years. Contracts is the medium duration 1 year removable and 5 years





PROCESS DESIGN BASIS 3 x 60,000 BBPD

1.1. CRUDE UNIT The process design basis was :

34.3 API Agha Jari Iranian Light,

34.7 API Arabian Light,

and 32.5 API

. The bottom half of the crude tower is stainless steel, thereby, allowing sour crudes to be processed.

1.2. PRODUCT SLATE

a) LSR

b) Naphtha

c) Kerosene/Jet Fuel

d) Diesel

e) Atmospheric Gas Oil

f) Atmospheric Residual In addition to these products, a non-condensable (at near atmospheric temperature) gas mixture is generated which is used to supplement the process heater fuel. The lighter liquid products may be blended to yield jet fuel. Alternatively, jet fuel may be drawn directly from the tower at the kerosene draw point. A Merox unit is included in the process, which is used to sweeten and insure color requirements of the various grades of jet fuel desired.

1.3. REFINERY DESIGN YIELDS * Typical yields of the design from the design basis, 19.2 API, crude are tabulated below:

Product	yield BPD
LSR & Naphtha	20,500
Kerosene / Jet Fuel	7,000
Diesel	31,000
Atmospheric Gas Oil	5,000
Atmospheric Residual	116,500



2. PROCESS DESCRIPTION

Crude oil is charged to the plant by crude oil charge pumps located near the crude storage area. The crude charge pumps are paralleled by a standby spare. The crude oil is preheated by exchange with the products. Starting with heavy naphtha followed by kerosene and AGO. Crude temperature after this exchange should be near 240 F.

The crude oil enters a two (2) stage electrical desalting unit. The crude is mixed with water. The oil/water mixture passes through a gate valve, which should be set for 6-8 PSI drop to assure thorough mixing of the oil and water. The mixture then passes through the desalters where the water and dissolved salts are electrostatically coalesced, precipitated, and removed from the bottom of the desalter via level control. Heat from the water removed from the desalter is exchanged with the incoming cooling water which is then purged to the drain.

The desalted crude oil is further preheated in an additional series of heat exchangers by the residual and diesel stream raising the crude temperature to approximately 465 F. Following the heat exchange and desalting, the crude is further heated in two parallel furnaces increasing the temperature to approximately 680 F.

2.1. THE PROCESS HEATER

The original process heater is designed to deliver 48 million Btu/hr (60 million Btu/hr released), and may be fired by either fuel-oil or natural gas. Additional heater total capacity will allow for 96 million BTU/hr released. Additionally, the heater is designed to burn all of the off-gas from the overhead accumulator. The fuel oil burners are flat flame type with steam atomization. Part of the convection section of the heater is used to superheat the steam used in steam stripping.

The heater control system design is based on cascade pressure temperature criteria from the crude outlet temperature to pressure on the fuel inlet side responding to the output signal from fuel gas or fuel oil pressure. This protocol is configured so that the accumulator off gas not burned in the boiler may be utilized in the heater. When firing the process heater with natural gas the controlling regulator must be in the off position. The system is designed to eliminate deadhead exposure to the fuel oil bypass stream.

Heat input, tower bottom temperature, and the refining production rate is controlled via the feed temperature and flow rate. The tower top temperature is controlled by the amount of light naphtha which is refluxed back to the tower top after heat exchange to the atmosphere via the overhead condensers.

Intermediate tower temperature and product composition are controlled in part by the product draw rates which control the amount of internal reflux. Additional heat is removed by pump-around on the diesel and heavy naphtha side draw streams. Fractionation is further assisted by steam stripping of the crude bottoms and the side drawn products. Control parameter design implementation allows for product optimization.

2.2. PRODUCTS

Crude fractionation produces the following product streams:

2.2.1. Residual Oil

The crude heater produces hot crude oil which is fed to the crude tower above the fourth (4th) tray. The lighter components of the crude are vaporized and move up the tower, leaving a residual oil at the bottom of the tower. The residual oil is removed from the tower bottom and is pumped to the vacuum unit. A portion of the residual product may be diverted to the heater fuel oil storage tank.



