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PHOTOGRAPHIC
INTERPRETATION
REPORT

NATIONAL PHOTOGRAPHIC
INTERPRETATION CENTER

BUKHARA-URALS NATURAL GAS PIPELINE USSR

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BUKHARA-URALS NATURAL GAS PIPELINE, USSR

INTRODUCTION

The compressor stations of the Bukhara-Urals natural gas pipeline were studied on KEYHOLE photography to determine their characteristic features and at what intervals the stations are spaced along the pipeline. Compressor stations, the most prominent components of a natural gas pipeline, are also the most vulnerable because of their size, their isolated location, and the presence of highly volatile natural gas in the above-ground piping and containers at the stations. While the Soviet press has reported on this pipeline, they have not revealed precise locations of facilities, particularly of the compressor stations.

Within the last decade, the Soviet Union has become the world's second largest producer of natural gas with an estimated 41,500 nautical miles (nm) of pipeline planned or in operation. The degree to which this emphasis on exploitation of natural gas resources, including the construction of new pipelines, may be measured from KEYHOLE photography is illustrated in this report.

BUKHARA-URALS PIPELINE

The pipeline selected for this study, known in the USSR as the Bukhara-Urals pipeline, is representative of most Soviet facilities. It extends 1,200 nm between the cities of Bukhara, the source, and Chelyabinsk in the industrial region of the Urals (Figure 1). As observed from photography, the pipeline is served by 16 compressor stations spaced at average intervals of 70 nm. (The names and locations of these stations are given in Table 1.) Completed in 1964, it consists of two parallel 1,020-millimeter-(40-inch-) diameter pipelines between Bukhara and Chelyabinsk and a single pipeline of the same size continuing from Chelyabinsk to Nizhniy Tagil. (The Chelyabinsk-Nizhniy Tagil portion of the line is not covered in this report.) According to Soviet press reports, the pipe was laid [redacted]) from the top of the pipe. In the desert regions, the shifting sands are fixed by sowing local grass and shrubs in the sand strip along the line.

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Compressor Stations

Two types of compressor station are found along this line. In the underdeveloped desert areas the compressors are powered by gas turbine engines. In areas where electricity is plentiful the compressors are driven by electric motors.

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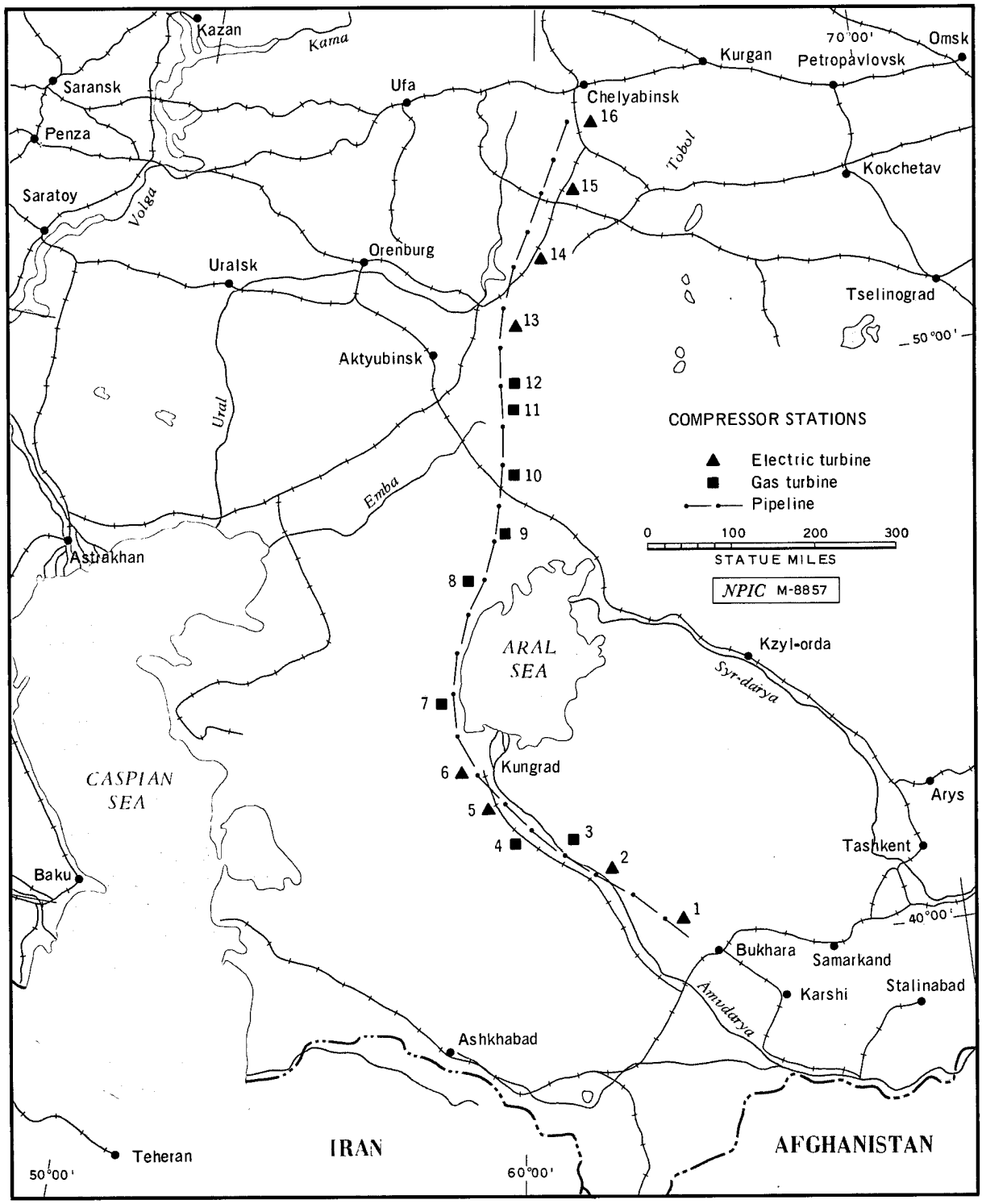

