

# 100k BPD CO REFINERY



## PROJECT PRESENTATION EXECUTIVE SUMMARY

# 100k BPD CO REFINERY

1. Refinery Configuration
  - Overview
  - Refinery Capacity & Products
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  - Unit Details
  - Flow Block Diagram
  - Suggested Crude Oils' Yield Analysis
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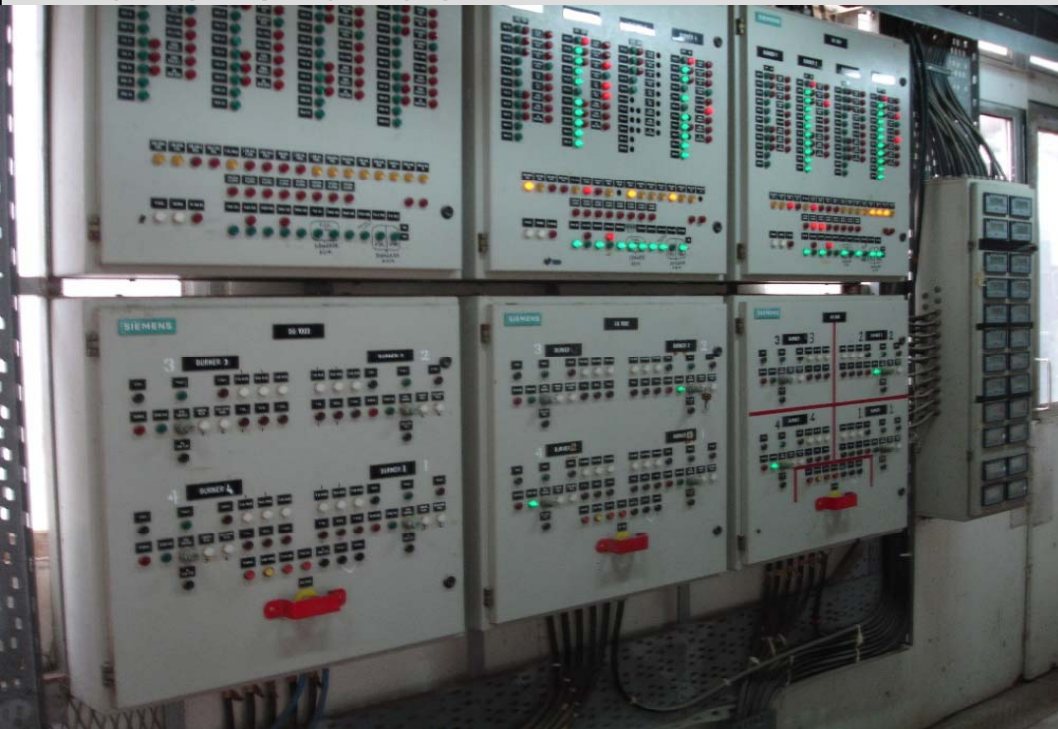


# OVERVIEW

- The refinery has been in operation until 2004
- Proper shut-down procedures have been implemented (de-commissioned by Foster Wheeler)
- Detailed equipment and process documentation have been properly maintained and preserved after shut-down



- Detailed process simulation is being executed - crude oil suitability per customer request



# OVERVIEW

The specific 100k bpd crude oil refining facility as briefly described in the following pages offers a unique opportunity to investors seeking either to recreate the previous facility as it was in successful operation under BP or use the equipment to satisfy the expansion needs of other existing refineries.