2.2.2. Atmospheric Gas Oil

The initial product derived from the Atmospheric Gas Oil (AGO) is Number four (4), grade fuel oil. The AGO is drawn from the sixth (6th) tray via a control valve. The AGO draw rate affects the amount of internal AGO reflux and thereby controls the light end composition of the residual and also the heavy end composition of the AGO. By increasing the AGO draw rate, both the initial boiling point (IBP) of the residual and the end point (EP) of the AGO are increased. Conversely, by decreasing the AGO draw rate the IBP of the residual and EP of AGO is both proportionately decreased. The IBP may be increased by steam stripping in tower with the stripping being refluxed back to the crude tower via tray number nine (9). The bottoms from the AGO stripper are removed via level control and pumped through heat exchangers and product air-cooling to product storage. Provisions are built into the design for a portion of the AGO product to be diverted to the fuel-oil storage tank for use in the process heater.

2.2.3. Diesel

The second side drawn product is Number two (2) Oil or diesel, which is drawn from tray number fourteen (14) via a flow control valve. Steam stripping is accomplished in the corresponding tower's top section with the overhead returned to the crude tower at tray number nineteen (19).

Bottoms from the diesel stripper are withdrawn via a level control valve. The diesel is then pumped through heat exchangers to the product storage at approximately 110 F. Product composition is controlled by diesel draw rate, internal reflux, and external steam stripping as in the AGO section. The same description of the effect of AGO draw rate on AGO and residual composition holds for the effect of diesel draw rate on diesel and AGO composition respectively.

In addition, there is another control parameter on diesel. This control is called "pump-around". After removing heat from the diesel, a portion of diesel is recycled to the crude tower and input at tray number seventeen (17) which is three (3) trays above the diesel draw tray. This recycle is controlled via a flow control station. The gross effect of this "pump-around" is to withdraw heat from the tower and decrease the tower temperature in the region of tray number nineteen (19). This temperature change is reflected downward by the flow of the liquid and upward by the flow of the vapor. The net result is to increase the liquid available at the diesel draw by condensing some of the heavier ends of the kerosene. The initial boiling point of the diesel is decreased and the final boiling point of the kerosene is decreased.

2.2.4. Kerosene

Kerosene is drawn from tray number twenty-two (22) at a flow control station. Steam stripping is accomplished in the bottom section of the side stripper tower. Stripping is refluxed back to tray number- twenty-five (25) on the crude tower. Bottoms from the stripper are removed via a level control valve and pumped through heat exchangers to product storage. Product temperature is approximately 110F. Product composition is controlled by product draw rate similar to that described in the AGO section and also by the diesel "pump-around" described in the Diesel section.

2.2.5. Heavy Naphtha

Heavy naphtha is drawn from tray number thirty (30) via a flow control station. The product is steam stripped in top section of the side stripper with the overhead returned to tray number thirty-five (35) of the crude tower. The stripper bottoms are withdrawn via a level control station. The heavy naphtha is pumped through



exchangers to product storage. The flow controlled draw with its accompanying internal reflux is used to control product composition. Control is also affected by a heavy naphtha “pump-around” similar to that described in the Diesel section.

2.2.6. Overhead

The overhead vapors from the crude tower are cooled to 110 F in an air cooler, which also condenses a portion of the overhead stream. Overhead product temperature is controlled by blending through a bypass control valve. The cooled overhead products are accumulated in the overhead accumulator where water is removed from the boot. This water is used to supplement the desalter water requirement. Light naphtha product is removed from the overhead accumulator via level control and pumped to the caustic coalescer. Caustic is mixed with naphtha prior to being introduced to the caustic coalescer. Caustic supply to the coalescer is metered and removed via level control to a spent caustic drain. Light naphtha is removed from the top of the coalescer and sent to product storage.

The vapor from the overhead accumulator is removed under pressure and sent to the fuel gas caustic scrubber where H₂S and other impurities are removed. The vapor is then blended with natural gas for feeding the boiler and/or heaters. This gas mixture is then burned in the steam boiler with excess being burned in process heaters.

2.2.7. Jet Fuel

Heavy naphtha and kerosene may be blended by dedicated control stations to produce jet fuel. The jet fuel may be treated by the Merox process to meet the exact specification of various grades of jet fuel.

