November 1985

Central Intelligence Agency, Directorate of Intelligence, Research Paper, 'Pakistan's Nuclear Weapons Program: Personnel and Organizations'

Citation:

"Central Intelligence Agency, Directorate of Intelligence, Research Paper, 'Pakistan's Nuclear Weapons Program: Personnel and Organizations'", November 1985, Wilson Center Digital Archive, Obtained and contributed by William Burr and included in NPIHP Research Update #11.
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Summary:

This heavily excised report on the "well-educated committed cadre" that managed the Pakistani nuclear program demonstrates how the CIA protects its intelligence on Pakistani nuclear activities. This is the same version of the report that can be found on the Agency's FOIA Web page; the recent version includes no new information. Details on Khan Research Laboratories and the gas centrifuge program are entirely withheld, but some information is made available on the Pakistani Atomic Energy Commission and the Directorate of Nuclear Fuels and Materials. The latter includes details on the status and purpose of major projects, for example, the Kundian Nuclear Complex, also known as the Chasma Reprocessing Plant, which was not completed until 1990. For the purposes of producing plutonium for weapons, the Pakistanis were interested in a heavy water moderated reactor of the NRX (National Research Experimental) type that Canada built at Chalk River. In 1985, the Pakistanis started that project in earnest, with construction beginning in 1987 of what became known as Khushab Chemical Plant II.

Credits:

This document was made possible with support from Carnegie Corporation of New York (CCNY)

Original Language:

English

Contents:

Directorate of Intelligence

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CIANESA 85-10217C

Pakistan's Nuclear Weapons Program: Personnel and Organizations

A Research Paper

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NESA 85-10217C
CR 85-15641C
SW 85-10124C

November 1985

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Pakistan's Nuclear Weapons Program: Personnel and Organizations

A Research Paper

This paper was prepared by Office of Near Eastern and South Asian Analysis; Office of Central Reference; and Office of Scientific and Weapons Research; with a contribution from Office of Imagery Analysis. It was coordinated with the Directorate of Operations.

Comments and queries are welcome and may be directed to the Chief, South Asia Division, NESA, on

Top Secret
NESA 85-10217C
CR 85-15641C
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November 1985

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Pakistan's Nuclear Weapons Program: Personnel and Organizations

Summary

Information available as of 23 September 1985 was used in this report.

Pakistan operates facilities dedicated to nuclear weapons development as well as an extensive civil nuclear establishment. Two administrative entities—the Pakistan Atomic Energy Commission (PAEC) and Khan Research Laboratories (KRL)—oversee the network. The PAEC operates a major nuclear research facility, the Pakistan Institute of Nuclear Science and Technology (PINSTECH), as well as specialized research and nuclear power centers. The Khan Research Laboratories run the gas centrifuge uranium enrichment program.

PAEC and KRL facilities are involved in basic nuclear research and training; design, fabrication, and testing of high explosives and nuclear weapons parts; and uranium mining, processing feed materials, and uranium enrichment. The various facilities are highly compartmented and often work on their individual assignments without a full understanding of the total project or progress.

Senior scientists associated with the weapons effort make up a well-educated, committed cadre. Key personnel include physicists, engineers, and chemists, most of whom received their graduate education and training in the West. With the exception of the Chairman of the PAEC and the Director of KRL, the scientists became associated with the nuclear program in the 1950s and 1960s. Most of Pakistan's second generation of nuclear scientists have been educated in Pakistan with some specialized training abroad.

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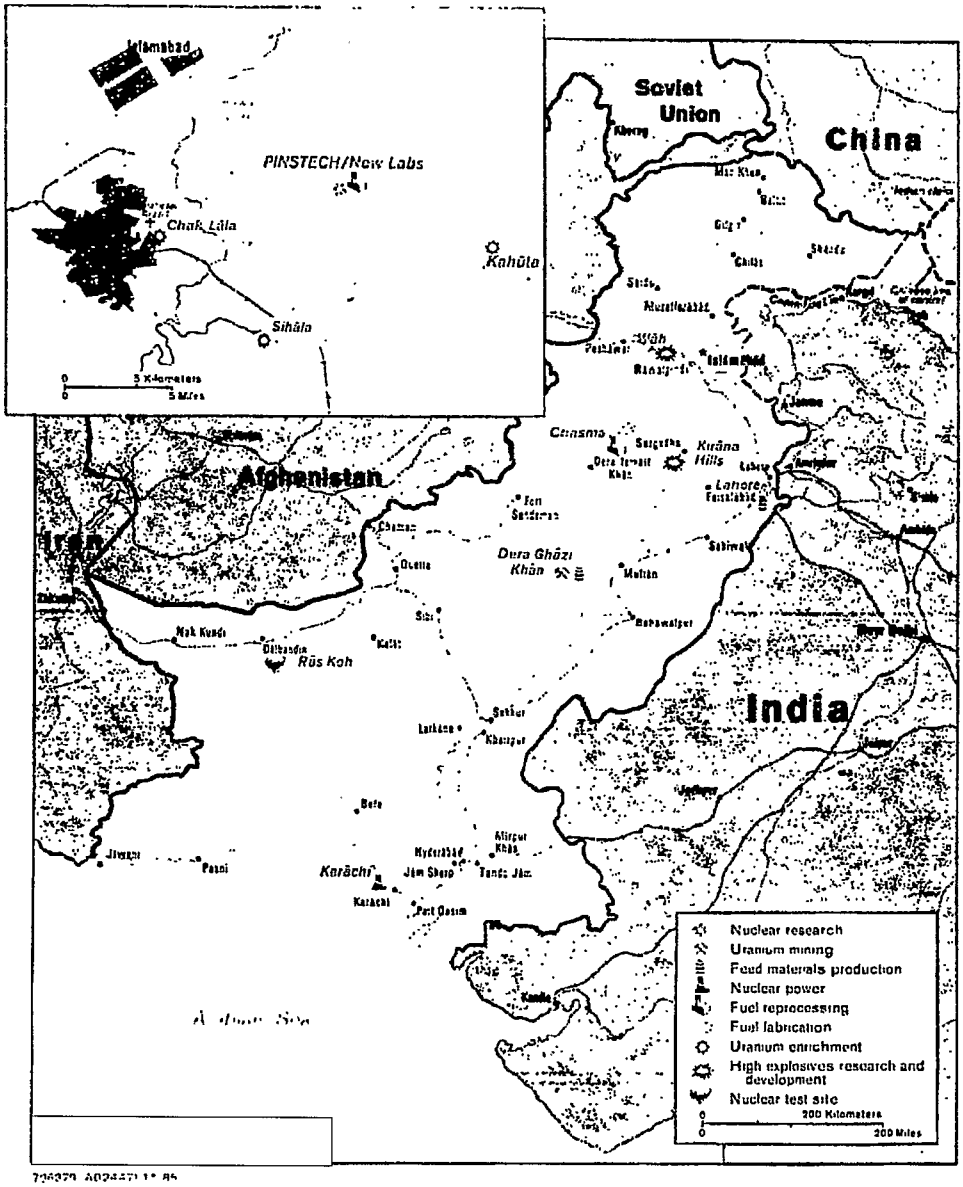
Contents

Nuclear Facilities in Pakistan



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Pakistan's Nuclear Weapons Program: Personnel and Organizations

Pakistan has had personnel and facilities dedicated to the pursuit of a nuclear weapons capability since 1971. These resources are involved in the design, fabrication, and testing of high explosives and nuclear weapons parts. Pakistani officials boast openly of the capability of enriching uranium to weapons grade by the gas centrifuge method.

