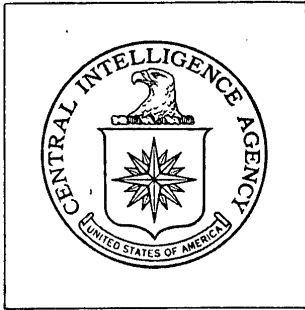


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DIRECTORATE OF
INTELLIGENCE

**Industrial Facilities
(Non-Military)**

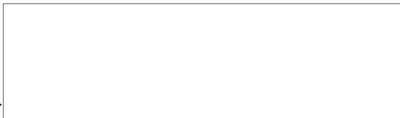
Basic Imagery Interpretation Report

Ryazan Petroleum Refinery

Ryazan, USSR



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CENTRAL INTELLIGENCE AGENCY
 Directorate of Intelligence
 Imagery Analysis Service

| | | |
|---|------------------------|-----------------------------|
| INSTALLATION OR ACTIVITY NAME | | COUNTRY |
| Ryazan Petroleum Refinery | | UR |
| UTM COORDINATES | GEOGRAPHIC COORDINATES | 25X1 |
| 37UEA468483 | 54-34-02N 39-44-39E | |
| MAP REFERENCE | | |
| 15th RTS. USATC, Series 200, Sheet M0166-6HL, 4th ed, Sep 69, Scale 1:200,000 | | |
| (SECRET) 25X1 | | |
| LATEST IMAGERY USED | | NEGATION DATE (If required) |
| [Redacted] | | NA 25X1 |

ABSTRACT

Ryazan Petroleum Refinery is one of the ten largest Soviet refineries with respect to charge capacity. The major production facilities present at the refinery include crude oil distillation units, thermal and catalytic cracking units, a catalytic reforming-hydrotreating unit, catalytic reforming units, a possible hydrorefining unit, probable hydrotreating units, and a gas fractionation unit. Other facilities include a dewaxing unit, a probable deasphalting unit, a probable solvent extraction unit, and a sulfuric acid plant. Two secondary processing units were under construction in May 1971, the date of the latest photography used in this report.

The main products of the refinery are straight-run, cracked, reformed, and blended gasolines. Other products include kerosene, diesel and fuel oils, waxes, petrochemical feedstocks, sulfuric acid, and probably lubricating oils and asphaltic materials.

In May 1962, the date of the earliest photography used in this report, the refinery appeared operational, but no indicators of operation were observed. It has been observed operating on all subsequent coverage from September 1963 through May 1971.

This report includes a detailed line drawing, a photograph of the refinery, a listing of facilities with measurements of storage tanks, and a discussion of the status of facilities.