2.3. AUXILIARY EQUIPMENT

The following support equipment is optionally part of the process loop:

2.3.1. Flare

A flare system has been included which includes a knock out drum to allow products to be separated into liquid and gas components. The liquid is returned to slop and the gases are automatically flared. The flare has John Zinc flare tip with pilot and a flame front generator to ignite the pilot.

As a safety feature purge gas must be continuously vented to prevent air infiltration into the flare stack. The flare tip is equipped with an air arrestor to minimize the amount of purge gas needed. Approximately 50 CFH of natural gas is used for the purge. Approximately 250 pph of steam is supplied to the flare tip for smokeless combustion and to prevent flare tip nozzle damage. Steam flow is adjusted during operations to ensure smokeless combustion.

2.3.2. Caustic System

A single caustic system is used to scrub fuel gas and to treat other products in various areas of the plant. This system is a batch process whereby caustic is added to the scrubber and recirculated. Normal maintenance of the scrubber is based on pH and requires periodic caustic change out.

Light Naphtha product is treated in the caustic coalescer where the caustic is metered and recirculated via flow control. Spent caustic is removed via level control. Caustic is also used in the Merox system for jet fuel sweetening.



2.4. UTILITIES

Steam is provided by three (7) 120 psig saturated steam boilers. Superheated steam in the convection section of the process heater is used for product stripping. Steam is also used for deaeration, tracing, quenching hot process pumps, fuel oil atomization, smokeless combustion, snuffing on heaters and boilers, fuel oil tank heating when burning residual oil for process heat, and heating of the multiple residual oil tanks. Operations and maintenance procedures and guidelines for the steam boilers and deaerators will be provided to the new owner. Compressed air is supplied for instrument air and oxidation in the Merox Unit.

Natural gas is supplied to fire the process heater when configured for natural gas. The heater and flare stack pilot lights are configured for natural gas as well. The flare stack also uses natural gas for purging as stated above. Natural gas is Excess overhead gas is vented to the process heater or flare stack.

3. MAJOR EQUIPMENT LIST – Crude Unit

ITEM	QTY	DESCRIPTION
101	3x2	Crude Fractionating Tower, 11'-0" I.D. x 102'-0" S-S. W/2:1 ellip. heads. Code: ASME Sec. VIII, Div. I, latest edition Design Pressure: 75 psi Design Temp.: 750°F + 1/4" Material: SA-516-70 and 316 S.S. C.A. Trays: 40 Valve type Manways: 3 - 20" W/davited cover Nozzles: As required ISO# & 300# ANSI RF Insulation: 3" w/aluminum jacket caged ladder and platforms. NOTE: All trays and shells above operating temperature of 500F will be 316 S.S.
102	3x2	AGO Stripper, 48" O.D. x 16'-0" seam-to-seam and 2:1 ellip. Heads Code: ASME Sec. VIII, Div. I, latest edition Design Pressure: 75 psig Design Temp.: 650 F Material: 316 S.S. Trays: 4 - Nutter valve Nozzles: As required 150# & 300# ANSI RF Insulation: 2" w/aluminum jacket
103	3x2	Diesel Stripper, 48" O.D. x 15'-0" seam-to-seam, w/ASME Code 2:1 ellip. heads. Code: ASME Sec. VIII, Div. I, latest edition Design Pressure: 75 psig Design Temp.: 650°F Material: 316 S.S. Trays: 4 - Nutter valve Nozzles: As required 150# & 300# ANSI RF Insulation: 2" w/aluminum jacket



