G. H. PATEL COLLEGE OF ENGINEERING & TECHNOLOGY
Vallabh Vidyanagar

Department of Mechatronics

Adani Group Companies – Mundra Port Visit Report

Name of Industry	: Adani Group Companies – Mundra Port
Date of visit	: 20th – 21st March 2024
Number of Students Participated	: 54 (Including 1st, 2nd and 3rd year students)
Faculty Members	: Dr. Vinod Patel Prof. Sanjiv Rajput

Work profile:

Adani Group is an Indian multinational conglomerate, headquartered in Ahmedabad. It was founded by Gautam Adani in 1988 as a commodity trading business, with the flagship company Adani Enterprises. The Group's diverse businesses include port management, electric power generation and transmission, renewable energy, mining, airport operations, natural gas, food processing and infrastructure.

Visit Schedule: Adani Group Companies – Mundra Port

First Day (20th March 2024)

Time Slot	Location	Activities
4 AM from Ahmedabad	CTM Ahmedabad	Commencement of journey to Mundra from allocated location at Ahmedabad
7 AM	On the way	30 min. break for breakfast
1.15 PM	Shanti Vihar Mundra	Arrival at Shanti-Vihar in Mundra & Room allocation
1.30 PM	Shanti Vihar Mundra	Lunch at Shanti-Vihar Guest House
2.30 PM	Adani Ports & SEZ	Visit to Adani Ports & SEZ
4.30 PM	Adani Wilmar Ltd	Visit to Adani Wilmar Ltd.
6.00 PM	Shanti Vihar Mundra	Tea break & Additional Activities
8.00 PM	Shanti Vihar Mundra	Dinner at Shanti-Vihar Guest House
9.00 PM	Shanti Vihar Mundra	Cultural programme/activities by students
10.00 PM	Shanti Vihar Mundra	Rest

Second Day (21st March 2024)

Time Slot	Location	Activities
6:00 AM	Shanti Vihar Mundra	Wakeup & Yoga sessions
8:00 AM	Shanti Vihar Mundra	Tea/coffee and breakfast
9:00 AM	Adani Power Ltd.	Visit to Adani Power Ltd
11:00 AM	Adani Solar & Windtech	Visit to Adani Solar and Visit to Adani Windtech
12:15 PM	Shanti Vihar Mundra	Lunch at Shanti-Vihar Guest House
1:15 PM	Shanti Vihar Mundra	Departure from Shanti Vihar Mundra
6:30 PM	On the way	30 minutes break for high tea
11:00 PM	CTM Ahmedabad	Reaching back to respective destination at Ahmedabad

Adani Mundra Port:

Mundra Port is known for its versatility and extensive infrastructure. Along with multipurpose terminals It boasts deep berths covering nearly two thousand meters in lengths and depths ranging from 9 to 25 meters. Situated in the Northern Gulf of Kutch, it holds the distinction of being India's inaugural multi-product special economic zone (SEZ), strategically positioned to facilitate trade across various sectors. This strategic location ensures connectivity through different transportation modes, including rail, road, air, and pipelines.

One of Mundra Port's notable features is its seamless integration with India's vast railway network through a dedicated 76-kilometer rail line connecting Mundra to Adipur. This railway infrastructure is designed to handle a significant volume of train traffic, with the capacity to manage up to 130 trains daily, including specialized trains like double stack container trains and long-haul freight trains. Additionally, Mundra Port enjoys excellent connectivity to major northern and western Indian regions via National Highway 8A Extn. and State Highways 6 & 48. To optimize transportation efficiency, the port has constructed a four-lane rail-over-bridge (ROB) near it to ensure smooth movement of goods between road and rail networks.

Adani Mundra Port

Air connectivity is another strength of Mundra Port, with Mundra Airport operating under the oversight of the Airports Authority of India (AAI). This licensed airport features air traffic control (ATC) services, supporting efficient air cargo operations. While Mundra Airport serves as a crucial aviation hub, nearby commercial airports in Bhuj and Kandla further enhance regional connectivity, catering to passenger and cargo traffic.

In addition to its maritime and aerial connectivity, Mundra Port plays a pivotal role in inland transportation through its extensive pipeline network. These pipelines facilitate the transportation of various petroleum products to key destinations such as the IOCL Panipat

refinery, Bathinda refinery, and the national capital region. This integrated transportation infrastructure underscores Mundra Port's status as a comprehensive logistics hub, catering to diverse industries and cargo types.

The port's capabilities extend beyond conventional cargo handling, encompassing a wide range of commodities such as dry bulk, liquid cargo, automobiles, and project cargo. To support these operations, Mundra Port is equipped with advanced technological cargo handling equipment including mobile harbor cranes, grab ship unloaders, pay loaders, excavators, and conveyor systems. Additionally, the port collaborates with external resources such as hired dumpers for efficient cargo transfer between berths and storage areas, ensuring smooth logistics operations.

Visit group photo at Adani Mundra port

Within Mundra Port's operational framework, Adani Ports & Special Economic Zone Limited plays a significant role in managing and handling various commodities. These include fertilizers like urea, DAP, and MOP, agricultural commodities such as yellow peas and wheat, liquid cargo comprising crude oil, chemicals, and edible oils, as well as diverse cargo categories like steam coal, coking coal, containers, automobiles, steel cargo, project cargo, and minerals. This diverse portfolio underscores Mundra Port's importance as a key gateway for both domestic and international trade, serving as a vital link in India's logistics and supply chain ecosystem.

Adani Wilmar Limited:

Adani Wilmar Limited (AWL) started in January 1999 as a partnership between Adani Group, known for global trade and infrastructure in key sectors like resources and energy, and Wilmar International Limited from Singapore, a top agribusiness group in Asia. Their goal is to contribute significantly to national growth by developing essential economic assets.

