

Alumina Refinery Project Builds India's Production Capacity

Simple file customizations save time valued at nearly \$230,000 for \$36 million project

With strong global demand continuing in the aluminum market, Utkal Alumina International is expanding production capacity with a new 1.5 million tons per annum alumina refinery in India. Located in the state of Orissa on the eastern coast, the facility will source bauxite from the Baphlimali reserves in the district of Rayagada.

The Utkal Alumina Refinery will be a boon for the Orissa economy. Like many Indian states, Orissa's development depends on industrial expansion, particularly in metals production. As India's 11th most populous state, Orissa contains one-third of the country's bauxite (aluminum ore) reserves. With offices in Calcutta, U.S.-based Quotient Engineering estimates that increased capacity at the Utkal refinery could affect up to 5 million downstream users who, directly or indirectly, need more material for projects and manufacturing. This plant will also have a direct impact on the local community's standard of living in the form of new jobs at the plant and more jobs supporting plant workers.

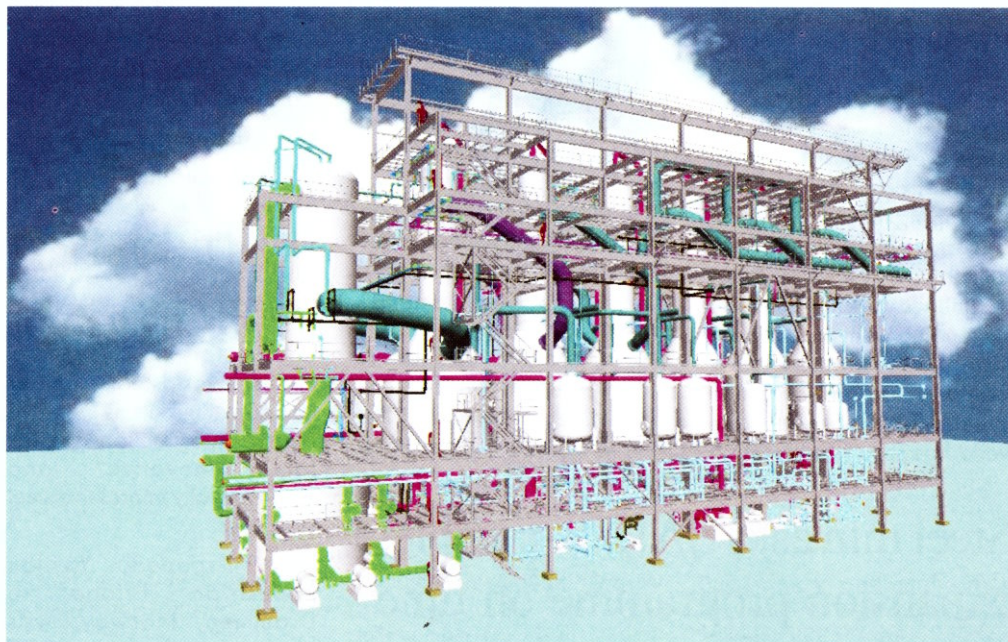
As part of the refinery project, Quotient Engineering was retained to install an evaporation plant to concentrate spent sodium aluminate liquor. The plant is comprised of two identical batteries of multiple-effect evaporators. The maximum spent liquor feed capacity per battery is 1,150 tons per hour, and the resulting concentrated liquor per battery can be as much as 840 tons per hour.

The project team wanted to use AutoPLANT when coordinating the design and construction of the evaporation plant, but there was a challenge. General Manager of Engineering Abhijit Pakrashi explained, "AutoPLANT was the perfect choice for this project, but there were two obstacles. First, there was no provision for defining the line design parameters, such as pressure and temperature, within AutoPLANT—and those parameters had to appear in

subroutine to the OPCFHDR.EBS file that read parameters from a simple list created in Excel. To meet the client's requirements for graphic output, a customized graphics library was created as a FINAL.ASC/FINAL.BIN file with the desired support images. "With these modest changes, we found that AutoPLANT was the ideal tool for handling a project of this size," Pakrashi said. "It was flexible, user friendly, and much easier to learn than other software in this niche."

pipe flexibility, and the ability to use this data in AutoPLANT increased the utility of both programs many times, according to Pakrashi. In addition, the ability to import STAAD models greatly reduced man-hours and human error.

Pakrashi estimated that using AutoPLANT on the \$36 million Utkal Alumina Liquor Evaporation Project saved nearly a quarter of a million dollars. He noted, "In terms of man-hours, the approximate savings were



the isometric drawings for the evaporators. Second, isogen graphics for pipe supports couldn't be customized to meet the client's requirements. Fortunately, we were able to overcome these challenges."

Quotient Engineering learned it could customize a small number of files to get AutoPLANT to produce the desired outputs. To use custom design parameters, the project team added a

Bentley's interoperability was also a big factor in this project's success. Quotient Engineering uses multiple Bentley products, as well as third-party software—all essential to multidiscipline design workflows. Files from multiple vendors and multiple software tools were routinely imported into AutoPLANT. For example, Quotient Engineering uses a third-party tool to analyze

2,000 man-hours for isometrics generation and 10,000 man-hours for field engineering—these savings were mainly due to the avoidance of clash and interference problems thanks to model review. We saved 250 man-hours when generating material takeoffs and 500 man-hours of structural modeling because we could import from STAAD. In dollar terms, we saved about \$230,000." □