

Elgi Compressors for Nuclear Power

Natural uranium converted into pellets is the vital fuel for Pressurized Heavy Water Reactors in India.

The mining and processing of uranium ore, the initial steps leading to nuclear power generation, are undertaken in India by the public sector Uranium Corporation of India Limited (UCIL). This is under the administrative control of the Department of Atomic Energy. UCIL was founded in 1967 with its headquarters at Jaduguda in Bihar, where the country's first underground uranium mine was established the same year. UCIL manages the mining of uranium ore and its processing into uranium oxide concentrates or yellow cake.



Uranium is found in nature in the form of minerals. Uranium occurs in most rocks in concentrations of 2 to 4 parts per million. Uranium ore can be mined by underground or open-cut methods, depending on its depth. After mining, the ore processing is done in three stages: crushing, grinding and leaching. The ore is crushed and ground and uranium is leached into solution by sulphuric acid. The solution is filtered, concentrated and purified, and uranium is precipitated in the form of magnesium diuranate or yellow cake. The yellow cake thus formed is sent to the Nuclear Fuel Complex (NFC), Hyderabad to be sintered into uranium bundles to become the fuel for the nuclear reactors.



At underground mines of UCIL, the opening of the quarry is done by cutting trenches towards ore body. Tunnels and vertical shafts are dug to the depth of this ore body. These drilling operations are carried out by jackhammer and other pneumatic tools powered by air compressor. Rock penetration rates may be greatly improved by increasing the air pressure of the hammer. Hence it's essential that the compressors should deliver large volumes of compressed air required and also absolute reliability with continuous operation. The air needed for this work is supplied by Elgi compressors at UCIL's Kadapa site. The rugged portable diesel powered compressors with a

capacity of 600 cfm operate at a pressure of 7 bar(g). These high pressure compressors are also employed to de-water the tunnels inside the mines.

UCIL also uses Elgi's stationary electric powered screw compressors for driving pneumatic tools, tire filling and service at its mining equipment workshops. UCIL's contract demanded very careful mining to ensure the mineral processing plant can deliver competitive and cost-effective feed to the nuclear reactors. Elgi, who has been a key solutions provider of compressed air in mining industries for over five decades, has met their demands successfully.

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