Although Western export restrictions after the mid-1970s made it difficult for Islamabad to obtain foreign equipment and technology, Pakistan's scientists have circumvented these controls to acquire sensitive equipment and have made significant progress toward their goal of developing indigenous sources of fissile material.

Weapons-related installations and offices are administered by two separate entities—the Pakistan Atomic Energy Commission (PAEC) and Khan Research Laboratories (KRL). Most of the research and development facilities are run by the PAEC. Uranium enrichment is controlled by KRL. There are few points of contact between the PAEC and KRL except in the production of fissile material.

Munir Khan, Chairman of the PAEC

The PAEC consists of a chairman and four members. We believe the PAEC oversees all nuclear-related activities, including weapons, power, medical, and agricultural research. Day-to-day activities are handled by a system of directorates and divisions that report to the PAEC. The PAEC's premier research facility is the Pakistan Institute of Nuclear Science and Technology (PINSTECH) near Islamabad.

Pakistan Atomic Energy Commission

The PAEC—the governing board for Pakistan's nuclear program—was formed in 1956 soon after Pakistan's nuclear program began. Zulfikar Ali Bhutto, as Minister of Energy and later President and Prime Minister, was the architect of Pakistan's nuclear policy. The PAEC reported directly to Bhutto both as Minister and as Prime Minister. Currently, the PAEC reports to President Mohammad Zia-ul-Haq.

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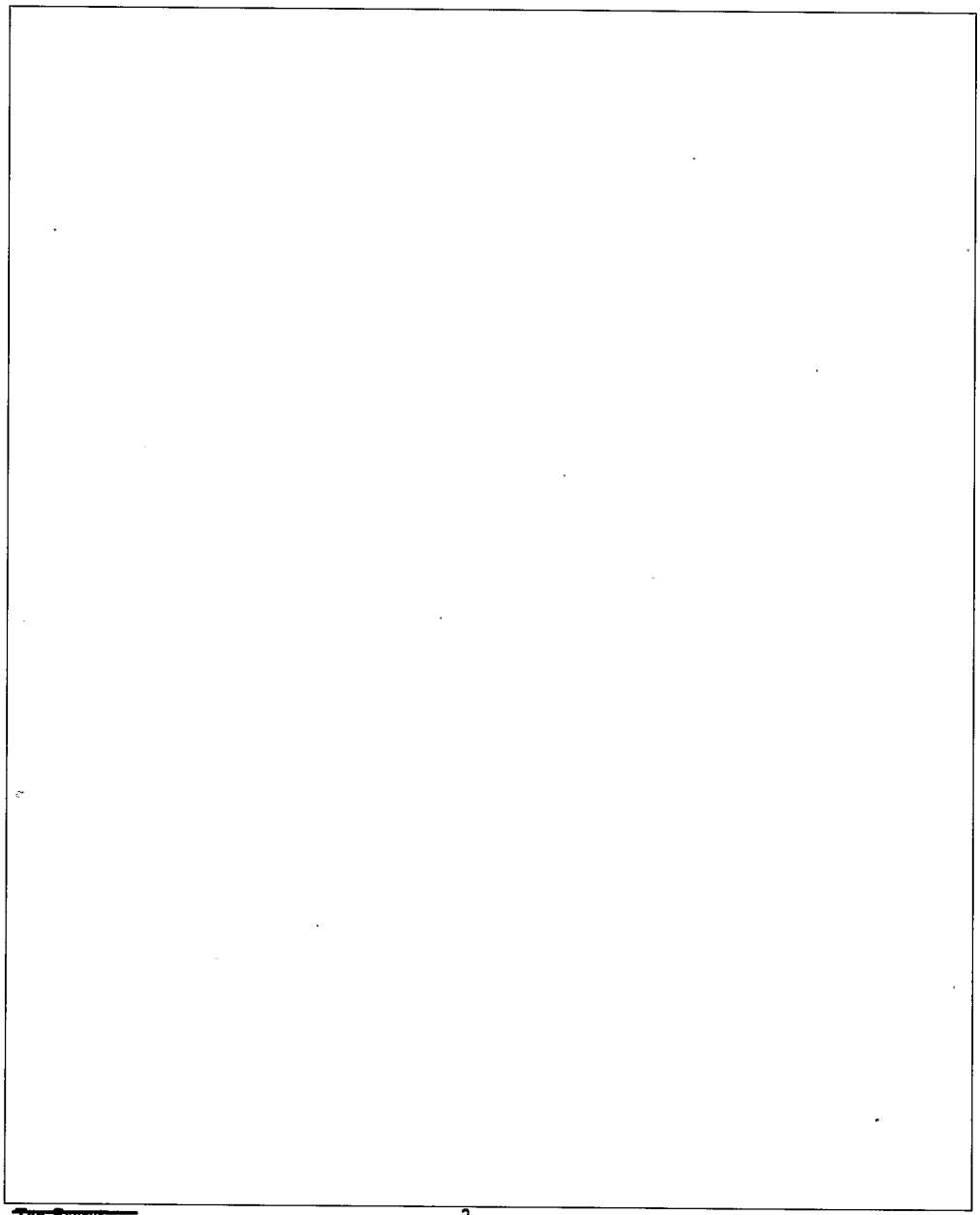

