School of Electrical and Electronics Engineering

Industrial Visit to

**ABB – (ASEA Brown Boveri)**

(A Publicly traded limited company)

Peenya Plant and R&D

Plot No 5& 6, 2nd Stage, Peenya Industrial Area Phase IV, Peenya, Bengaluru, Karnataka 560058

Faculty Plant Visit Report

(Dated: 12/06/2018)
ACKNOWLEDGEMENT

It is our immense pleasure and honor to be the first batch attending the first-ever organized “Faculty Plant Visit and industry interaction Programme in India’s public sector unit namely ABB (ASEA Brown Boveri) Peenya Plant. ABB Private Limited is the leading public sector operating mainly in robotics, power, heavy electrical equipment and automation technology areas. It is ranked 341th in the Fortune 500 global list of 2018 and has been a global Fortune 500 company for 24 years.

We are thankful to the ABB Management & Staff for the permitting us to undertake the Plant as per visit and interaction program on our request.

We express our sincere gratitude to Mr. Shailender Kumar (ABB), and all the employees who have co-operated in sharing the knowledge and allowing us to learn throughout the training sessions. We also extend our thankful regards to Mr. Nagaraj Hediyal, CEO, eNLiven Technologies, who helped us in understanding the process involved in assembling of electrical heavy machines and manufacturing units of power capacitors.

We are always been motivated to have many such University-Industry training and interactions. First and foremost we would like thank Dr. Rajashekar P. Mandi, Director School of EEE, for his utmost support and encouragement to attend the Plant Training and Industry Interaction

We would also like to thank our Honorable Chancellor, Dr. P. Shyama Raju, for providing all the required facility and support to attend such Interaction programs. We also thank the Vice Chancellor, Dr. S Y Kulkarni, The Registrar, Dr. M Dhanamjaya, Dr. N. Ramesh, Dean, Training, Placement and Planning.
INTRODUCTION

ABB is a global leader in power and automation technologies that enable utility and industry customers to improve their performance while lowering environmental impact.

ABB Group has yearly revenue of 24 Billion USD with almost 1, 11000 plants around 100 countries along with R&D investments of 1.1 Billion USD. And of leading multinational corporation in the current market scenario.

ABB's history goes back to the late 19th century. Allmänna Svenska Elektriska Aktiebolaget (General Swedish Electrical Limited Company, ASEA) was founded in 1883 by Ludvig Fredholm in Västerås as manufacturer of electrical light and generators. Brown, Boveri & Cie (BBC) was formed in 1891 in Baden, Switzerland, by Charles Eugene Lancelot Brown and Walter Boveri as a Swiss group of electrical companies producing AC and DC motors, generators, steam turbines and transformers.

ABB was created as the result of the merger of the Swedish corporation ASEA and the Swiss company Brown, Boveri & Cie (BBC) in 1988. The latter had acquired Maschinenfabrik Oerlikon in 1967. The former CEO of ASEA, Percy Barnevik ran the company until 1996.
In 1990, ABB purchased Westinghouse's metering and control division (the load control division was spun off to Cannon Technologies in the late 1990s and the meter division was spun off to Elster Electricity in the early 2000s). Also, in the early 1990s, ABB purchased Combustion Engineering (C-E), headquartered in Stamford and Norwalk, Connecticut, a leading U.S. firm in the development of conventional fossil fuel power and nuclear power supply systems to break into the North American market. Klaus Agthe was CEO of the US operation at the time. Continuing with its expansion plans, ABB purchased Elsag Bailey, a process automation group, in 1997 which included Bailey Controls, Hartmann & Braun, and Fischer & Porter. This was the largest acquisition to date in ABB's history.

ABB bought International Combustion Ltd from Rolls-Royce in 1997.

Alstom acquired ABB’s boiler and fossil fuel operations in 2000 while its nuclear business was purchased by Westinghouse Electric Company in 2000. In 2000, ABB also signed a contract for the delivery of equipment and services for two North Korean nuclear power plants to be supplied under an agreement with the Korean Peninsula Energy Development Organization (KEDO), a consortium formed in 1995 by the governments of the United States, Japan, South Korea and the European Union. ABB formally divested from a joint venture named ABB-Alstom Power in 2000, and sold its interest in conventional power generation systems to Alstom Power. ABB's nuclear business was sold to BNFL and merged into Westinghouse Electric Company.