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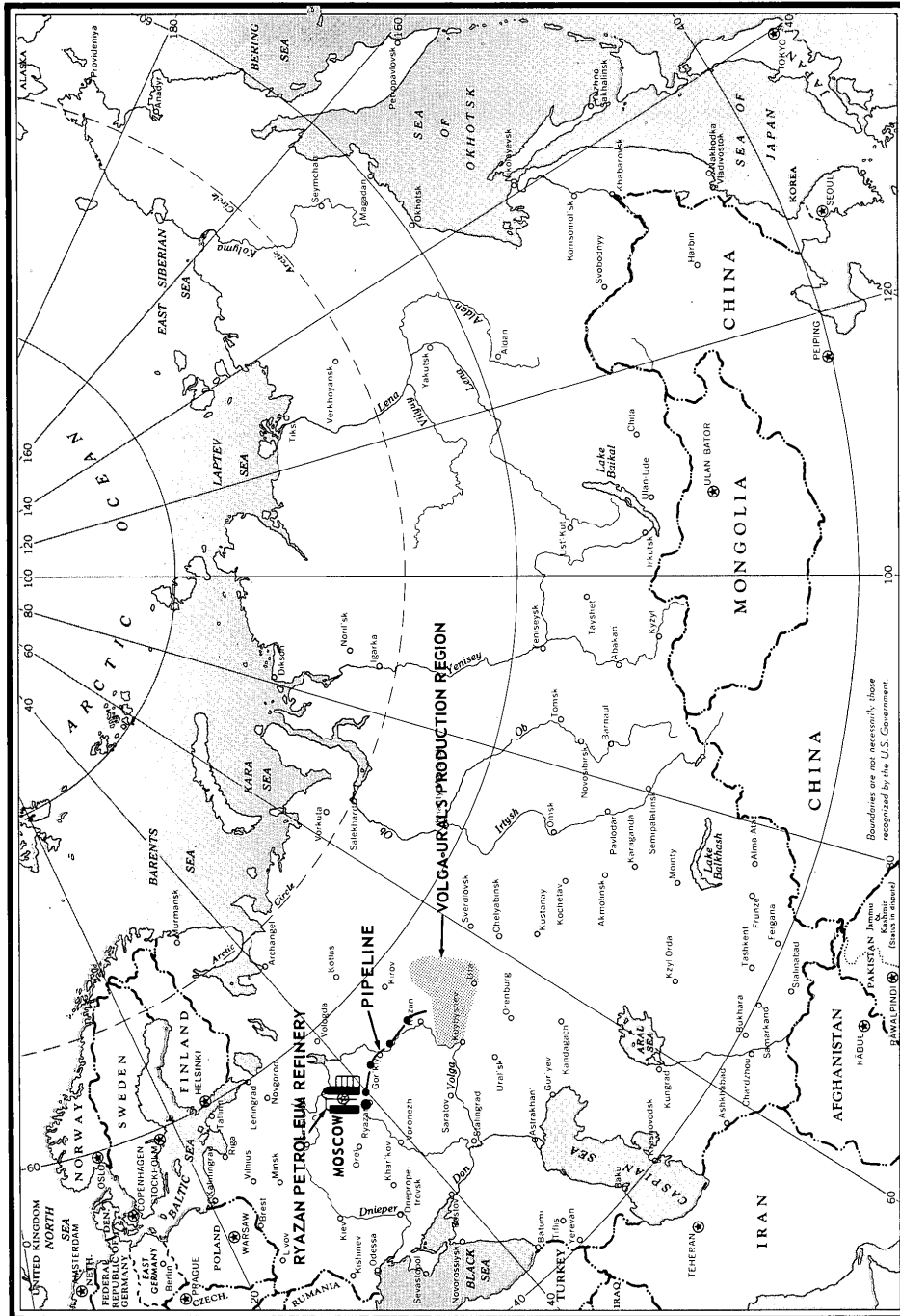


FIGURE 1. LOCATION MAP.

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INTRODUCTION

Ryazan Petroleum Refinery is located on the southern outskirts of Ryazan (see Figure 1). It reportedly began operating in 1962. 1/

The refinery is served by a spur from the main rail line between Ryazan and Michurinsk. Crude oil to charge the refinery comes via pipeline from the Volga-Urals production region. 2/

Electric power and steam for the refinery are produced at the collocated Ryazan Heat and Thermal Power Plant Novoryazan TETS

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BASIC DESCRIPTION

The refinery area measures approximately 10,500 by 5,000 feet and occupies about 1,230 acres (see Figures 2 and 3). It is partially secured by a wall.

Operational Functions

This refinery is one of the ten largest Soviet refineries with respect to charge capacity. The major refining units presently in operation include crude oil distillation units, thermal and catalytic cracking units, a catalytic reforming-hydrotreating unit, a catalytic reforming unit, two probable catalytic reforming units, a possible hydrorefining unit, two probable and one possible hydrotreating units, and a gas fractionation unit. Other facilities include a dewaxing unit, a probable deasphalting unit, a probable solvent extraction unit, and a sulfuric acid plant.

Based on the identification of processing units, the main products of the refinery are straight-run, cracked, reformed, and blended gasolines in a wide range of octane ratings. Other products include kerosene, desulfurized diesel and fuel oils, waxes, petrochemical feedstocks, sulfuric acid, and probably lubricating oils and asphaltic materials.