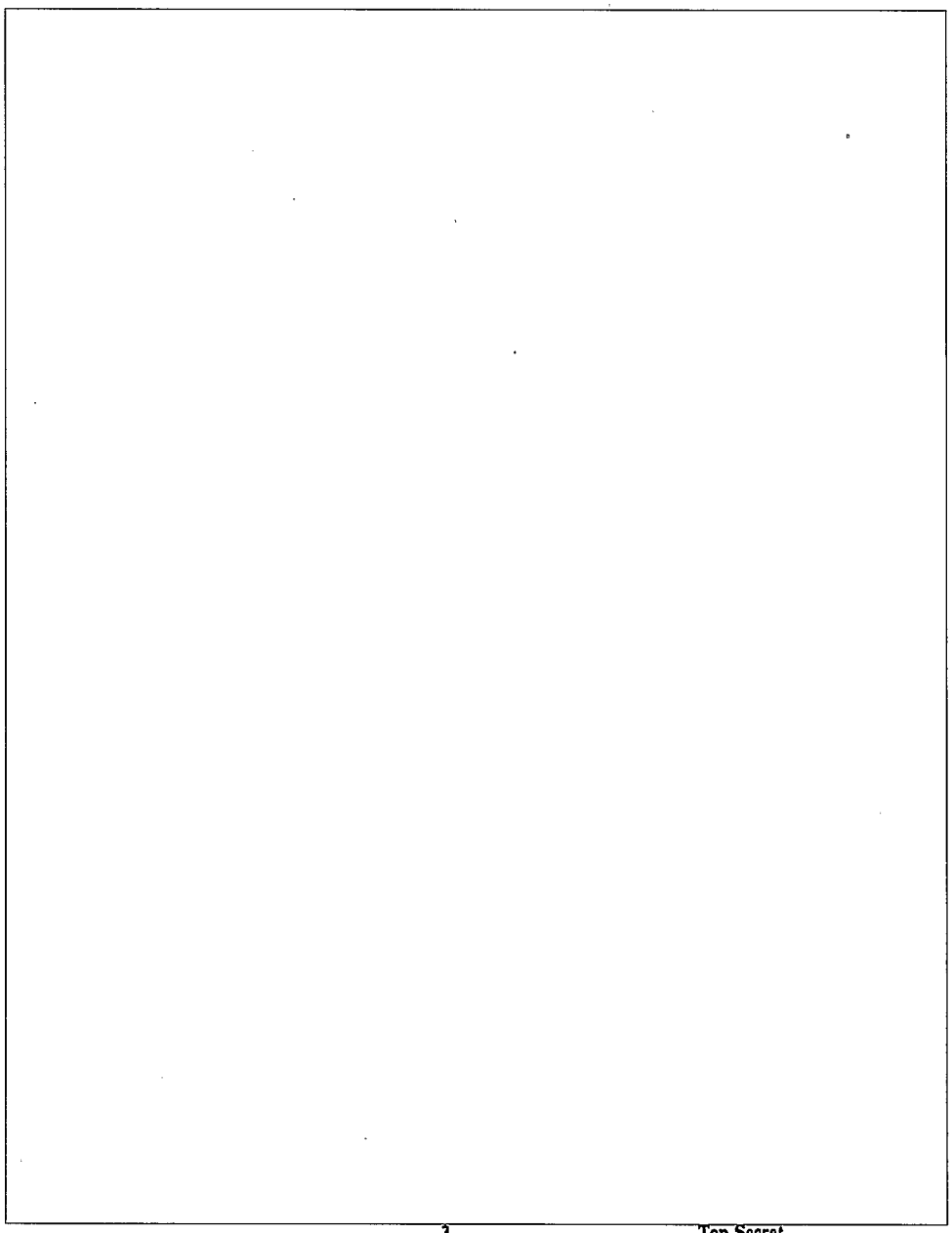

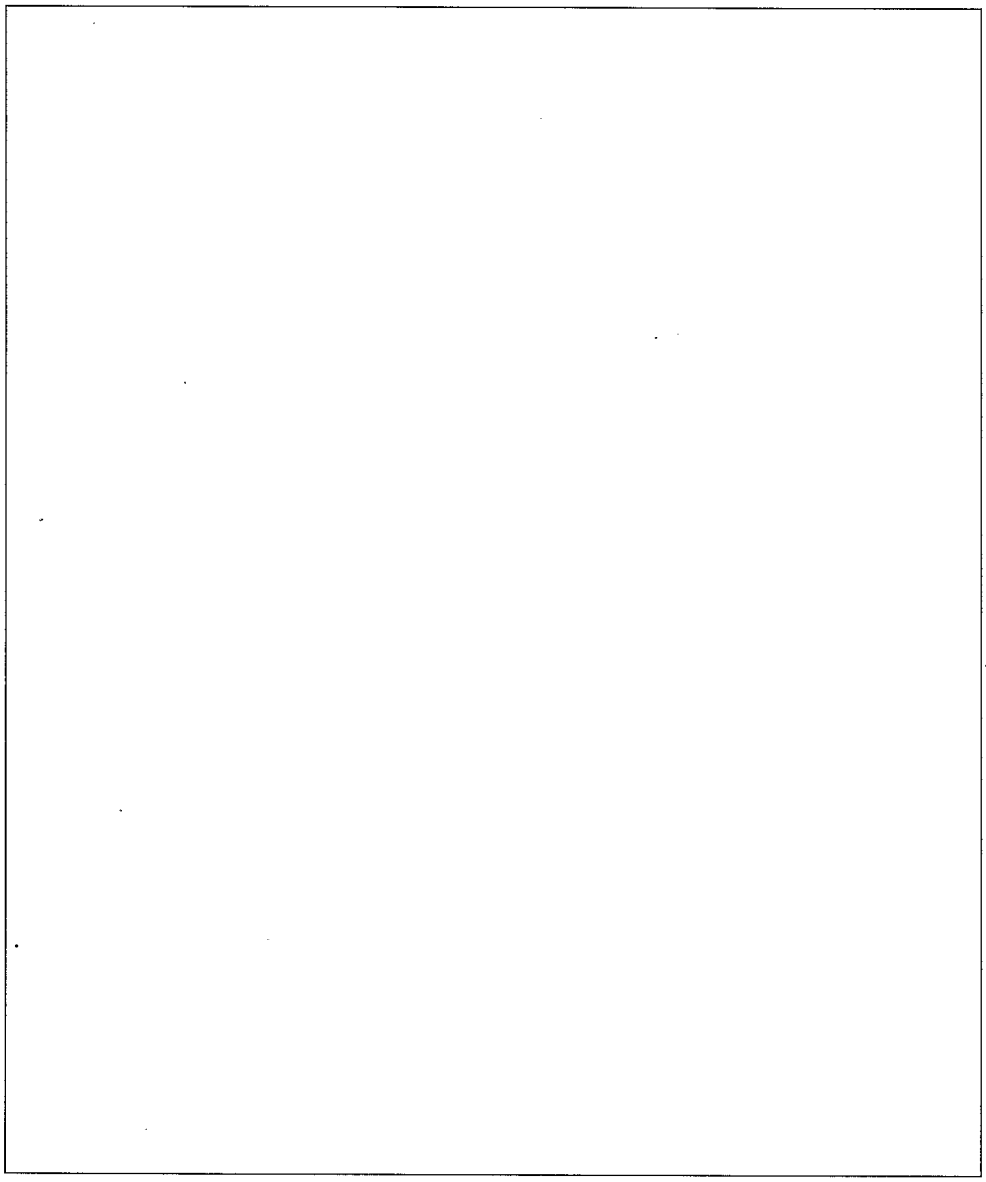

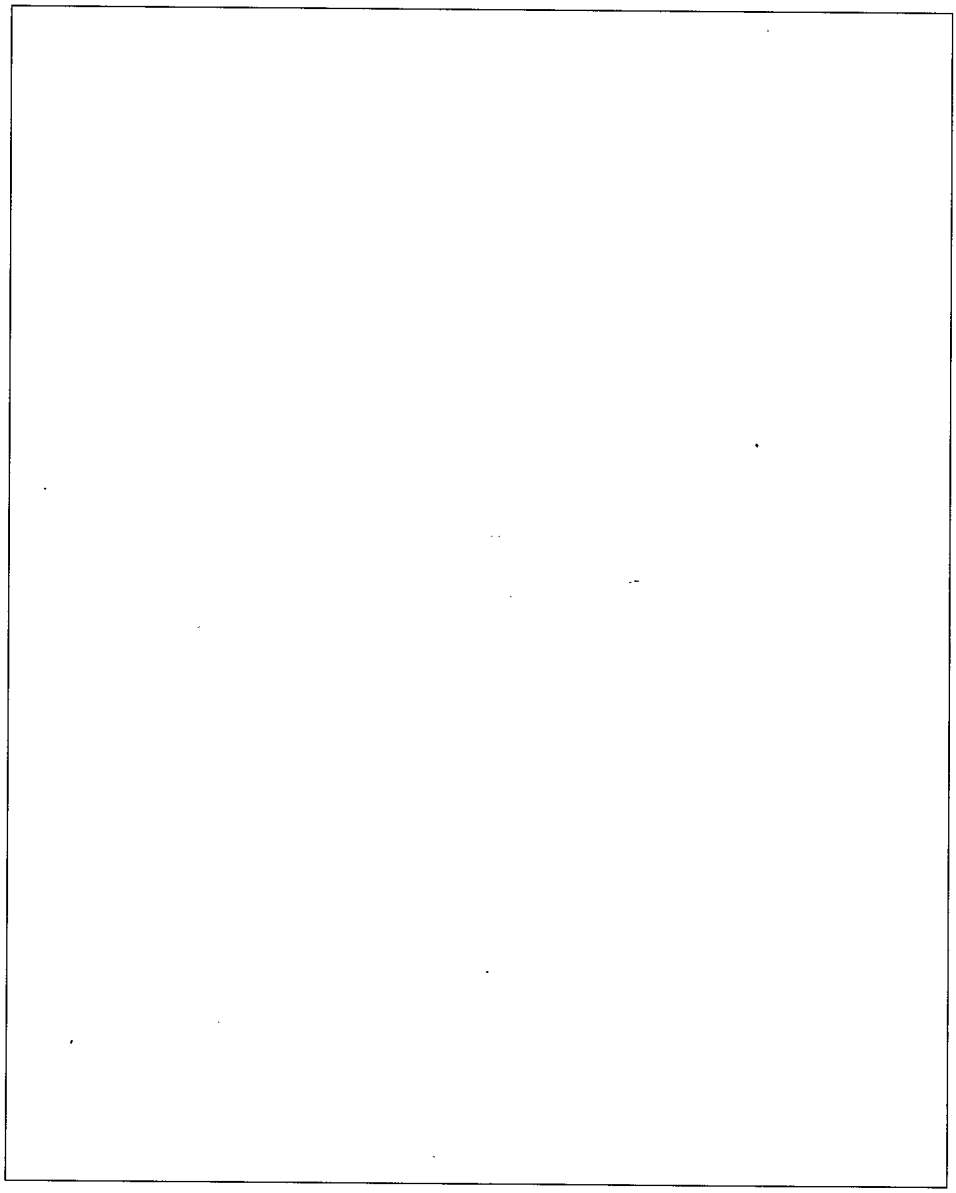