ITEM	QTY	DESCRIPTION
104	3x2	Kerosene Stripper, 48" O.D. x 18' -0" seam-to-seam, w/2:1 ellip. heads. Code: ASME Sec. VIII, Div. I, latest edition Design Pressure: 75 psig + 1/8" C.A. Design Temp.: 650F Material: SA-516-70 Trays: 4 - Nutter valve Nozzles: As required 150# & 300# ANSI RF Insulation: 2" w/aluminum jacket
105	3x2	Heavy Naphtha Stripper, 48" O.D. x 18' -0" seam-to-seam, w/2:1 ellip. Heads Code: ASME Sec. VIII, Div. I, latest edition Design Pressure: 75 psig + 1/8" C.A. Design Temp.: 650F Material: SA-516-70 Trays: 4 - Nutter valve Nozzles: As required 150# & 300# ANSI RF Insulation: 2" w/aluminum jacket
AC1A AC1B	3x4	Air Cooler, Overhead, carbon steel tubes, fiberglass blades, aluminum fins, fans equipped with adjustable pitch blades, and vibration switch supplied with each motor, (8) 30 hp TEFC electric motors, fan with 3093 sq. ft. of bare surface.
AC-2	3x2	Air Cooler, AGO, Diesel and Kerosene, w/carbon steel tubes, fiberglass blades, aluminum fins, fans equipped with adjustable pitch blades, and vibration switch supplied with each motor, (4) 15 hp TEFC electric motors, fan with 155 sq. ft. of bare surface for AGO, 1500 sq. ft. of bare surface for Diesel, 812 sq. ft. of bare surface for Kerosene.
C-1 C-2	3x4	Instrument Air Compressor Ingersoll-Rand Model 75T-2 compressor complete with 10 hp TEFC 480 volt, 60 cycle, 3 phase electric motor, belt guard, after-cooler, constant speed control, V-belt drive. Each unit mounted on steel base complete with piping, wiring, and start/ stop station. One operating, one spare.
D-8	3x4	Sample Cooler, 6" I.D. x 1'-8" seam-to-flange, 6" weld cap as lower head, 6"-150# ANSI RFSO flg. w/ 150# ANSI RF blind top head.
D-9	3x2	Instrument Air Receiver Code: ASME Section VIII, latest edition.
D-102	3x2	Deaerator Horizontal drum with stripping trays in the stack.
DR-1	3x2	Instrument Air Dryer, Heatless dryer for instrument air.
D-106	3x2	Overhead Accumulator, 10'-0" I.D. x 20'-0" S-S w/2:1 ellip. heads and 24" boot. Code: ASME Sec. VIII, Div. I, latest edition Design Pressure: 40 psig + 1/4" C.A. Design Temp.: 400°F Material: SA-516-70 Manway: 1 - 18" w/davited cover Nozzles: As required 150# ANSI RF



ITEM	QTY	DESCRIPTION
H-1	3x2	Crude Oil Heater 42.2 MM BTU/HR. Duty Type: Horizontal Direct Fired Flow Arrangement: Single Pass Av. Flux Rate: 10,000 BTU/HR/FT ² Burners: John Zink FCC-Q-45 Dual Fuel Tube Material: 5% Chrome 1/2% Moly Heater also contains steam superheat portion in the convection section.
SB-1 & 2	3x4	Steam Boiler Scotch Marine Firetube
TK-1	3x2	Desalter Water Storage Vertical carbon steel tank, 10'-0" seam-to-seam, 72" O.D.
TK-2	3x2	Softened Water Storage Vertical tank bolted and galvanized. 22,400 gallon capacity for 24 hour supply.
TK-5, 8	3x4	Caustic Tank Vertical carbon steel tank.
V-1A& B	3x3	Water Softener Vertical vessels, one operating, one regenerating and standing by.
V-2	3x2	Kerosene Dryer Vertical carbon steel vessel with salt charge.
V-3	3x2	Diesel Dryer Vertical carbon steel vessel with salt charge.

4. SHELL & TUBE HEAT EXCHANGERS

ITEM	QTY	DESCRIPTION
E-1 A & B	3x4	Heat Exchanger Crude/Heavy Naphtha Type: BEU Code: ASME Sec. VIII, Div. I, latest edition Size: 21 x 228 Surface Each: 978 sq. ft. Tubes: Matl. - C.S. O.D. In. - 0.750 BWG - 14 Pitch - Square-1"
E-2 A & B	3x4	Heat Exchanger Crude/Kerosene Type: BEU Code: ASME Sec. VIII, Div. I, latest edition Size: 15 x 228 Surface Each: 425 sq. ft. Tubes: Matl. - C.S. O.D. In. - 0.750 BWG - 14 Pitch - Square - 1"