The successful implementation of any such scheme is guaranteed by the following:

- Very well preserved equipment condition.
- Complete refinery 3-D model with an accuracy of +/- 5mm as it was in operation (all piping above 2" included).
- All equipment, production, inspection and maintenance documentation (manuals, drawings, reports etc) of the refinery, the "Dataroom", is salvaged, retrieved, reviewed, scanned and filed in cabinets as it originally was in the refinery during operation.
- The dismantling process was carried out by internationally acknowledged specializing companies, supervised continuously by BP, Owner's Engineer and Third Parties.
- The companies and personnel employed by BP during the past 20 years for maintenance, revamps etc were involved in the dismantling, will execute the refurbishment and are available for the erection, piping and other works at the new location. Their experience on the specific equipment is deemed valuable.
- Owner's Engineer has closely followed all tasks while initiating a process simulation model that can be tailored to client's needs in terms of feedstock, targeted market and product pool. The simulation so far has proven that with the addition of an FCC unit (already reserved by owner) and a coker unit the current configuration can produce high added value products.

## REFINERY CONFIGURATION

# REFINERY CAPACITY AND PRODUCTS

## REFINERY PRODUCTION RECORD (1998 -2002)

In '000 Metric Tons

PRODUCT	1998	1999	2000	2001	2002
LPG	83.1	76.1	73.7	68.5	72.6
Premium Gasoline	150.8	168.5	116.9	135.3	184.7
Regular Gasoline	299.1	317.7	217.1	164.8	83.9
Unleaded Gasoline	58.9	47.0	78.3	127.2	139.0
Jet A-1	0.0	0.0	0.0	0.0	0.0
Kerosene	8.0	7.5	6.9	3.2	3.9
All Purpose Diesel	1,101.3	1,330.7	1,019.1	997.6	918.4
Home Heating Oil	117.7	150.4	157.8	109.6	72.0
No. 6 Fuel Oil	1,550.0	1,499.5	1,190.2	1,372.1	1186.0
Flaked Sulphure	3.0	1.9	2.0	2.9	3.2
Naphta	0.0	0.0	0.0	28.0	38.1
<b>Total Saleable</b>	<b>3,371.8</b>	<b>3,599.2</b>	<b>2,862.0</b>	<b>3,009.1</b>	<b>2703.7</b>
Unfinished Product	-5.3	10.4	-8.6	-19.4	7.5

REFINERY CONFIGURATION

# CRUDE OIL THROUGHPUT (in '000 Metric Tons)

CRUDE TYPE	1998	1999	2000	2001	2002
INDIGENOUS MIX	508.0	522.0	536.8	325.6	511.5
FOROZAN	78.6	76.1	0.0	70.8	0.0
KERKUK	0.0	409.7	1050.9	404.1	255.8
E.SIDER	78.7	0.0	75.0	5.6	0.0
IRANIAN HEAVY	223.2	252.3	94.0	1.4	0.0
URALS	325.6	1478.3	222.8	624.8	0.6
SYRIAN LIGHT	297.3	105.7	404.9	526.2	494.9
SAHA RAN	77.7	62.1	19.2	79.6	0.0
SYRIAN BLEND	760.4	208.0	363.2	864.8	840.9
IRAN.UGHT	51.6	9.4	0.0	0.0	0.0
BASRA LIGHT	138.4	70.9	84.4	158.0	0.0
SIBERIAN LIGHT	66.6	261.6	97.4	3.7	0.0
DIDON	0.0	44.0	0.0	0.0	0.0
ARABIAN LIGHT	117.8	0.0	0.0	0.0	0.0
ARABIAN HEAVY	102.1	0.0	0.0	0.0	0.0
ARABIAN MEDIUM	79.4	0.0	0.0	0.0	0.0
MAYA	77.4	0.0	0.0	0.0	0.0
RAS GHARIP	148.4	74.4	0.0	0.0	0.0
BRENT	3.3	0.0	0.0	0.0	0.0
TENGIZ	352.0	149.5	0.0	0.0	7.3
ZUE	0.0	0.0	0.0	36.2	0.0
BUSACHI	0.0	0.0	0.0	0.0	15.1
TEMPA ROSSA	0.0	0.0	0.0	0.0	80.4
WEST DESERT	0.0	0.0	0.0	0.0	102.5
RHEMURA	0.0	0.0	0.0	0.0	65.2
VAL D'AGRI	0.0	0.0	0.0	0.0	423.0
<b>Total Crude Input</b>	<b>3486.3</b>	<b>3724.1</b>	<b>2948.7</b>	<b>3100.9</b>	<b>2797.2</b>
Import H.F.O.	0.0	0.0	11.6	0.0	19.5
Import ISOM	0.0	0.0	0.0	0.0	3.2
Addtives	0.5	0.5	0.3	0.4	0.4
<b>Total Input</b>	<b>3486.8</b>	<b>3724.5</b>	<b>2960.6</b>	<b>3101.2</b>	<b>2820.2</b>
Gravity, API	33.2	33.2	32.8	31.0	33.0