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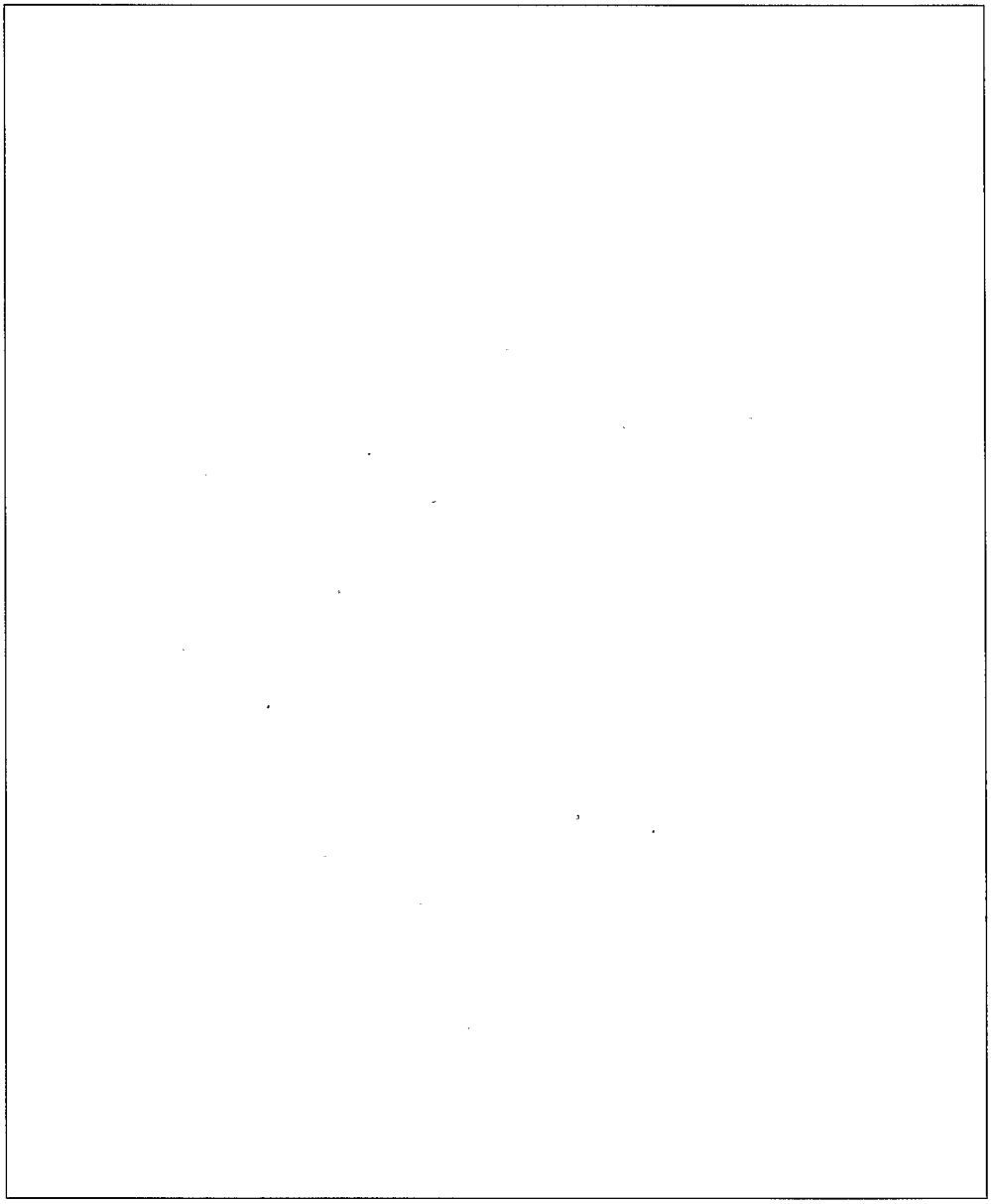