In 2001, ABB was ranked as number one on the Dow Jones corporate sustainability index for the third year in a row.

In 2002, ABB asked Lindahl, the company's former chief executive, to return some of his $50 million retirement pay, which its board called excessive. ABB also asked its former chairman Percy Barnevik to pay back part of his $87 million pension package. The size of the pensions was disclosed at the same time as ABB's $691 million net loss for 2001 made headlines and drew sharp criticism in Switzerland and Sweden.

ABB's Building Systems business unit was sold off in 2004 to Capvis, a Swiss private equity company, as part of ABB's strategy to focus on power and automation technologies. ABB's building systems businesses in Australia and Hong Kong were sold off the year before, in May 2003, to Downer EDI Limited. Building Systems provided services for building facilities encompassing indoor air quality, building automation as well as power distribution and management.

Financial debt and lingering asbestos liability brought ABB to the brink of bankruptcy in the early 2000s. In 2006, ABB recovered financially by settling asbestos issues brought by its U.S. subsidiaries, Combustion Engineering and Lummus Global. In August 2007 Lummus Global was sold to CB&I.
In December 2008, ABB acquired Ber-Mac Electrical and Instrumentation to expand its presence in western Canada's oil and gas industries.

In 2009, ABB realigned its automation divisions. As of January 1, 2010, the business units in the Automation Products and Robotics divisions were regrouped into two new divisions – Discrete Automation and Motion, and Low Voltage Products. The Process Automation division remained unchanged except for the addition of the instrumentation business from the Automation Products division.

In May 2010, ABB acquired software company Ventyx for more than $1 billion from Vista Equity Partners. In 2011, on May 9 ABB announced acquisition of Australian-based Mincom Limited from private equity firm Francisco Partners for an undisclosed sum. On July 29, 2011, acquisition has been finalised. Mincom and Ventyx were subsequently integrated under the Ventyx name, and have now been integrated into ABB as the Enterprise Software Product Group.


**Power Capacitor Manufacturing Unit**

Improving power quality for grid efficiency and reliability

ABB is a leading supplier of solutions that improve the power quality of electrical networks. Based on extensive experience and use of latest technologies, ABB develops and manufactures a comprehensive range of products and solutions. They improve the power quality of electrical networks by eliminating disturbances and improving power factor in line with grid requirements. ABB power quality products and solutions are available for low-voltage (LV), medium-voltage (MV) and high-voltage (HV) systems.

**Why ABB?**

- One stop shop: ABB’s capacitor and filter portfolio consists of capacitors and controllers, shunt reactive power compensation banks with and without reactors, stepped and step-less fast reactive power compensators and passive and harmonic filters for voltage requirements ranging from
208 V to 800 kV, and for a large variety of applications in the commercial, industrial, distribution and transmission utility field. Solutions for both AC and DC applications are available.

- Extensive field experience: ABB has a vast knowledge and experience in capacitor and filter products, and their application in the field. As an ABB customer, you gain access to our vast knowledge and experience, and complete support in the form of analyses, calculations and suggestions on custom solutions.
- Close to you: Our vast global setup enables us to offer expert competence close to you, we will help you identify problems, provide solutions and service your needs.

**ABB Power Capacitor Products**

- **High-voltage capacitors and filters**

Improving the performance, quality and efficiency of electrical systems

In transmission systems, reactive power is needed to maintain the voltage to deliver active power. A lack of reactive power leads to an inefficient use of the electrical network and results in voltage sags, overloaded transformers, lines, cables, etc.

In industry, motor loads and other electrical loads require reactive power to convert electrical energy into useful work.

Our product offering for high-voltage reactive power and filtering applications is shown on this page.

**Why ABB?**

- Access to a comprehensive range of capacitors and filters
- Design for reliable operation in all climates, from the arctic cold to the tropical heat
- Complete support to analyze, calculate and suggest custom solutions
- Vast and very long experience in capacitor and filter products and their application in the field

![Fig. 3 High Voltage Capacitor and Filter (Source: ABB)](source: ABB)
Medium-voltage capacitors and filters

Improving the performance, quality and efficiency of electrical systems

Capacitors are very beneficial in power grids. They provide the reactive power needed by electrical motors, transformers, etc. This increases the transmission capacity and reduces losses thanks to higher power factors. They enable power factor targets of the utilities to be met.