Construction and Operational Status

Construction has been observed at the refinery on all coverage since May 1962, the date of the earliest photography used in this report. Most of the major units were complete by mid-1968. On the latest coverage in May 1971 a dewaxing unit and an unidentified secondary processing unit were under construction.

The refinery appeared capable of operation in May 1962, but no indicators of operation were observed. It has been observed in operation on all coverage from September 1963 through May 1971.

Figure 4 shows the construction chronology for the individual areas and major units.

Facilities and Equipment

Table 1 lists the functional areas, facilities, and equipment within the refinery. Measurements are given to the nearest half-meter.

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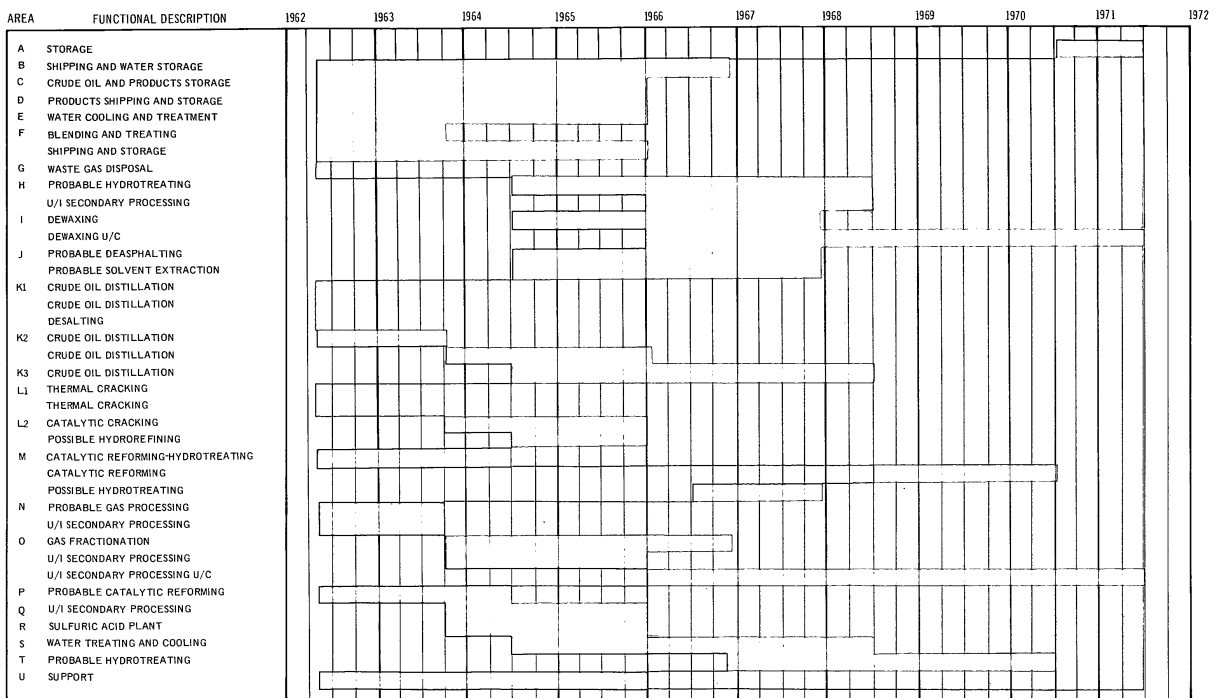


FIGURE 4. CONSTRUCTION CHRONOLOGY, RYAZAN PETROLEUM REFINERY.