## REFINERY CONFIGURATION

## UNIT DETAILS

UNITS	CAPACITIES BPSD	LICENCOR	DESIGNER/CONST	YEAR
CDU (Crude)	100,000	Socony Mobil Oil	Foster Wheeler	1962
NCHD (Naphta)	24,000	Socony Mobil Oil	Foster Wheeler	1962
Platinum Reformer (PtR)	14,000	Socony Mobil Oil	Foster Wheeler	1962
KCHD (Kerosene)	12,000	Socony Mobil Oil	Foster Wheeler	1962
LPG	4,000	Socony Mobil Oil	Lummus	1980
SRU (Sulphur)	20 Tons/day	Snamprogetti	Snamprogetti	1995
AMU (Amine)	18,500 m <sup>3</sup> /h	Snamprogetti	Snamprogetti	1995
FCC	17,000	UOP	Foster Wheeler	1985

## REFINERY CONFIGURATION

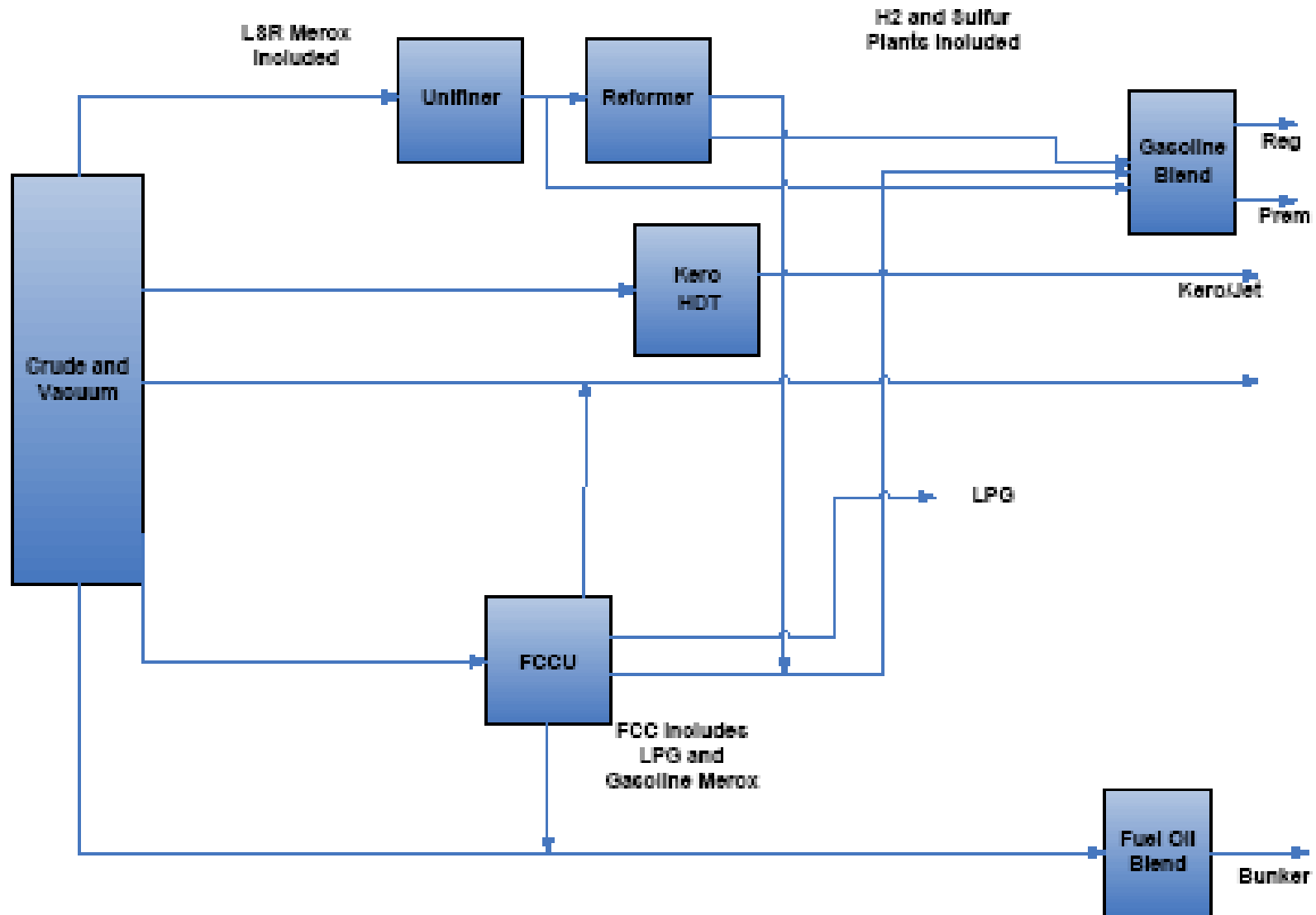




# PROPOSED FACILITY FLOW CHART

(FCCU and Vacuum provided from other sites)

Figure 1. Overall Configuration Diagram



REFINERY CONFIGURATION

## Existing facility – Suggested Crude Oils’ Yield Analysis (bpsd)

Crude oil	Escravos-Cabinda	Palanca-Nemba	Ural	Arab Medium	Bonny Light	Karakuduc	Uzen-Kulsary
Details	API 34.4 S 0.15%	API 39.0 S 0.18%	API 31.8 S 1.35%	API 31.0 S 2.37%	API 34.5 S 0.14%	API 40.2 S 0.04%	API 31.2 S 0.55%
Feed capacity	100,000	95,000	100,000	100,000	100,000	95,000	100,000