E-3 A & B	3x4	Heat Exchanger Crude/AGO Type: BEU Code: ASME Sec. VIII, Div. I, latest edition Size: 15 x 228 Surface Each: 395 sq. ft. Tubes: Matl. - 5% chrome 1/2 moly. O.D. In. - 0.750 BWG - 14 Pitch - Square - 1"
E-4 A & B	3x4	Heat Exchanger Crude/Resid Type: BEU Code: ASME Sec. VIII, Div. I, latest edition Size: 29 x 240 Surface Each: 2258 sq. ft. Tubes: Matl. - C.S. O.D. In. - 0.750 BWG - 14 Pitch - Square - 1
E-5 A,B,C	3x6	Heat Exchanger Crude/Diesel Type: BEU Code: ASME Sec. VIII, Div. 1, latest edition Size: 25 x 228 Surface Each: 1473 sq. ft. Tubes: Matl. - 5% Chrome 1/2 moly. O.D. In. - 0.750 Pitch - Square-1"
E-6 A & B	3x4	Heat Exchanger Crude/Resid Type: BEU Code: ASME Sec. VIII, Div. 1, latest edition Size: 27 x 240 Surface Each: 1914 sq. ft. Tubes: Matl. - 5% Chrome 1/2 Moly O.D. In. - 0.750 Pitch - Square - 1"
E-7 A & B	3x4	Heat Exchanger Water/Salt Water Type: Multi-tube Code: ASME Sec. VIII, Div. 1, latest edition Size: 8 x 300 Surface Each: 412 sq. ft. Tubes: Matl - C.S.

5. PUMPS

ITEM	QTY	DESCRIPTION
P-1 A&B	3x4	Crude Charge Pump Horizontal 3 x 15A single stage centrifugal pump with mechanical seal, 200 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor. Installed with piping, wiring, and start/stop station complete on crude charge pump skid. One operating, one spare.



ITEM	QTY	DESCRIPTION
P-2 A&B	3x4	Residue Pump Vertical inline 1-1/2 x 8W single stage centrifugal pump, with mechanical seal, 15 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor, mechanical seal. Installed with piping, wiring and start/stop station. One operating, one spare.
P-3 A&B	3x4	Atmospheric Gas-Oil Pump Vertical inline 1 x 8WL single stage centrifugal pump with integral seal flush, 10 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor, mechanical seal. Installed with piping, wiring and start/stop station. One operating, one spare.
P-4 A&B	3x4	Diesel Pump Vertical inline 2 x 8WL single stage centrifugal pump with mechanical seal 20 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor, mechanical seal. Installed with piping, wiring and start/stop station. One operating, one spare.
P-5 A&B	3x4	Kerosene Pump Vertical inline 1-1/2 x 7WL single stage centrifugal pump, 7.5 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor, mechanical seal. Installed with piping, wiring, and start/stop station. One operating, one spare.
P-6 A&B	3x4	Heavy Naphtha Pump Vertical inline 1-1/2 x 8WL single stage centrifugal pump, 15 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor, mechanical seal. Installed with piping, wiring, and start/stop station. One operating, one spare.
P-7 A&B	3x4	Reflux Pump Vertical inline 3x8W single stage centrifugal pump, 30 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor, mechanical seal. Installed with piping, wiring, and start/stop station. One operating, one spare.
P-8 A&B	3x4	Desalter Water Pump P2BBF single stage centrifugal pump, 20 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor, installed with piping, wiring and start/stop station. One operating, one spare.
P-9 A&B	3x4	Caustic Transfer Pump Vertical inline 2 x 1-1/2 x 6 VOC single stage centrifugal pump, mechanical seal, 1.5 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor. Installed with piping, wiring and start/stop station. One operating, one spare.
P-10 A&B	3x4	Caustic Charge Pump Metering pump with ball checks in suction and discharge. Stroke adjustment by micrometer screw while pump is running. Wetted parts are 316 S.S.
P-11 A&B	3x4	Caustic Circulation Pump Vertical inline 2 x 1 1/2x6 VOC centrifugal pump, mechanical seal, 2 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor. Installed with piping, wiring and start/stop station. One operating, one spare.
P-12 A&B	3x4	Softened Water Pump Vertical inline 2 x 1-1/2x6 VOC centrifugal pump, mechanical seal, 1.5 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor. Installed with piping, wiring and start/stop station. One operating, one spare.
P-13 A&B	3x4	Boiler Feedwater Pump Centrifugal pump, mechanical seal, 5 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor for primary dryer. Installed with piping, wiring and start/stop station. One operating, one spare.