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TOP SECRET RUFFTable 1. Equipment and Facilities at the Ryazan Petroleum Refinery
(Keyed to Figure 3)

| <u>Area</u> | <u>Functional Description</u> | <u>Equipment and Facilities</u> |
|-------------|--------------------------------|--|
| A | Storage | 1 Support building 1 Building U/C 16 Cylindrical storage tanks 11 45-meter-diameter 5 33-meter-diameter |
| B | Shipping and Water Storage | 1 Pump building 5 Loading racks 6 Cylindrical storage tanks 2 [redacted] 25X1 4 [redacted] 5 Water storage reservoirs |
| C | Crude Oil and Products Storage | 7 Pump buildings 12 Support buildings 41 Semiburied reservoirs 20 Cylindrical storage tanks 10 21-meter-diameter 7 [redacted] 25X1 3 [redacted] |
| D | Products Shipping and Storage | 3 Pump buildings 1 Shipping building 1 Loading rack 7 Support buildings 74 Cylindrical storage tanks 1 [redacted] 25X1 9 15-meter-diameter 18 [redacted] 25X1 6 12-meter-diameter 4 [redacted] 25X1 14 9-meter-diameter 2 [redacted] 25X1 14 6-meter-diameter 6 [redacted] 25X1 26 Horizontal storage tanks 8 15-meter-long 18 [redacted] 25X1 |
| E | Water Cooling and Treatment | 2 Pump buildings 2 Support buildings 21 Cooling towers 9 with 5 cells each 12 with 3 cells each 15 Support buildings 14 Water treatment basins 2 Water reservoirs |

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| Area | Functional Description | Equipment and Facilities |
|------|--|--|
| F | Blending, Treating, Shipping, and Storage | 1 Blending/treating unit with 5 blending/treating tanks 1 pump building 2 shipping buildings 2 support buildings 1 crane 1 Possible treating/separation unit with 2 clusters of processing equipment 11 possible horizontal separators 2 pump buildings 1 shipping building 2 support buildings 13 cylindrical storage tanks 2 [redacted] 25X1 1 [redacted] 7 [redacted] 3 6-meter-diameter 4 Pump buildings 2 Loading racks 2 Shipping buildings 8 Support buildings 45 Cylindrical tanks 12 [redacted] 25X1 6 9-meter-diameter 12 [redacted] 25X1 2 6-meter-diameter 2 [redacted] 25X1 11 3-meter-diameter 5 Horizontal storage tanks, 15 meters long |
| G | Waste Gas Disposal | 2 Buildings 1 Gasholder, [redacted] 25X1 in diameter |
| H | Probable Hydrotreating and Unidentified Secondary Processing | 1 Probable hydrotreating unit with 3 possible reactors 9 columns 1 bank of heat exchangers/cooling coils/accumulators 3 pipe furnaces 1 pump building 1 Unidentified secondary processing unit with 1 cluster of processing equipment 1 pipe furnace 1 pump/compressor building 4 horizontal tanks/accumulators (not measured) 5 Support buildings 1 Building under construction 62 Cylindrical storage tanks 7 9-meter-diameter 39 [redacted] 25X1 16 6-meter-diameter |

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| Area | Functional Description | Equipment and Facilities |
|------|---|---|
| I | Dewaxing | 1 Unit with 2 solvent regeneration sections, each with 4 columns 2 chiller buildings, each with 4 crystallizer drums and attached bank of processing equipment 1 filter building with 4 hoppers 1 pump/processing building 1 control house 2 horizontal storage tanks (not measured) 1 gasholder, 25X1 in diameter 4 Support buildings 1 Dewaxing unit under construction |
| J | Probable Deasphalting and Probable Solvent Extraction | 1 Probable deasphalting unit with 8 columns 1 pipe furnace 2 processing buildings, each with heaters/horizontal tanks on the roof 2 pump buildings 2 probable propane storage tanks (not measured) 1 Probable solvent extraction unit with 7 columns 1 bank of cooling coils/heat exchangers/accumulators 4 pipe furnaces 1 pump building 2 cylindrical solvent storage tanks 3 horizontal solvent storage tanks 3 Support buildings 39 Cylindrical storage tanks 12 25X1 14 13 6-meter-diameter |
| K | Crude Oil Distillation (1) Crude Oil Distillation | 2 Units, each with 1 atmospheric column 1 vacuum column 5 stabilizer/stripper columns 3 rerun columns 1 bank of heat exchangers/cooling coils/accumulators 2 pipe furnaces 3 heaters 1 treatment building with 7 settling tanks/accumulators 1 processing building 1 pump building 1 control house 4 cylindrical tanks (not measured) |