Propane	2,180	2,280	2,030	1,950	2,200	2,280	2,120
Kerosene	3,750	3,450	4,050	3,900	3,950	3,850	3,850
Regular gasoline	15,030	14,770	15,620	15,220	15,100	14,750	15,230
Diesel	33,240	31,910	33,320	32,520	33,190	32,250	32,850
Fuel Oil	43,050	40,620	42,570	43,770	42,890	39,950	43,250
SULPHUR T/D max	20	20	20	20	20	20	20

**Existing facility +FCCU+VDU :**  
**Suggested Crude Oils' Yield Analysis (bpsd)**

<b>Crude oil</b>	<b>Escravos-Cabinda</b>	<b>Palanca-Nemba</b>	<b>Ural</b>	<b>Arab Medium</b>	<b>Bonny Light</b>	<b>Karakuduc</b>	<b>Uzen-Kulsary</b>
Details	API 34.4 S 0.15%	API 39.0 S 0.18%	API 31.8 S 1.35%	API 31.0 S 2.37%	API 34.5 S 0.14%	API 40.2 S 0.04%	API 31.2 S 0.55%
Feed capacity	100,000	95,000	100,000	100,000	100,000	95,000	100,000
Propane	2,180	2,280	2,130	1,950	2,200	2,280	2,120
Kerosene	4,150	3,900	4,050	3,900	4,200	4,100	3,850
Regular gasoline	23,030	21,770	21,620	21,920	23,100	21,750	22,230
Diesel	33,540	33,910	34,320	33,960	34,190	32,950	33,850
Fuel Oil	35,050	31,620	34,970	35,470	33,890	31,750	34,950
SULPHUR T/D max	20	20	20	20	20	20	20