ITEM	QTY	DESCRIPTION
P-15 A&B	3x4	Desalter Water Booster Pumps Vertical inline 1 x 7W centrifugal pump, 7-1/2 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor, installed with piping, wiring and start/stop station. One operating, one spare.
P-16 A&B	3x4	Fuel Oil Pump Centrifugal pump, mechanical seal, 5 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor. Installed with piping, wiring and start/stop station. One operating, one spare.
P-17 A,B,C	3x6	Chemical Injection Pump Metering pump with ball checks in suction and discharge, stroke adjustment by micrometer screw while pump is running. Valve housing and reagent head 316 S.S., valve and seat material 316 S.S.
P-18 A&B	3x4	Caustic Circ. Pump Vertical inline 2 x 1-1/2x6 VOC, mechanical seal, 2 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor. Installed with piping, wiring, and start/stop station. One operating, one spare.
P-20	3x2	Condensate Pump Vertical inline 2x1-1/2x6 VOC, mechanical seal, 3 hp TEFC, 460 volt, 3 phase, 60 cycle, electric motor. Installed w/ piping, wiring & start/stop station
P-22	3x2	Caustic Pump 3x1-1/2x8 VOC vertical inline mechanical seal, 10 hp TEFC, 460 volt, 3 phase, 60 cycle, electric motor. Installed with piping, wiring, and start/stop station. One operating, one spare.
P-23, P-24	3x4	Prewash Pumps Vertical inline 2x1-1/2x6 VOC, mechanical seal, 1-1/2 hp, TEFC, 460 volt, 3 phase, 60 cycle electric motor. Installed with piping, wiring and start/stop station. One operating, one spare.
P-25	3x2	Sump Pump Vertical 1-1/2x1x6 ESP, mechanical seal, 3 hp TEFC, 460 volt, 3 phase, 60 cycle electric motor. Installed with piping, wiring and start/stop station.
P-26	3x2	Sump Pump Vertical 1-1/2x1x6 ESP, mechanical seal, 1-1/2 hp TEFC, 460 volt, 3 phase, 60 cycle, electric motor. Installed with piping, wiring and start/stop station.
P-27	3x2	Sump Pump Vertical 6x4x10 ESP, mechanical seal, 15 hp TEFC, 460 volt, 3 phase, 60 cycle, electric motor. Installed with piping, wiring and start/stop station.

6. ATTENDENT PROCESS EQUIPMENT

ITEM	QTY	DESCRIPTION
D-101A/B	3x4	Desalters
D-6	3x2	Caustic Settler Vessel
D-7	3x2	Water Wash Treater



ITEM	QTY	DESCRIPTION
S-1	3x2	Monarch Oil/Water separator
T-6	3x2	Reactor Mixer Vessel
T-8	3x2	Clay Filter
TK-1	3x2	Desalter Water Storage
TK-11	3x2	Fuel Oil Storage Tank
TK-4	3x2	Catalyst Mixing Tank
V-5	3x2	Fuel Gas Caustic Scrubber
-	-	Pipe racks and piping

7. MAJOR EQUIPMENT LIST

ITEM	QTY	DESCRIPTION
H-1B	3x2	Crude Oil Heater Duty: 48 MM BTU/HR Passes: 2 Tubes: 4" & 6" 42 C.S. (Convection) 4" 50 SCR 1/2 MO (Radiant) 6" 8 - 3" C.S. Finned Steam Coil Burners: JOHN ZINK FFC-Q-45 Comb. Oil & Gas
AC-1 C,D	3x4	Air Coolers - Overhead Condenser Surface: 3093 Sq. Ft. Bare Tubes: C.S. w/Alum. Fins Fans: 4 - 30 hp TEFC Fiberglass Blades Adj. Pitch Vib. Switches
AC-2 B	3x2	Air Cooler - Products Cooler Surface: AGO - 85 Sq. Ft. bare Diesel - 801 Sq. Ft. bare Kero - 412 Sq. Ft. bare Tubes: C.S. w/Alum. Fins Fans: 2 - 15 hp TEFC Adj. Pitch Vib. Switches



