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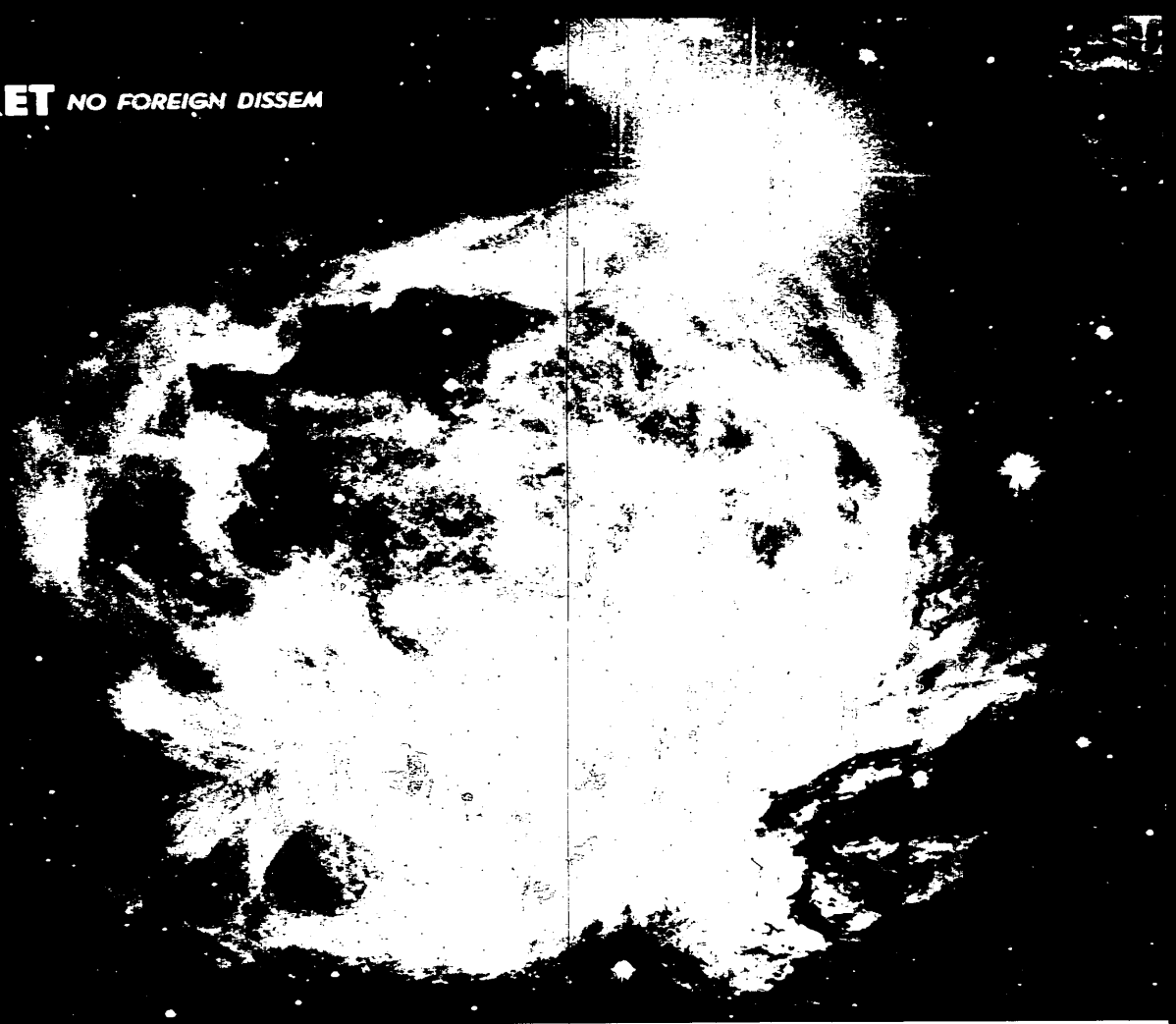