FIGURE 1. BUKHARA-URALS NATURAL GAS PIPELINE, USSR

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Table 1. Compressor Stations along Bukhara-Urals Pipeline (Table is keyed to Figure 1).

Item	Name	Geographic Coordinates	Type
1	Gazli	40-11-00N 063-28-00E	Electric
2	Danisher	41-04-30N 061-52-50E	Electric
3	Uzgarysh	41-22-10N 060-40-20E	Gas turbine
4	Tashauz	41-46-40N 060-01-00E	Gas turbine
5	Khodzheyli	42-23-20N 059-23-00E	Electric
6	Adebiyat	43-02-05N 058-45-45E	Electric
7	Kabanbay	44-00-29N 058-13-37E	Gas turbine
8	Shomyshkol	46-13-17N 058-49-01E	Gas turbine
9	Urdakozgan	47-04-30N 059-04-16E	Gas turbine
10	Solenaya	48-00-10N 059-11-42E	Gas turbine
11	Kaindy	48-54-50N 059-07-35E	Gas turbine
12	Alshimbay	49-55-25N 059-03-40E	Gas turbine
13	Dobbarovka	50-51-25N 059-19-00E	Electric
14	Krasnoyarskiy	51-55-30N 059-54-40E	Electric
15	Kartaly	53-01-00N 060-45-40E	Electric
16	Krasnogorskiy	54-36-20E 061-09-20E	Electric

Note: All coordinates are derived from AMS Series Series 1505 maps, scale 1:250,000.

The gas turbine compressor stations consist of a compressor building, a repair and maintenance building, living quarters, four support buildings, and an underground gas storage tank (Figure 2).

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25X1 The compressor building has ten inlet ducts and ten exhaust stacks in two groups of five each. Two sets of inlet and outlet manifolds connect the compressor buildings to the pipelines, thus, suggesting two separate compressor rooms, each servicing one pipeline. The Soviet press reports that the compressor buildings are constructed of a prefabricated reinforced concrete framework with asbestos/aluminum suspension panels used as wall structures.

The electrically driven compressor stations are similar to the gas turbine stations. However, KH-4 photography reveals that the electrical compressor buildings have inlet ducts but do not have exhaust stacks as do the gas turbine buildings. In addition, the electrically driven compressor stations have a small electrical substation adjacent to the compressor building.