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ITEM	QTY	DESCRIPTION
SB-3	3x2	Boiler Scotch Marine Firetube 300 hp 10,000 #/hr steam @ 140 psig ASME Code F.I.A. Controls
E-1 C&D	3x4	Heat Exchangers - Crude/ Heavy Naphtha Type: BEU Size: 21 x 228 Surface: 978 Sq. Ft. Each Tubes: Mat'l C.S. O.D. In - 0.750 BWG - 14 Pitch - Square 1" Design Pressure: Shell - 245 psig @ 200F Tube - 110 psig @ 400F
E-2 C&D	3x4	Heat Exchangers - Crude/Kerosene Type: BEU Size: 15 x 228 Surface: 425 Sq. Ft. Each Tubes: Mat'l C.S. O.D. In - 0.750 BWG - 14 Pitch - Square 1" Design Pressure: Shell - 245 psig @ 300F Tube - 75 psig @ 300F
E-3 C&D	3x4	Heat Exchangers - Crude/AGO Type: BEU Size: 15 x 228 Surface: 395 Sq. Ft. Each Tubes: Mat'l 5% Cr, 1/2% MO O.D. In - 0.750 BWG - 14 Pitch - Square 1" Design Pressure: Shell - 245 psig @ 350F Tube - 75 psig @ 675F
E-4 C&D	3x4	Heat Exchangers - Crude/Resid Type: BEU Size: 29 x 240 Surface: 2258 Sq. Ft. Each Tubes: Mat'l C.S. O.D. In - 0.750 BWG - 14 Pitch - Square 1" Design Pressure: Shell - 75 psig @ 500F Tube - 245 psig @ 300F



ITEM	QTY	DESCRIPTION
E-5 C&D	3x6	Heat Exchangers - Crude/Diesel Type: BEU Size: 25 x 228 Surface: 1473 Sq. Ft. Each Tubes: Mat 1 5% Cr, 1/2% MO O.D. In - 0.750 BWG - 14 Pitch - Square 1" Design Pressure: Shell - 245 psig @ 500F Tube - 100 psig @ 600F
E-6 C&D	3x4	Heat Exchangers - Crude/Resid Type: BEU Size: 27 x 240 Surface: 1914 Sq. Ft. Each Tubes: Mat 1 5% Cr, 1/2% MO — 237 Tubes each O.D. In - 0.750 Pitch - Square 1" Design Pressure: Shell - 75 psig @ 700F Tube - 245 psig @ 700F

8. PUMPS

ITEM	QTY	DESCRIPTION
P-1 C	3x2	Crude Change Pump Type: I-R 3 x 15 A Horizontal-end Suct./Top Disch. Stages: 1 Cap @ Normal: 442 GPM Diff. Hd.: 810 Ft. Driver: 200 hp TEFC 3600 RPM 480/3/60
P-2 C	3x2	Resid Pump Type: I-R 1 1/2 x 8W Vertical Inline Stages: 1 Cap Normal: 172 GPM Diff. Hd.: 217 Ft. Driver: 15 hp TEFC 3600 RPM 480/3/60
P-3 C	3x2	AGO Pump Type: I-R 1 x 8WL Vertical Inline Cap @ Normal: 65 GPM Diff. Hd.: 2.30 Ft. Driver: 10 hp TEFC 3600 RPM 480/3/60
P-4 C	3x2	Diesel Pump Type: I-R 2 x 8WL Vertical Inline Cap @ Normal: 269 GPM Diff. Hd.: 223 Ft. Driver: 20 hp TEFC 3600 RPM 480/3/60