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NEW SOVIET FACILITIES FOR CLOUD PHYSICS RESEARCH

[redacted] 25X1

General Sciences Division
OSI/CIA

The Institute of Applied Geophysics, Academy of Sciences, USSR, is operating facilities for cloud physics research at Obninsk, about 60 miles southwest of Moscow. These were described [redacted] as more impressive than any similar facilities in this country. The cloud physics research, which is under the direction of Dr. L. M. Levin and Dr. I. V. Litvinov, is related directly to the institute's extensive program of field experimentation in weather modification. This program has possible applications to military activities and to such civilian activities as aviation, transportation, and agriculture. The cloud chambers in support of this program represent a large investment of time and money and provide the physical tools for potentially outstanding research on the microphysics of clouds and the behavior of aerosols. 25X1

Since 1960 the institute has operated a meteorological tower 310 meters in height at Obninsk; one purpose of this tower is believed to be monitoring low-level atmospheric conditions in relation to possible radioactive contamination by an atomic electric power plant located nearby. The institute's research in atmospheric diffusion has possible applications to chemical or biological warfare.

To augment the existing research facilities at Obninsk, a new building and a variety of elaborately instrumented cloud chambers recently have been constructed. The largest cloud chamber is about 15 m in diameter and 18 m high, much larger than any cloud chamber presently in use in the United States, and affording the opportunity to more nearly approach the scale of natural clouds. The temperature within this chamber cannot be controlled artificially; however, the Soviets partially overcome this deficiency by operating the chamber at different times of the year to introduce air with different temperatures. The pressure can be controlled over a limited range. The inside of the chamber has three metal balconies around which workers can move and sample clouds. The chamber can be filled with clouds by means of steam jets located at various levels. During a demonstration [redacted] this was done in three stages -- first the top 6 meters were filled with cloud, then the middle 6 meters, and finally the botton 6 meters. Water drops can be introduced at the top of the chamber and allowed to fall and grow by coalescence. 25X1 25X1

To supplement the large chamber there are two other cloud chambers, roughly cylindrical in shape, with

diameters of 3 meters and heights of 16 meters. In these chambers the temperature can be reduced to as low as -40°C and the pressure can be varied from 0.1 to 2 atmospheres. These chambers enable the experimenters to obtain data on formation and dissipation of clouds and fog under conditions approximating various levels in the atmosphere.

A vertical wind tunnel, 2 meters in diameter and 20 meters high, is constructed of stainless steel. The bottom of the tunnel flares outward to accommodate a series of jets so that clouds can be introduced by releasing steam. The air is filtered before being drawn up the vertical tunnel at a flow rate of about 1 m/sec. The vertical tunnel is used primarily to study the mixing and coagulation of aerosols.

There is also a horizontal wind tunnel in which the air speed can be increased to 80 m/sec. As was the case with the vertical tunnel, the air passing through the horizontal tunnel is filtered by both mechanical and electrostatic filters. Water droplets and other aerosols can be introduced into the tunnel and their properties studied. The working section of this tunnel is octagonal in shape and about 1 m in diameter.

Devices for sampling cloud droplets and liquid water content were observed. [redacted] the electrical field could be controlled in one or more of the cloud chambers. 25X1

The primary purpose of the cloud chambers and wind tunnels is to investigate the basic physical processes involved in the formation and dissipation of clouds, fog, and precipitation; the knowledge thus obtained may have significant applications to weather modification. (CONFIDENTIAL)