Directorate of Nuclear Fuels and Materials
The DNFM administers research in fuel cycle development at PINSTECH and the production and acquisition of nuclear materials including the procurement and mining of uranium. N. A. Javed is the Director of DNFM and oversees the activities at Kundian Nuclear Complex-1 and -2, Dera Ghazi Khan, and PINSTECH.

According to open sources, the PINSTECH facilities are primarily for civilian nuclear research and development. The New Laboratories, Applied Chemistry Division, and Uranium Metals Laboratory, however, are all associated with or have potential interaction with the nuclear weapons program:

- *New Laboratories.* New Labs contains a pilot-scale fuel-reprocessing plant that is potentially capable of giving Pakistani scientists experience in reprocessing spent nuclear fuel. The facility

contains laboratories for fuel handling, waste management, and plutonium metallurgy. in late 1983, scientists at New Labs believed they were ready to begin reprocessing, but political considerations as well as safety considerations concerning inadvertent radioactive releases apparently have prevented Pakistan from undertaking reprocessing. Moreover, the PAEC would have to divert safeguarded spent fuel from the Canadian-supplied Karachi Nuclear Power Plant to New Labs to obtain enough plutonium for a nuclear weapon, an effort that would take at least five years with the present reprocessing facilities.

- *Applied Chemistry Division.* We believe the Applied Chemistry Division (ACD) at PINSTECH is involved in the conversion of uranium dioxide to uranium tetrafluoride (UF_4), a preliminary step to the production of uranium hexafluoride (UF_6), the feed material for the Khan Research Laboratories enrichment plant. Headed by Aminuddin Ahmad, the ACD was established in January 1984 from the Special Materials Group (also headed by Aminuddin the DTD handles some of ACD's procurements and covers some of its operating expenses.

- *Uranium Metals Laboratory.* UML (also known as K-Block) fabricates and machines the parts for a nuclear device implosion system UML is located in the New Labs complex at PINSTECH, and, although it is organizationally part of the Directorate for Nuclear Fuels and Materials, personnel associated with UML respond to the direction of officers within the Directorate of Technical Development and use DTD funds and channels to procure materials.

The Directorate of Nuclear Fuels and Materials also oversees the mining and production of nuclear materials at the following sites:

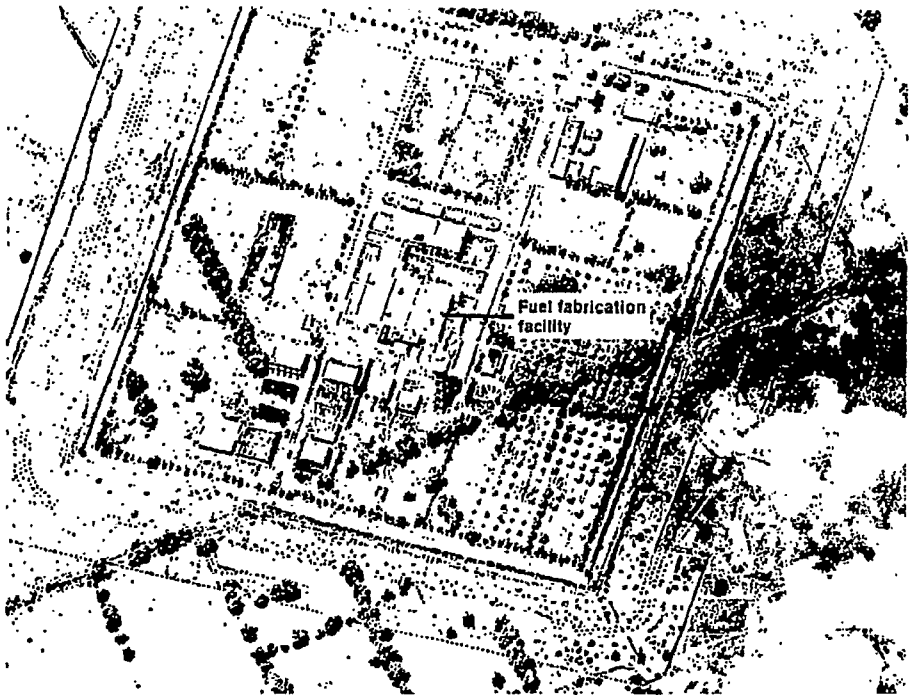
- *Kundian Nuclear Complex-1 (KNC-1).* Also known as the Chasma Fuel Fabrication Plant, KNC-1 is a production facility for the fabrication of reactor fuel assemblies for the Karachi Nuclear Power Plant (KANUPP). KNC-1 is not under any safeguards agreement and, when fully operational, could provide enough unsafeguarded fuel to operate the KANUPP reactor.

- *Kundian Nuclear Complex-2 (KNC-2).* In our judgment, this plant, also known as KNC-2 or the Chasma Reprocessing Plant, will not be completed in the next five years unless Pakistan can obtain foreign assistance.