Capacitors are also a key component in various filter solutions that reduce harmonic content. They reduce the risk of disturbances in production processes, metering errors and malfunctioning of relay protections. This extends the service life of connected equipment.

Our product offering for medium-voltage reactive power and filtering applications is shown on this page.

Why ABB?
Both utilities and industry can benefit from ABB capacitors.

- Grid compliance
- Reduction of electricity expenses
- Increase in plant capacity
- Higher productivity
- Enhanced asset utilization
- Lower network losses and CO₂ emissions
- Voltage stability

![Medium Voltage capacitors and Filters](source: ABB)
Improving the performance, quality and efficiency of electrical systems

Power Quality of the low voltage network is an important challenge for today's industrial and commercial applications. Good Power Quality leads to trouble free and efficient operation of installations.

Why ABB?

ABB has a comprehensive portfolio for addressing a wide variety of power quality problems. The benefits of using ABB's LV capacitor and filter solutions include:

- Compliance with the strictest power quality regulations on reactive power and harmonics
- Reducing and/or eliminating utility penalties for a low power factor and/or harmonics
- Off-loading of and reduction of power losses in cables and transformers
- Reducing production downtime and/or commercial system downtime
- Increasing system efficiency and reduction of CO₂ emissions

Motors and generators Unit

ABB offers a comprehensive range of reliable and high efficiency motors and generators for all applications.

ABB has what it takes to help every industry and application reach new levels of efficiency and energy savings even under the most demanding conditions. Combining the best available materials
with superior technology, the electric motors and generators are designed to operate reliably no matter how challenging the process or application, and to have low life cycle costs.

Fig. 6 ABB Ability™ Condition monitoring for digital power train (Source: ABB)

Digital advantage that accelerates efficiency, predictability and safety

The ABB Ability™ Digital Power trains is a suite of digital solutions including devices, software and services. It combines connectivity and data analytics with our expertise to make your operations efficient, predictable and safe.

**ABB Ability™ condition monitoring for power trains**

ABB Ability™ Condition Monitoring for power trains optimizes the performance and efficiency of rotating equipment. It enables full transparency on all parameters for drives, motors, mounted bearings and pumps, and can also be applied to applications such as compressors, conveyors, mixers and extruder main shafts.

**One-stop visualization**

ABB Ability™ Condition Monitoring for power trains provides customers access to a monitoring portal, to view key operational parameters of individual assets as one unified system. Customers can take actions that lead to less down time, extended equipment lifetime, lower costs, safer operations and increased profitability.

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Motor Units

ABB is offering well-proven and pre-engineered motor unit packages that are more cost efficient and much easier to integrate with robots and robot controllers.

Expanded possibilities

ABB is offering standardized motor unit packages complete with cablings, serial measurement board (SMB) box and safety options. The portfolio of six different motor units between 2.5-50 Nm max dynamic torque offers vast possibilities for positioners, track motion rails, indexing conveyers, servo guns and other external axis applications.

Standardized solutions

All motor unit versions are already used in ABB’s range of high-quality positioners and robots, so integrators can rest assured that the motor units are tested and proven parts that are pre-engineered to work perfectly in combination with other ABB equipment.

Easily integrated

The motor unit offer includes CAD models that allow engineers to easily incorporate the motor units into their system designs. These are particularly suited to ABB’s own easy-to-use RobotStudio software, which can support every aspect of a system (e.g., motion control, application design, execution, and communication), as well as RobotWare and RobotWare Arc.

Complete package

The accompanying flexible cables simplify integration of motor units into designs where the motor frequently shifts position, and end customers benefit from the fact that these cables are proven to last much longer.

Global support

With more than 40 years of experience in robotics, ABB has sales and service organizations in 53 countries.
GALLERY

Fig. 7 Dr. Rajashekar P Mandi, Director, School of EEE presenting Memento to Mr. Shailendra Kumar

Fig. 8 Dr. Divakar B.P, Dean, R & I, presenting Memento
Fig. 9 Faculty, School of EEE having an Interactive session

Fig. 10 Faculty Members visiting Motor assembly Unit

Fig. 11 Faculty Members visiting Motor assembly Unit