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| <u>Area</u> | <u>Functional Description</u> | <u>Equipment and Facilities</u> |
|-------------|-------------------------------|---|
| K (Cont) | | <ul style="list-style-type: none"> 1 Desalting unit with <ul style="list-style-type: none"> 2 spherical desalting drums 1 bank of processing equipment 1 pump building 6 horizontal storage tanks, 15 meters long |
| | (2) Crude Oil Distillation | <ul style="list-style-type: none"> 1 Unit with <ul style="list-style-type: none"> 1 atmospheric column 2 vacuum columns 8 other columns 5 banks of heat exchangers/cooling coils/accumulators 2 pipe furnaces 1 processing building with 4 heaters on the roof 1 treatment building with 4 attached accumulators/settling tanks 2 buildings, each with 4 horizontal tanks on the roof 1 pump building 1 support building 4 cylindrical tanks (not measured) 1 Desalting unit with <ul style="list-style-type: none"> 3 spherical desalting drums 1 support building 2 horizontal storage tanks, 12 meters long 1 Unit with <ul style="list-style-type: none"> 1 atmospheric column 2 vacuum columns 4 other columns 3 banks of heat exchangers/cooling coils/accumulators 2 pipe furnaces 1 processing building with 4 heaters on the roof 1 treatment building with 5 attached accumulators/settling tanks 1 probable processing building 2 pump buildings 2 cylindrical tanks (not measured) 1 Desalting unit with <ul style="list-style-type: none"> 3 spherical desalting drums 1 support building 1 horizontal storage tank, 12 meters long |

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| <u>Area</u> | <u>Functional Description</u> | <u>Equipment and Facilities</u> |
|-------------|----------------------------------|--|
| K (Cont) | (3) Crude Oil Distillation | 5 Support buildings 25 Cylindrical storage tanks 2 [redacted] 25X1 17 [redacted] 6 12-meter-diameter 1 Unit with 1 atmospheric column 1 vacuum column 6 other columns 1 bank of processing equipment 2 banks of accumulators/settling tanks 1 bank of heat exchangers/cooling coils/accumulators 2 pipe furnaces 1 possible processing building 2 pump buildings 6 Support buildings 12 Cylindrical storage tanks, [redacted] 25X1 in diameter |
| L | Cracking (1) Thermal Cracking | 2 Units, each with 4 columns (including 1 reactor column, 1 fractionating column and 1 flash chamber) 1 vapor recovery section with 4 columns 1 bank of cooling coils/heat exchangers/accumulators 2 pipe furnaces 1 pump building 2 pump/processing buildings 2 Support buildings 14 Cylindrical storage tanks 8 [redacted] 25X1 6 [redacted] |
| | (2) Catalytic Cracking | 1 Fluid-bed catalytic cracking unit with 1 reactor 1 regenerator 1 fractionating column 1 cluster of processing equipment 1 vapor recovery section with 4 columns and 1 building 1 pipe furnace 3 processing buildings 3 pump buildings 1 control house |

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| <u>Area</u> | <u>Functional Description</u> | <u>Equipment and Facilities</u> |
|-------------|-----------------------------------|--|
| L (Cont) | | 1 support building 6 cylindrical storage tanks (not measured) 1 Possible hydrorefining unit with 3 columns 2 pipe furnaces 1 processing building with a bank of horizontal tanks on the roof |
| M | Catalytic Reforming-Hydrotreating | 1 Unit with 1 catalytic reforming section with 5 reactors 3 columns 1 bank of processing equipment 1 bank of cooling coils/heat exchangers 1 pipe furnace 1 possible pre-heater/precipitator 1 pump building 1 probable hydro-treating section with 4 columns 1 bank of processing equipment 1 bank of cooling coils/heat exchangers 2 pipe furnaces 1 possible pre-heater/precipitator 1 pump building 2 cylindrical storage tanks (not measured) 1 Pump building 4 Cylindrical storage tanks, [redacted] 25X1 in diameter 1 Catalytic reforming unit with 4 probable reactors 4 columns 1 bank of processing equipment 2 banks of cooling coils/heat exchangers/accumulators 1 pipe furnace 2 pump buildings |