- *Dera Ghazi Khan.* The Dera Ghazi Khan facilities, known as the Chemical Processing Center, consist of a uranium ore concentration plant and the nuclear feed materials complex

Directorate of Nuclear Power

The DNP oversees reactor projects. The PAEC has long expressed an interest in implementing two projects—one based on the Canadian NRX Reactor and the long-planned Chasma Nuclear Power Plant

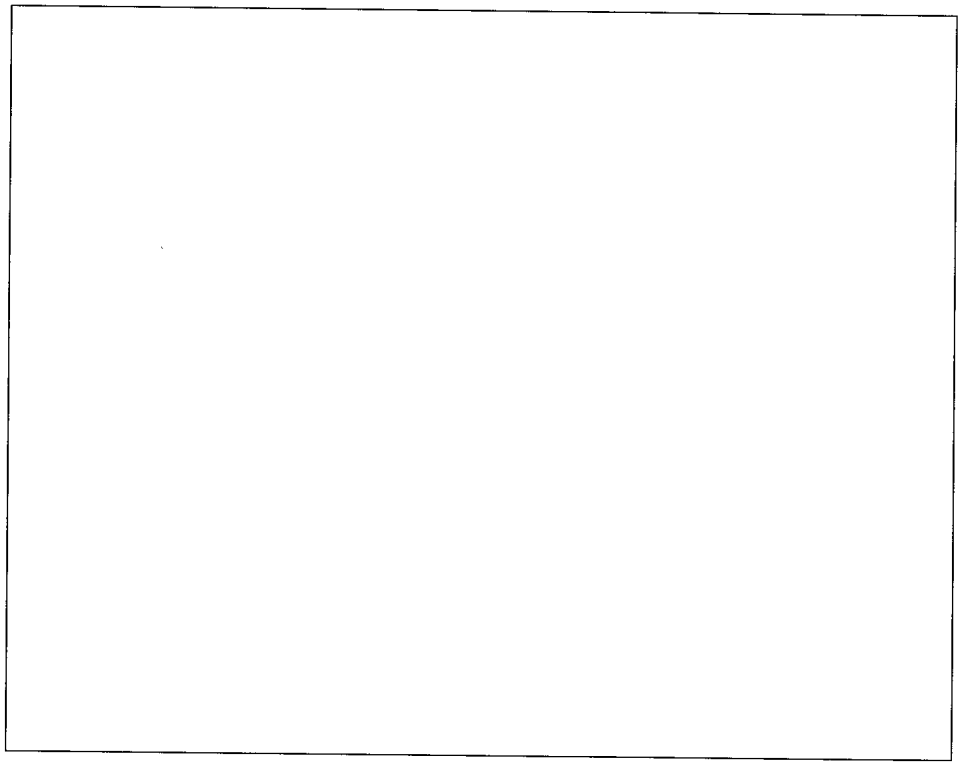


Kundian Nuclear Complex/Chasma Fuel Fabrication Plant

(CHASNUPP). we believe the DNP was formed from elements of the Directorate of Industrial Liaison and the Division of Nuclear Power. It is headed by Bashiruddin Mahmood, former chief of the now-defunct Directorate of Industrial Liaison.

We believe Pakistani interest in the NRX--a natural uranium-fueled, heavy-water-moderated reactor that uses a graphite reflector—may indicate a plan to build a plutonium production reactor

The recent interest in the NRX is shared by the Uranium Metals Laboratory



The UML has been interested in procuring large quantities of graphite, which may be related to interest in a long-term project to build an unsafeguarded reactor.

Directorate of Scientific Engineering Services

the DSES was formed from the former Directorate of Industrial Liaison in late 1984 or early 1985 and is charged with supplying materials to the nuclear weapons program.

Training Programs

The PAEC's domestic program to train scientific and technical personnel reduces both the number of Pakistanis training abroad and the risk of their taking more lucrative jobs overseas. It also enhances nuclear security by controlling opportunities for foreign contacts with Pakistani scientists.

The PAEC introduced a training program in nuclear science at PINSTECH in 1967 and established the Center for Nuclear Studies in 1969. The Center is authorized to award a master of science in nuclear engineering in conjunction with Quaid-i-Azam University. By 1978, [redacted] the Center was awarding between 15 and 20 M.S. degrees annually. [redacted]

[redacted]

In-house training has expanded within the past year, and construction of a Center for Computer Studies began in 1984. [redacted] the Center will train government employees including nuclear scientists and technicians. [redacted]

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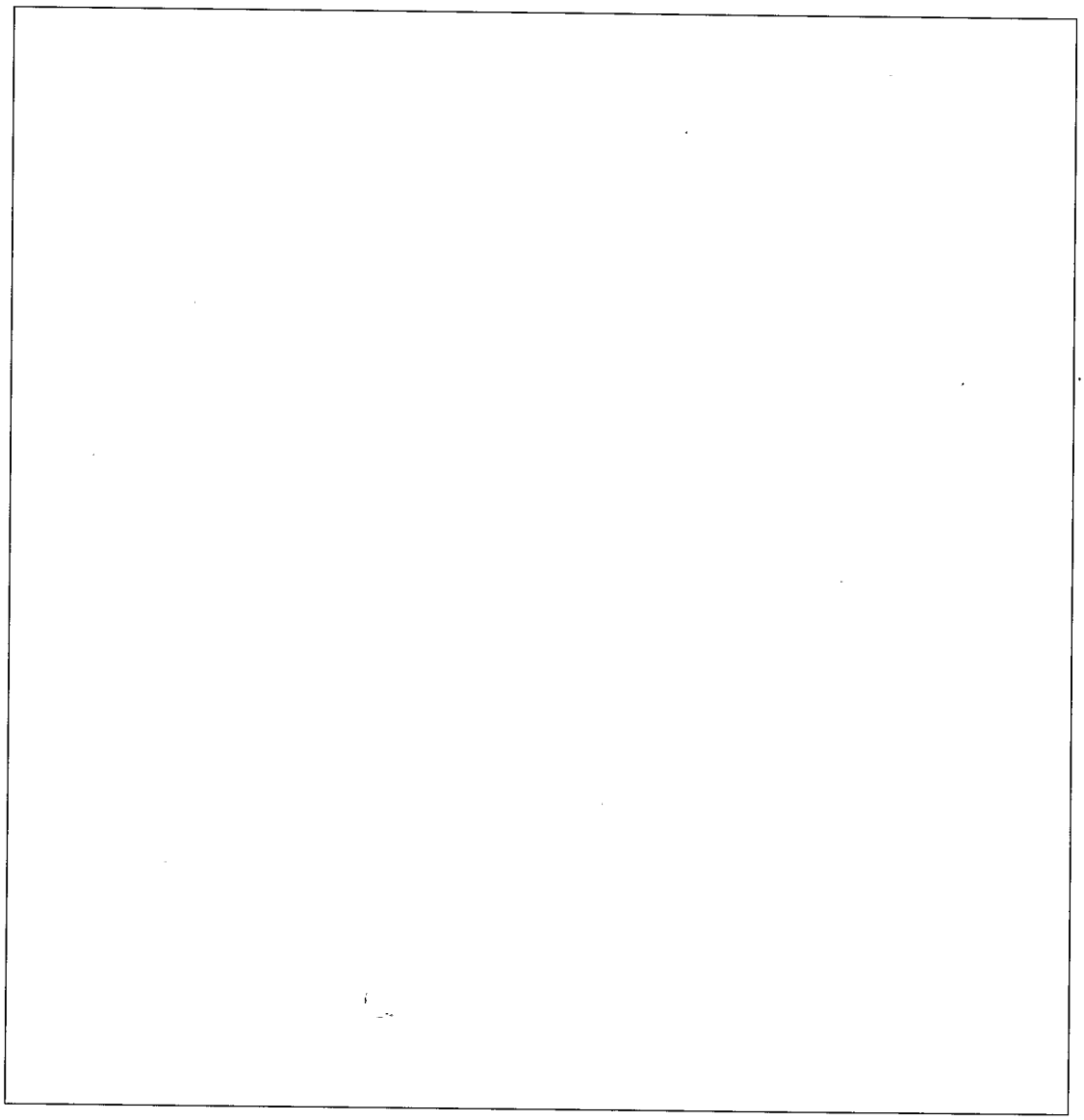

