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OIL AND GAS SECTOR DEVELOPMENT IN THE BUKHARA REGION OF UZBEKISTAN: HISTORY AND MILESTONES

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Abstract. Natural gas production stands among the most strategically vital branches of the world economy, yet charting its long-term trajectory remains a complex challenge. This study focuses on the evolution of the gas sector in Uzbekistan's Bukhara region, tracing the industrial breakthrough of the mid-twentieth century and evaluating the prospects that emerged thereafter. Particular attention is paid to the major hydrocarbon deposits of the Bukhara-Khiva basin and to the engineering accomplishments that transformed the region into a primary energy supplier for the Soviet Union.

Keywords: natural gas, hydrocarbon deposits, Bukhara-Khiva region, Gazli field, Bukhara-Ural pipeline, Urtabulak, Kyzyl-Kum desert.

DISCOVERY OF THE GAZLI FIELD AND GEOLOGICAL EXPLORATION

A turning point in Central Asian energy history came in 1956 with the identification of the Gazlinskoye gas deposit in the Bukhara region of Uzbekistan. Estimated reserves amounting to approximately half a trillion cubic meters made it the single largest gas field in the entire region. Under the leadership of Alexey Kortunov, who headed Glavgaz at the time, the Gazli production site was organized according to a fundamentally new principle: fully automated operations, high-capacity wells, and integrated installations for gas treatment and compression — all implemented for the first time anywhere in the USSR.

The Gazli breakthrough set in motion an intensive wave of geological surveys across the Bukhara-Khiva region, which forms the northern segment of the greater Amudarya oil and gas province. Within a relatively short span, prospectors working through the barren expanse of the Kyzyl-Kum desert brought to light a series of major fields: Dengizkul-Khauzak-Shady, Urtabulak, Kokdumalak, Kandym, Shurtan, Zevardy, Kemachi, Umid, Kruk, Nishan, and several others. The founding of the Institute of Geology and Exploration of Oil and Gas Deposits in Tashkent provided an important institutional backbone for these efforts.



From the early 1960s onward, newly discovered fields across Uzbekistan were brought into production in rapid succession. By the middle of that decade, Uzbekistan had risen to become the Soviet Union's foremost gas-producing territory. Uzbek reserves supplied the expanding energy demands of the Soviet economy until the later development of the Orenburg and West Siberian fields reduced dependence on Central Asian sources.

Discoveries in neighboring Turkmenistan also contributed meaningfully to the USSR's gas supply during this formative period. The enormous Sovetabad deposit — today known as Dovletabad-Donmez — along with Saman Tepe, Achak, Naip, Gugurtli, Beurdeshek, Bagaja, Shatlyk and related fields added considerable volumes to the national resource base. Familiarity with the region was an asset: Soviet engineers had been active at Nebit-Dagh since the 1930s and at the Caspian coast near Cheleken since the late nineteenth century, giving geological teams a head start in navigating the desert terrain.

THE BUKHARA–URAL GAS PIPELINE

The sheer scale of hydrocarbon reserves concentrated in Central Asia created the conditions for a bold infrastructure initiative. In 1962, on the recommendation of Kortunov, engineering work commenced on the Bukhara–Ural gas pipeline, a project whose purpose was to channel fuel to 33 large industrial centers spread across the eastern Soviet Union — among them Sverdlovsk (present-day Yekaterinburg), Chelyabinsk, Magnitogorsk, Nizhny Tagil, and Orsk. The completed line stretched over 4,500 kilometers, with a pipe diameter of 1,020 mm, a specification that had no precedent anywhere in the world at the time. Kortunov himself fixed the operating pressure at 70 atmospheres and introduced the concept of “field design,” a method that allowed engineering decisions to be made on-site and dramatically compressed construction schedules.

The route traversed extraordinarily difficult terrain. Roughly 400 kilometers passed through rocky ground, an equal distance crossed a landscape of cellular crushed stone, and 120 kilometers wound through shifting sand dunes. The pipeline crossed fourteen rivers and major irrigation canals, plus close to five hundred smaller waterways and streams. Crossing the Amu Darya — the largest single obstacle along the route — required the construction of a 400-meter cable-stayed bridge. Domestic industry supplied the essential components: pipe came from the Novomoskovsky and Chelyabinsk rolling plants; gas turbine units for seventeen compressor stations were produced at the Leningrad Metal Plant; and prefabricated trailers to house the twenty thousand construction workers on the route were manufactured at the Tallinn Lauristini plant.



Despite these formidable obstacles, the entire pipeline was completed within three years. An advanced automation and telemechanics system allowed the highway to be controlled remotely, with technological processes running largely without human intervention. Active geological survey work conducted in parallel along the corridor resulted in additional discoveries. By 1966, the Gazli production complex and the broader Central Asia–Center pipeline network had reached their designed operational capacities.

THE URTABULAK ACCIDENT AND ITS RESOLUTION

Not all aspects of this rapid industrial expansion unfolded without incident. In December 1963, during drilling operations at the large Urtabulak deposit in the Bukhara region, a critical failure occurred: the drill string penetrated a reservoir zone characterized by abnormally elevated rock pressure — close to 300 atmospheres — combined with a significant concentration of hydrogen sulfide. The gas that erupted to the surface ignited immediately, producing a column of flame seventy meters in height. The volume of burning gas reached twelve million cubic meters per day.

The intense heat generated by the blaze made it physically impossible to approach within 200 meters of the site. The surrounding landscape was transformed: the earth turned a scorched red and was blanketed with a thick accumulation of carbon soot. Wildlife behavior altered noticeably in the wider vicinity, while proximity to the well itself proved fatal — flocks of migratory birds and swarms of insects, drawn by the light, flew into the superheated air column and were incinerated. So prominent was the torch that aviation authorities incorporated it as a navigational beacon on the Europe–India–Southeast Asia air corridor.

Conventional firefighting measures, including artillery barrages using large-caliber weapons, failed to extinguish the blaze. Authorities ultimately concluded that only a controlled underground nuclear detonation could seal the reservoir. A charge with a yield of 30 kilotons — roughly twice the destructive power of the Hiroshima bomb — was placed in a borehole drilled to a depth of 1,500 meters. The explosion displaced the surrounding rock strata, cutting off the gas flow, and within seconds the fire that had burned continuously for more than one thousand days and nights was extinguished. Crucially, the productive formations themselves sustained no damage, and hydrocarbon extraction at Urtabulak has continued without interruption to the present day. The technique proved its reliability and was subsequently applied to suppress major blowout fires at the Pamuk field in Uzbekistan’s Kashkadarya region and at the May field in the Mary region of Turkmenistan.



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