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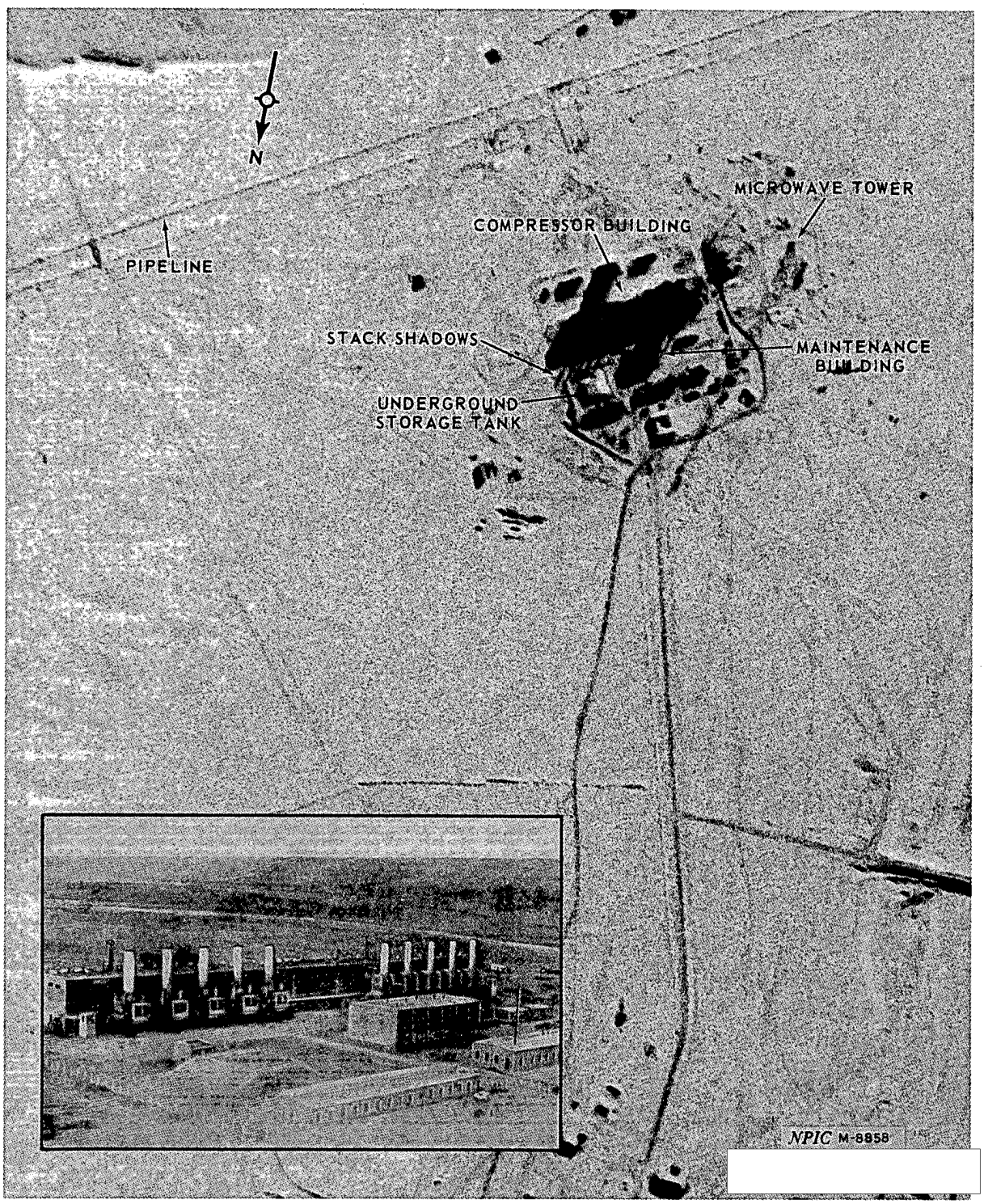

FIGURE 2. TYPICAL GAS TURBINE COMPRESSOR STATIONS. The KEYHOLE photo is of the station at Solenaya; the location of the ground photo was not given.

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Each of the 16 compressor stations has a microwave facility in the immediate vicinity. Microwave stations (usually one, but in some cases as many as three) are also interspersed between compressor stations along the length of the pipeline. This fact lends credence to Soviet reports that the compressor stations are automated and remotely controlled from a central control point.

REFERENCES

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REQUIREMENT

NPIC Project 111108NR

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