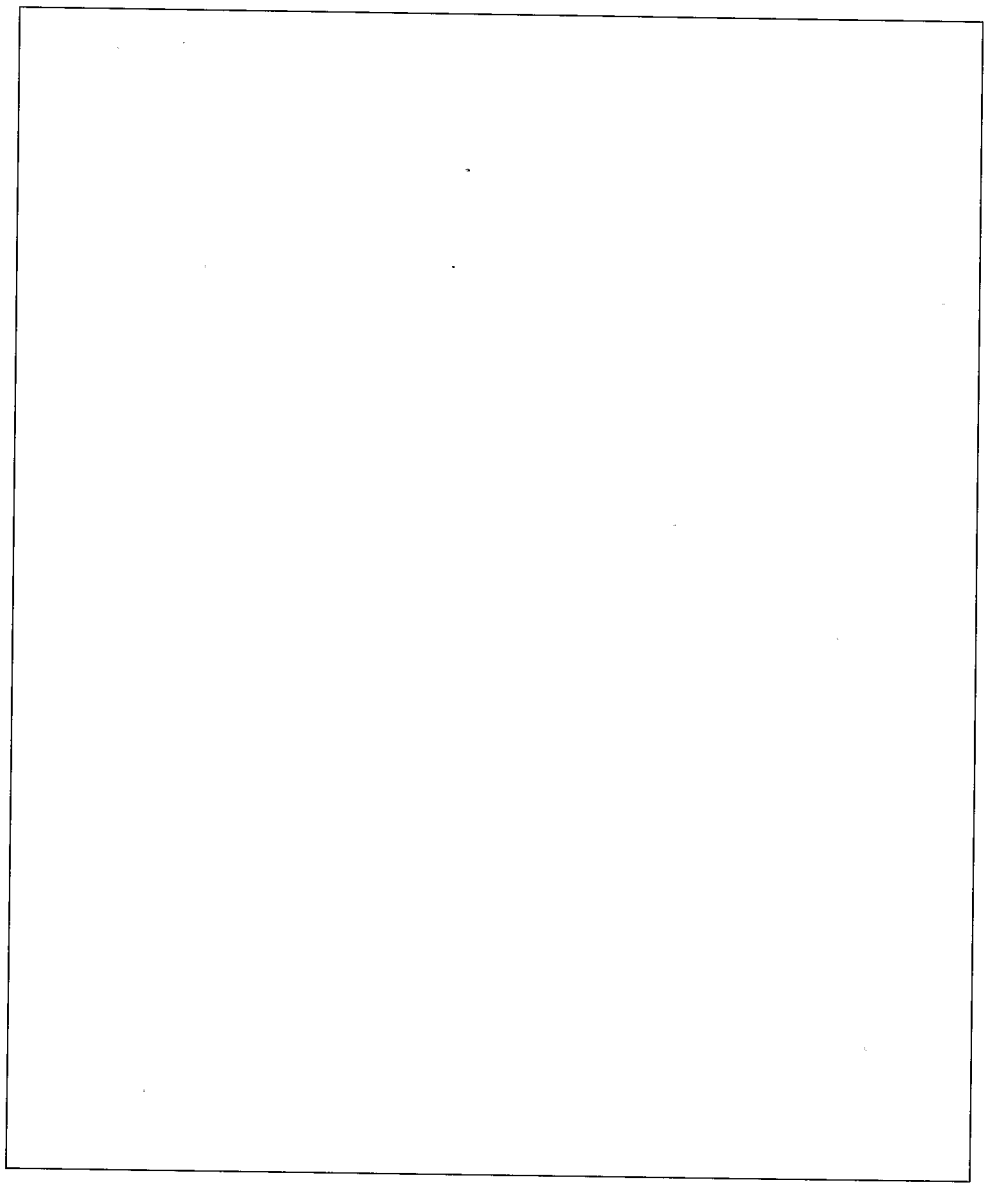

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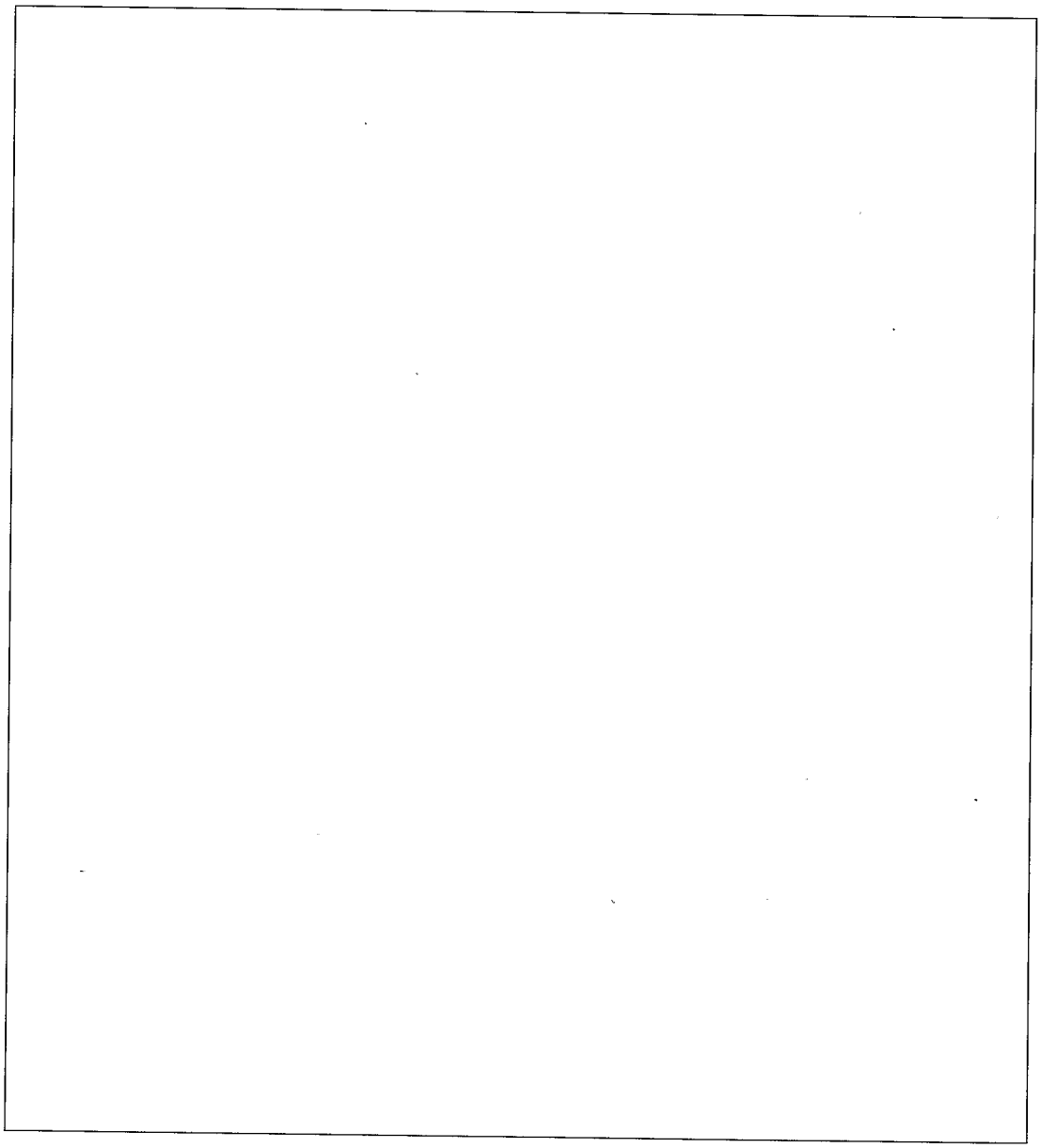