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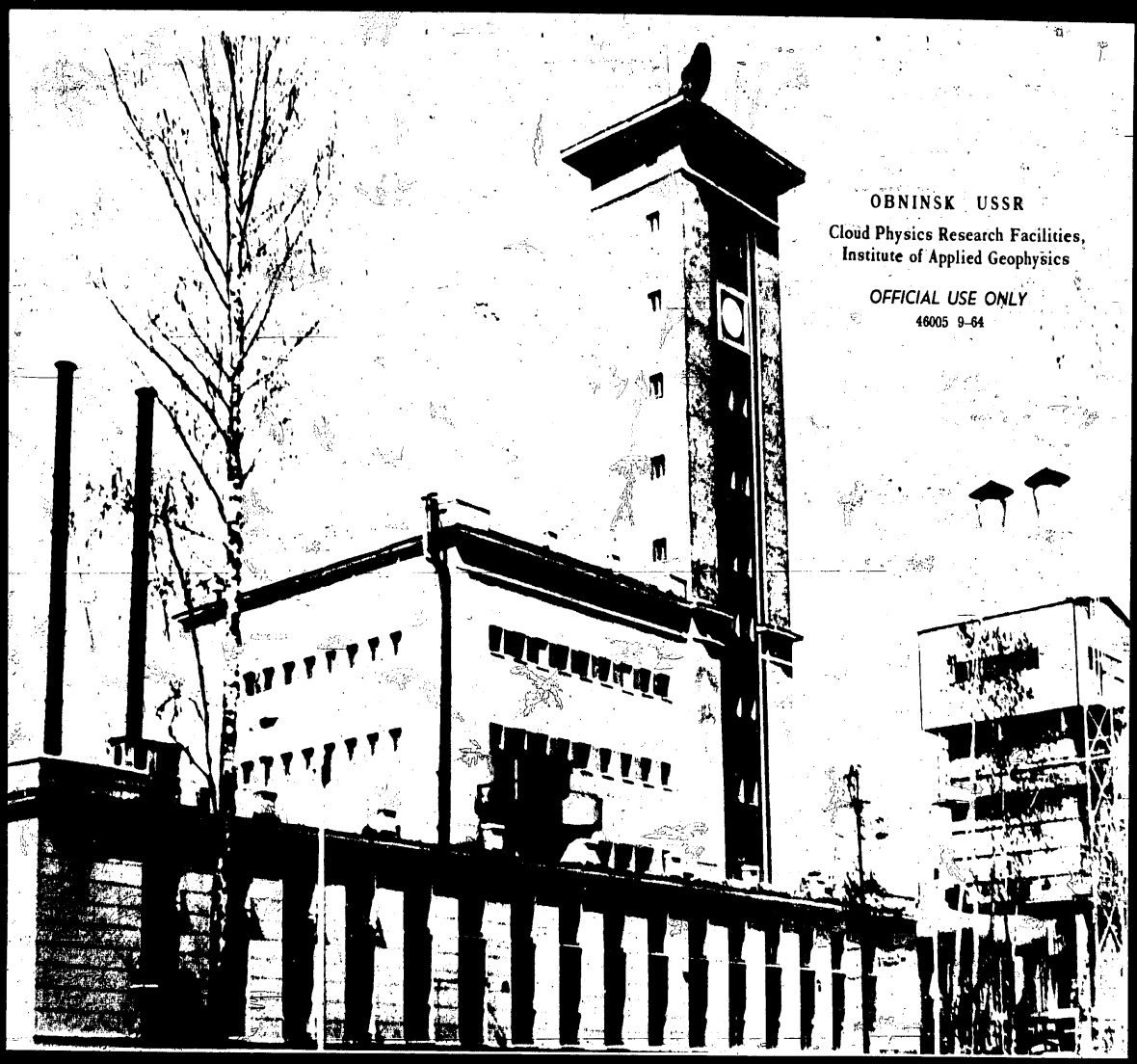

OBNINSK USSR

Cloud Physics Research Facilities,
Institute of Applied Geophysics

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SOVIET VERY SENSITIVE MAGNETOTELLURIC AND TELLURIC STATIONS IDENTIFIED

25X1

General Sciences Division
OSI/CIA

The Soviet Union has 20 known very sensitive magnetotelluric or telluric observatories suitable for nuclear test detection, magnetohydrodynamic (MHD) wave research, or hardened communications experiments, according to a recent study by a well qualified expert. Two of the 20 sensitive stations identified are in the Antarctic; the greatest concentration of stations is in the European USSR. The other stations are scattered thinly along or near the northern, eastern, and southern borders of the USSR where they are useful for detection purposes. (See map.) The Soviet stations in the Antarctic reported detecting the magnetic and telluric effects of the U.S. high-altitude nuclear test of 9 July 1962 in the Pacific.