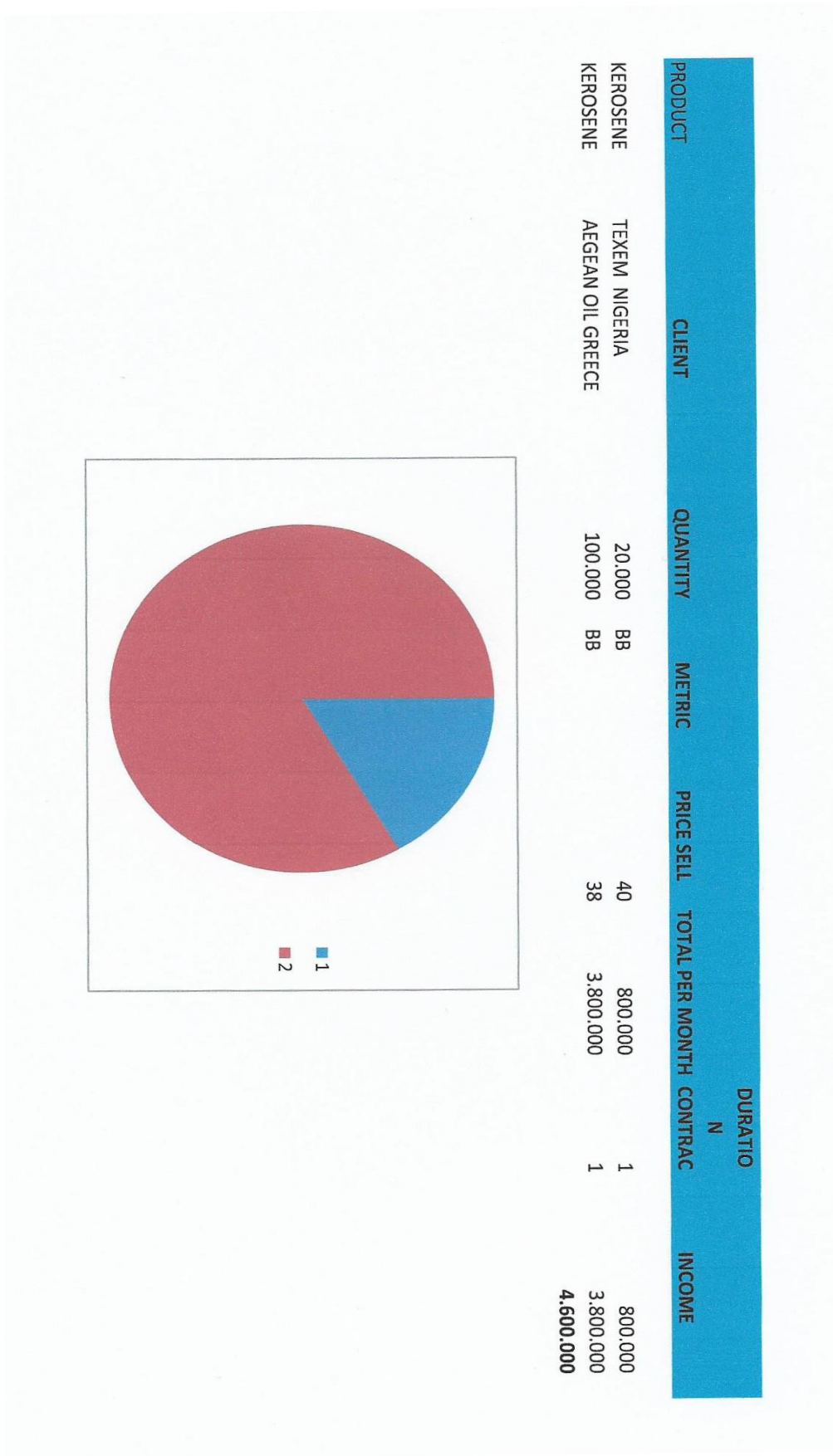
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ITEM	QTY	DESCRIPTION
P-5 C	3x2	Crude Change Pump Type: I-R 1 1/2 x 7 WL Vertical Inline Cap. @ Normal: 96 GPM Diff. Hd.: 171 Ft. Driver: 7.5 hp TEFC 3600 RPM 480/3/60
P-6 C	3x2	Heavy Naphtha Pump Type: I-R 1 1/2 x 8 W Vertical Inline Cap. @ Normal: 141 GPM Diff. Hd.: 225 Ft. Driver: 15 hp TEFC 3600 RPM 480/3/60
P-7 C	3x2	Crude Change Pump Type: I-R 3 x 8 W Vertical Inline Cap. @ Normal: 300 GPM Diff. Hd.: 259 Ft. Driver: 30 hp TEFC 3600 RPM 480/3/60





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TOTAL INCOME MONTH	74.400.000	7.830.000	4.600.000	86.830.000
COST CRUDE OIL + TRANSPORT+LOGISTIC				77.400.000
DIFFERENTIAL				9.430.000
DIFFERENTIAL YEAR				113.160.000
ASFALT	60.000 MT year	220 USD/MT		13.200.000
BENEFIT YEAR				126.360.000



DIDIDOM LTD.

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