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| <u>Area</u> | <u>Functional Description</u> | <u>Equipment and Facilities</u> |
|-------------|---|--|
| M (Cont) | | 1 Possible hydrotreating unit with 2 columns 2 banks of cooling coils/heat exchangers/accumulators 2 pipe furnaces 1 pump building 6 Cylindrical storage tanks, [redacted] 25X1 diameter |
| N | Probable Gas Processing and Unidentified Secondary Processing | 1 Probable gas processing unit with 6 columns 2 compressor buildings 1 support building 1 gas holder [redacted] 25X1 1 Unidentified secondary processing unit with 6 columns 1 bank of cooling coils/heat exchangers/accumulators 1 pipe furnace 4 pump buildings 1 support building 2 storage tanks (not measured) 4 Cylindrical storage tanks, [redacted] 25X1 [redacted] 25X1 |
| O | Gas Fractionation and Unidentified Secondary Processing | 1 Gas fractionating unit with 10 columns 1 bank of cooling coils/heat exchangers/accumulators 3 processing buildings, each with a bank of horizontal tanks on the roof 1 pump building 1 Unidentified secondary processing unit with 4 columns 1 bank of cooling coils/heat exchangers/accumulators 2 processing buildings 2 pump buildings 1 support building 3 Support buildings 20 Horizontal storage tanks 10 21-meter-long [redacted] 25X1 10 [redacted] 1 Unidentified secondary processing unit under construction |

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| <u>Area</u> | <u>Functional Description</u> | <u>Equipment and Facilities</u> |
|-------------|-----------------------------------|--|
| P | Probable Catalytic Reforming | 1 Probable catalytic reforming unit with 4 probable reactors 4 columns 1 bank of processing equipment 2 banks of cooling coils/heat exchangers/accumulators 4 pipe furnaces 1 processing building with 4 attached accumulators/settling tanks 2 pump buildings 4 cylindrical storage tanks, 15 meters in diameter |
| Q | Unidentified Secondary Processing | 1 Unit with 11 columns 1 bank of probable reactors 2 banks of cooling coils/heat exchangers/accumulators 1 pipe furnace 4 pump/processing buildings 2 cylindrical storage tanks (not measured) 4 horizontal tanks (not measured) 9 Cylindrical storage tanks 2 15-meter-diameter 3 25X1 4 |
| R | Sulfuric Acid Plant | Shown on Figure 3 but no detailed listing of equipment given. |
| S | Water Treatment and Cooling | 2 Pump buildings 7 Cooling towers 5 with 3 cells 2 with 2 cells 4 Water basins |
| T | Probable Hydrotreating | 1 Unit with 10 columns 1 bank of processing equipment 4 furnaces 2 pump buildings 6 Cylindrical storage tanks, 15 meters in diameter |
| U | Support | 9 Administration buildings 7 Support buildings 2 Semiburied tanks |

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Map

15th RTS. US Air Target Chart, Series 200, Sheet MQ166-6HL 4th edition
September 1969. Scale 1:200,000 (SECRET)

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Documents

1. Moscow News (English Edition), Union of Soviet Societies for Friendship and Cultural Relations with Foreign Countries, p. 1, 1 December 1962 (UNCLASSIFIED)
2. International Petroleum Encyclopedia, pp. 94-95, 1969 edition, The Petroleum Publishing Co., Tulsa, Oklahoma (UNCLASSIFIED)

Requirement

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