Previously the number of Soviet magnetotelluric stations having instrumentation sensitive enough for such activities has been estimated at between 16 and 35 by various sources. The larger estimates probably included a number of stations equipped with low sensitivity, observatory-type magnetographs unsuitable for nuclear test detection, MHD research or communications experiments.

To be useful for these functions, the station equipment should have a magnetic field sensitivity of approximately 0.1 gamma and a telluric field sensitivity of 0.1 to 1.0 mv/km in a band from 0.01 to 1.0 cps. Various Soviet statements have indicated that the stations shown on the map have equipment of the required sensitivity. (SECRET)

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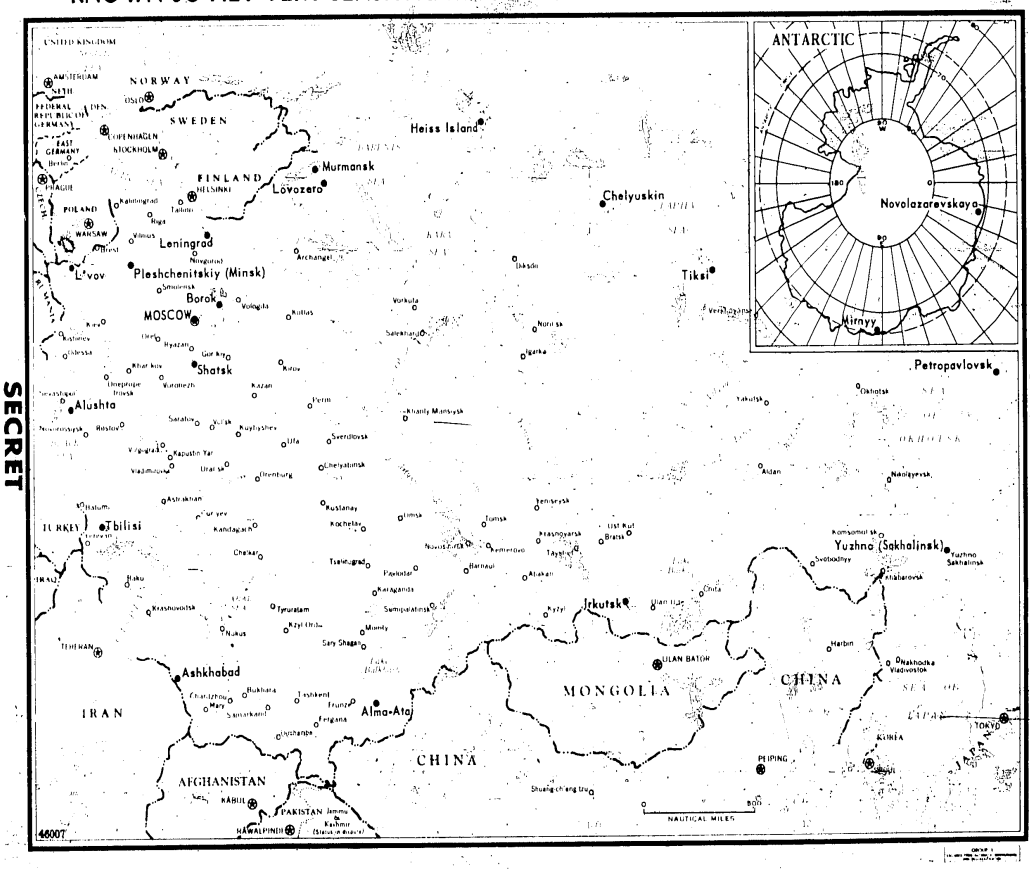
KNOWN SOVIET VERY SENSITIVE MAGNETOTELLURIC AND TELLURIC STATIONS



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