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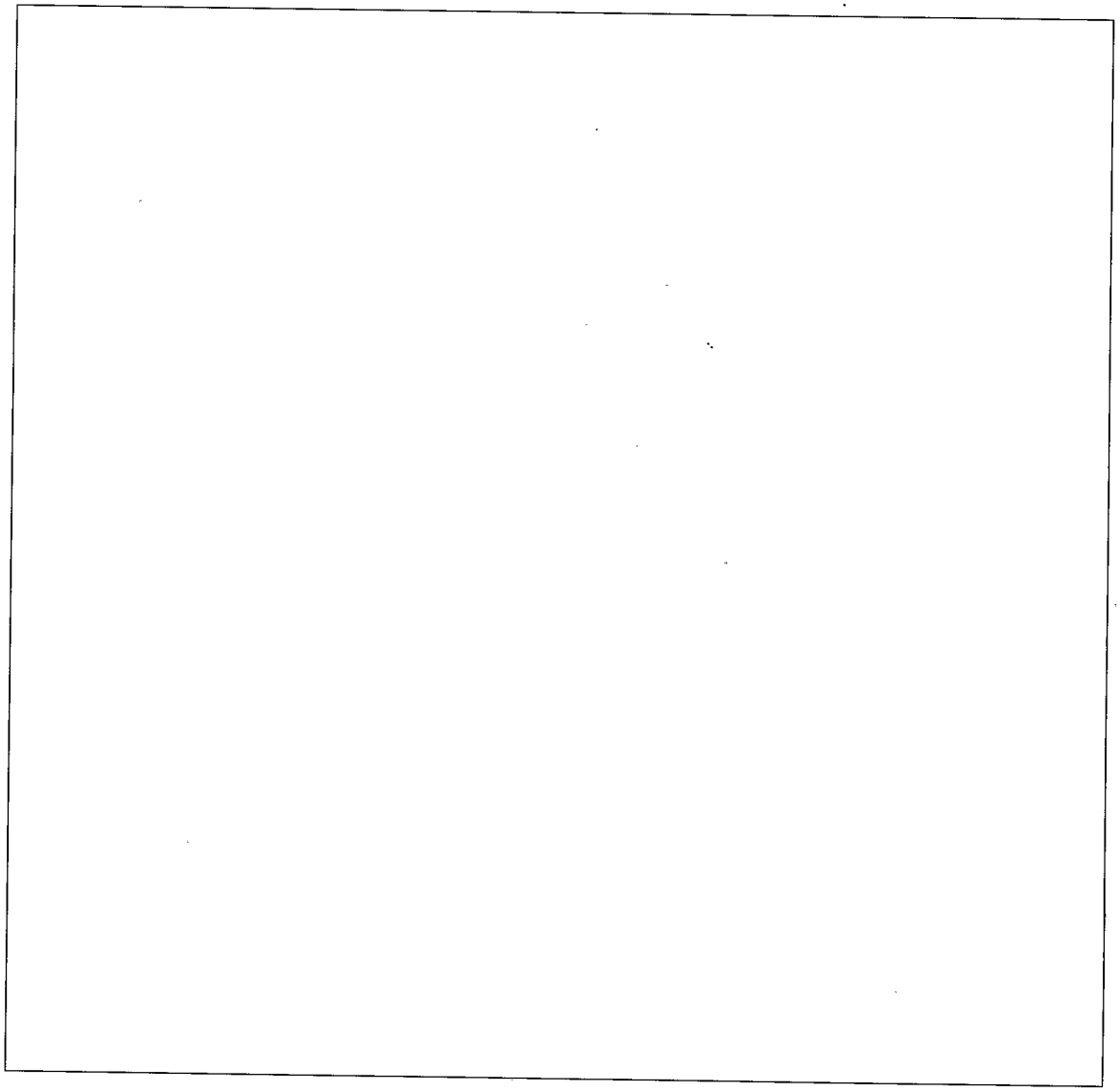

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