## Existing facility – Suggested Crude Oils' Yield Analysis (bpsd)

Crude oil	Upper Zukum	Ural	Arab Medium	Khursaniyah Abu Saf
Details	API 34. S= 1,89%	API 31.8 S =1,35%	API 31.0 S= 2,37%	API 28.5 S= 2,85%
Feed capacity	100,000	100,000	100,000	100,000
LPG	2,000	2,000	1.900	550
Kerosene	7, 100	7,100	6.900	6,300
Regular gasoline	22,100	21,600	20,200	20,650
Diesel	22,200	22,300	21,500	20,900
Fuel Oil	43,800	44,200	46,700	48,800
SULPHUR T/D max	20	20	20	20

**Existing facility +FCCU+VDU:  
Suggested Crude Oils' Yield Analysis (bpsd)**

<b>Crude oil</b>	<b>Upper Zukum</b>	<b>Ural</b>	<b>Arab Medium</b>	<b>Khursaniyah Abu Saf</b>
Details	API 34. S= 1,89%	API 31.8 S =1,35%	API 31.0 S= 2,37%	API 28.5 S= 2,85%
Feed capacity	100,000	100,000	100,000	100,000
LPG	2,000	2,000	1.900	550
Kerosene	7, 100	7,100	6.900	6,300
Regular gasoline	29,100	28,600	27,200	27,650
Diesel	23,200	23,300	22,500	21,900
Fuel Oil	35,800	36,200	38,700	40,800
SULPHUR T/D max	20	20	20	20



# PHASE 1 – Data Room & Documentation

## 1. Data Room

Owner's Engineer upon Owner's order, established a local, on site team consisting of experienced engineers some of them being former senior engineers and managers of the specific refinery, to retrieve, assemble, review, evaluate and finally re-create the refinery's initial data room by going through all available on site documentation, including:

- All available equipment documentation such as operating manuals, drawings, maintenance records, inspection log books etc.



## PHASE 1 – Data Room & Documentation

- All available production documentation such as production planning sheets and log books, feedstock records etc.

After the initial data room was re-created, filed and tagged as per industry standards to create an actual library, the whole “room” was uploaded on a electronic data base accessible via internet.

The on site task had been executed successfully from Sep.08 to Mar.09 by the corresponding team. Currently all documentation is filed and tagged in relevant cabinets while the uploading of the electronic database is completed.





# PHASE 1 – Data Room & Documentation

## 2. Site Verification and 3-D Laser Scanning

Owner's Engineer upon Owner's order, executed a detailed survey of the complete facility before dismantling commencement. The task consisted of two main parts:

a. the field work (measurements) and

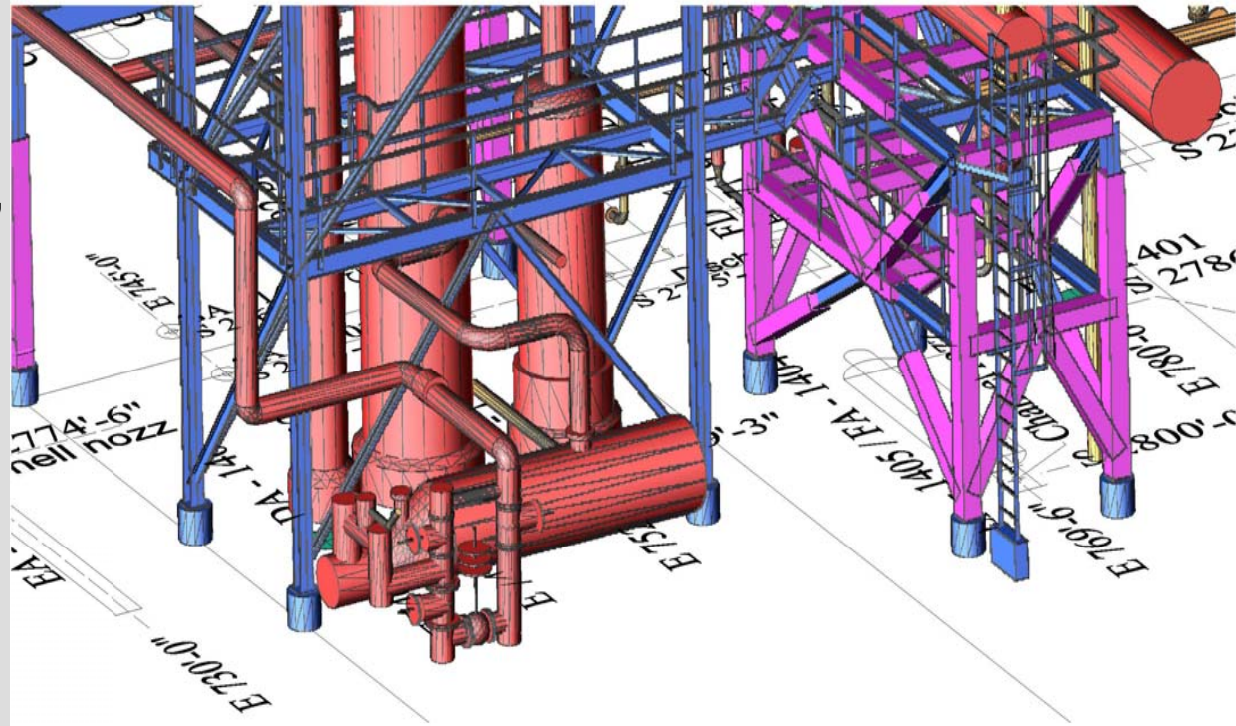
b. the 3D intelligent modeling and relevant design, utilizing specialized CYCLONE and AVEVA Plant software. The field job utilized the latest technology LEICA 3D laser scanning equipment and included the following:

- Verification and marking of all equipment as depicted in existing P&IDs. The team was

assisted by the Third Parties that were hired to certify the verification process executed by the team.

- Laser scanning of all installed units, piping and all relevant utilities in the "as is" condition prior to dismantling.

- VIDEO recording of all Units and surrounding area to facilitate as additional data during the various design stages.





# DELIVERABLES

## 1. Refurbished Refinery Equipment

- The complete list of the refinery equipment is currently stored at Famagusta port, Cyprus, in a secure, private free zone storage facility.
- No refurbishment activity has commenced

## 2. FCCU

- Unit identified by Owner and reserved for incorporation in the existing 100k bpd refinery facility. The production will be greatly enhanced towards high added value products.
- The unit is being incorporated in the process design along with the current facility.
- The unit is currently stored at Owner's contractor facilities. No refurbishment activity has commenced.





# DELIVERABLES

3. Vacuum Unit  
Specific unit has already been identified in order to be incorporated in the existing facility.
4. Other Units – Utilities  
Owner has identified and reserved various equipment in different sites available upon customer request to assist in concluding an upgraded refinery production.
5. Data Room
  - Complete, easy access, internet based Data Room including all available and useful documentation from previous operation and all data generated during refurbishment period (i.e. inspection reports, Release Notes, 3-D facility model, P&I drawings etc)
  - Process detailed simulation model by KBC, based on suggested feedstocks. Additional simulation reports on alternative crudes upon request. Also all relevant reports that derive from the executed runs and will support further process design or expansion plans.

*The certified quality level of the work executed, the specific project team structure and the relatively well preserved condition of the available equipment guarantee a successful result.*

# 100k BPD CO REFINERY





# PRE-DISMANTLING PHASE



## SELECTED PHOTO GALLERY



# PRE-DISMANTLING PHASE



SELECTED PHOTO GALLERY

# PRE-DISMANTLING PHASE



SELECTED PHOTO GALLERY



# PRE-DISMANTLING PHASE



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# DISMANTLING & TRANSPORTATION PHASE



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# CURRENT STORAGE



SELECTED PHOTO GALLERY



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