Wilmar International Limited is a major player in agriculture, covering activities from oil palm cultivation to grain processing across China, India, Indonesia, and many other countries. They have a vast network of manufacturing plants and distribution channels.

At Adani Wilmar, the refining process starts with Bleaching. It removes major impurities from the oil, deteriorating the color of the oil. Next, the bleached oil is Filtered, and hence heavy impurities are removed, followed by deodorization to eliminate crude oil odor and then it is passed through high vacuum pressure at 250°-270° C to obtain the final refined product. This comprehensive process ensures high-quality oil production.

Automation using Programmable Logic Controllers (PLCs) makes the refining process at Adani Wilmar fully automatic, reducing human involvement. They also have advanced cold storage units where the temperature is gradually lowered to -5° Celsius to maintain oil quality during packaging and storage.

Moreover, by-products like fatty acids and other impurities removed during refining are utilized in industries such as soap and incense stick production, minimizing waste and maximizing resource efficiency.

Adani Wilmar's advanced facilities and commitment to sustainable practices enable them to produce between 6000 to 7000 litres of oil per hour, making them a leading player in the edible oil industry while contributing positively to the economy and environment.

Activities at Guest house:

After returning to the guest house students visited the Shantinath Mahadev Temple during the evening arti. It was followed by dinner and some cultural and fun games and activities at night.

Next morning on 21st of March there was a Yoga session followed by a laughing session. It did strengthen us to our core. After the morning health session followed breakfast.

After breakfast, there was a visit to Adani Power Plant, followed by Adani Windtech and Adani Solar.

Adani Thermal Power Plant:

The Adani Thermal Power Station is situated in Mundra, Gujarat, in India's Kutch district. It belongs to Adani Power and relies on coal primarily imported from Bunyu, Indonesia. The plant draws its water supply from the Gulf of Kutch.

Plant capacity is 4620 MW, comprising 9 units with 4 units of 330 MW and 5 units of 660 MW. The 330 MW units are based on subcritical technology and the 660 MW units are based on supercritical technology. To help the state and region utilities evacuate electricity from the plant and into the grid, Adani Power had constructed two power lines. The 433 km, 400 KV transmission line to transmit 1000 MW from Mundra to Dehegam in Gujarat and the 989 km, 500 KV high voltage Direct current (HVDC) bipole line with the capacity to transmit 2500 MW from Mundra to mohindergarh in the northen state of Haryana. The latter is the first and longest HVDC system by a private player in India.

Largest single location private coal-based power plant in the world. Adani Power created history by synchronizing the first super-critical technology based 660 MW generating unit at Mundra. This is not only the first super- critical generating unit in the country but also the fastest project implementation ever by any power developer in the country with synchronization within 36 months from the inception. Phase III of the Mundra Project, which is based on supercritical technology, has received 'Clean Development Mechanism (CDM) Project' certification from United Nations Framework Convention on Climate Change (UNFCCC). This is the world's first thermal project based on supercritical technology to get registered as CDM Project under UNFCCC.

Adani Windtech

Adani Wind specializes in developing, constructing, owning, operating, and maintaining large-scale renewable energy projects connected to the national power grid. They earn revenue by selling electricity to government entities and government-backed corporations at both central and state levels. The company focuses on wind project development and carefully assesses various regions across the country for their wind energy potential. They have installed wind-masts in resource-rich areas to confirm wind resources and optimize site selection.

Adani Wind aims to become a leading global manufacturer and supplier of advanced wind turbine components such as Blades, Nacelles, and Hubs. Their focus on sustainable energy solutions, cutting-edge technology, and industry expertise drives their commitment to positively impact the renewable energy sector.

The manufacturing process at Adani Wind involves producing wind turbines and assembling them on-site. The current wind turbine stands at an impressive 200 meters in total length (including blades) with a rotor diameter of 160 meters, generating 5.2 megawatts of energy daily. The turbine's design allows it to rotate up to 900 degrees based on wind direction, optimizing renewable energy capture. Notably, this wind turbine generator is the largest of its kind developed in India.

The company plans to expand its portfolio and increase the capacity of its existing facility in Mundra, India, to 5 gigawatts (GW) in the near future, contributing significantly to India's renewable energy goals and sustainability initiatives.

Adani Solar:

Adani Solar is a fully integrated solar company with a manufacturing capacity of 4 gigawatts (GW), offering a range of products and services in photovoltaics manufacturing. They use cutting-edge technology and top-quality equipment to achieve cost leadership, scale operations, and maintain global reliability standards.

Currently, Adani Solar is developing a comprehensive ecosystem for solar PV manufacturing with a capacity of 10 GW in Mundra, India. In the solar panel manufacturing process, the metallurgical grade silicon or polysilicon is made into cylindrical or cuboidal ingots. From these ingots the material is sliced into thin wafers. These small wafers are put together in rows and columns to make solar cells. Then multiple of these cells are placed together to create modules. Each cell in module is connected in series. The modules are then integrated together in a system to create a solar panel.

Adani Solar is creating the world's first fully integrated ecosystem for solar PV manufacturing in Mundra. This includes the production of metallurgical-grade silicon, polysilicon, ingots, wafers, cells, modules, and ancillary components like glass, EVA, back sheet, aluminum frames, and junction boxes.

After the visit, we returned to the Shantivihar Guest house for lunch and departed from there at 1:30 PM.

The visit was both educational and unforgettable, providing us with valuable insights into various industries, their internal operations, and the functioning of different types of machinery utilized in their processes. As a result, the visit concluded on a positive and enriching note.