PROJECT REPORT

STEEL AUTHORITY OF INDIA LIMITED
(A Government of India Enterprise)
DURGAPUR STEEL PLANT
DURGAPUR - 713203

VOCATIONAL TRAINING PROGRAMME, 2016

DURGAPUR STEEL PLANT

INDUSTRIAL COMPUTER SYSTEMS

NAME: Rajat kumar agarwal

COURSE:B.E., 4th YEAR

SEMESTER:7th

DEPARTMENT: INFORMATION TECHNOLOGY

ROLL NO: 111308038

CERTIFICATE

This is to certify that Rajat kumar agarwal, currently pursuing my B.E. in Information Technology at IIEST ,SHIBPUR has successfully completed Vocational Training programme at Durgapur Steel Plant under my supervision from 06.06.2016 to 17.06.2016 and his performance was good.

Gurprit Singh
DGM I/C (C & IT)
Durgapur Steel Plant

Gurprit Singh

Mr. Gurprit Singh
DGM I/C,
C & IT Department,
Durgapur Steel Plant

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ACKNOWLEDGEMENT

I, Rajat kumar agarwal, currently pursuing my B.Tech in Information Technology would like to express my gratitude to Durgapur Steel Plant for giving me the opportunity to complete myVocational Training programme.

I would like to thank 'Mr. Gurprit Singh'- DGM I/C, Computer and Information Technology, Durgapur Steel Plant for making these 2 weeks an interesting learning experience and my fellow trainees for being immensely helpful and making me accustomed to the corporate culture.

INTRODUCTION TO DURGAPUR STEEL PLANT

One of the integrated steel plants of SAIL or Steel Authority of India, Durgapur Steel Plant is a place of immense importance. The plant boasts of being the most significant site in the city. Situated on the banks of the Damodar River, at a distance of about 158 km from Kolkata, Durgapur Steel Plant has its geographical location as 23° 27' N and 88° 29' E. Though not an individual company, the plant is the largest industrial unit in West Bengal. It has played a historical part in the industrial development of India. Apart from extending quality products, the plant also works for maintaining a healthy and clean environment. There are necessary pollution control facilities installed at the plant, for maintaining a healthy environment.

History

Initiated during the 1950s, Durgapur Steel Plant changed the face of India, bringing with it a lot of technical and industrial growth for the country as a whole. The plant was set up with an initial annual capacity of one million tonnes of crude steel per year. However, as time progressed, the capacity of Durgapur Steel Plant (DSP) was later expanded to 1.6 million tonnes in the 1970s. Three decades after its commencement, a massive modernization program was undertaken, which brought a number of technological developments in the plant. The yearly capacity of the plant was also increased to 2.088 million tonnes of hot metal, 1.8 million tonnes crude steel and 1.586 million tonnes saleable steel.

Present Times

Covered under ISO 9001: 2000 quality management system, Durgapur Steel Plant today is extremely well equipped and is stuffed with all the state-of-the-art technology required for quality steel making. With modernization, the plant flaunts improved productivity, improved energy conservation and better quality products. Everything in the steel complex and mills zone, comprising its Blooming & Billet Mill, Merchant Mill, Skelp Mill, Section Mill and Wheel & Axle Plant, have been covered under ISO: 9002 quality assurance certification. The plant also boasts of up-to-date electrical and electronics laboratory, hydraulics and pneumatics laboratory and workshop, for effective training and development of its employees.

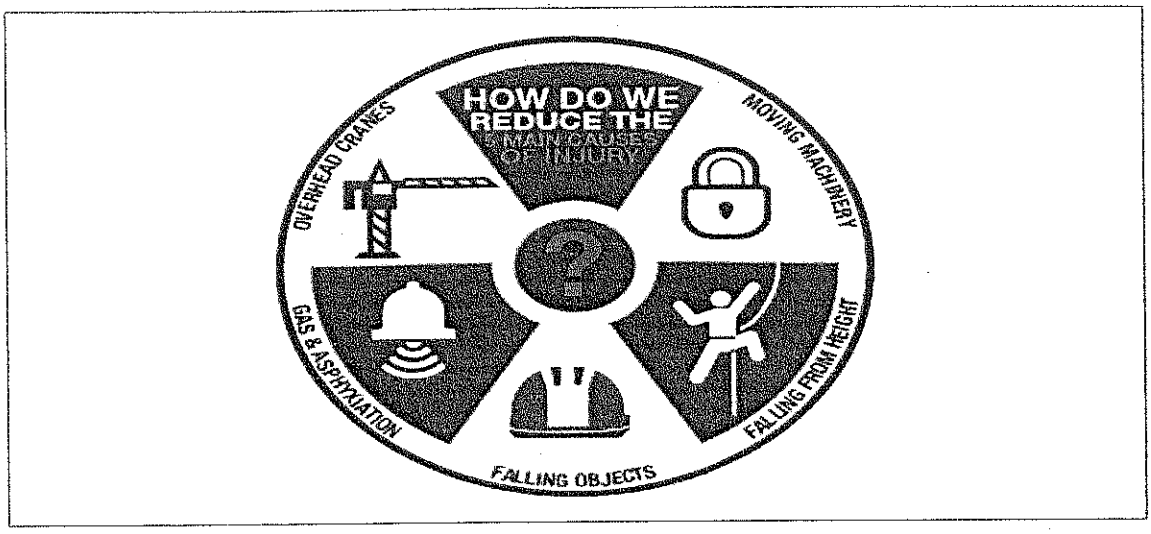
Raw Materials

Talking about raw materials, just like any other steel plant, iron ore, coal and limestone are the three most basic raw materials of Durgapur Steel Plant. The plant draws its coal from the Jharia-Raniganj coal belt, while some amount of prime coking coal, with fairly low ash content, is imported as well. The iron ore, on the other hand, is derived from the mines at Bolani, in Orissa. Lime stone comes from the Birmitrapur (Orissa), Jaisalmer (Rajasthan), and Jukehi and Nandwara (Madhya Pradesh). Durgapur Steel Plant consumes a total of about 7.4 million tonnes of different raw materials annually

The 7.4 million tonnes comprises of over 1.84 million tonnes of coal and 2.9 million tonnes of iron ore lump and fines. Besides this, the plant also requires limestone, dolomite, manganese ore, bauxite, silicomanganese, ferromanganese and ferrosilicon. Coming to handling of raw material, the plant has various facilities that improve and ensure consistency in their quality. Some of them are beneficiation/washing facilities for lump ore and fines, at Bolani; screening of lump iron ore inside the plant; selective crushing of coal at coal handling plant, base blending facilities for sinter plant and silo-cum-blending bunkers.

SAFETY RULES IN A STEEL PLANT

Protecting the safety and health of everyone who works in or around the steel industry is of vital importance to all our members. The duty of care and social responsibility demands that everyone is able to work in a safe and healthy work environment. The World Steel Association (worldsteel) provides up-to-date guidance, data, processes and procedures freely available to members to help the steel industry deliver on its key mission to eliminate accidents and manage working environments with the highest standards of safety and health conditions.



Hazards in Major Shops

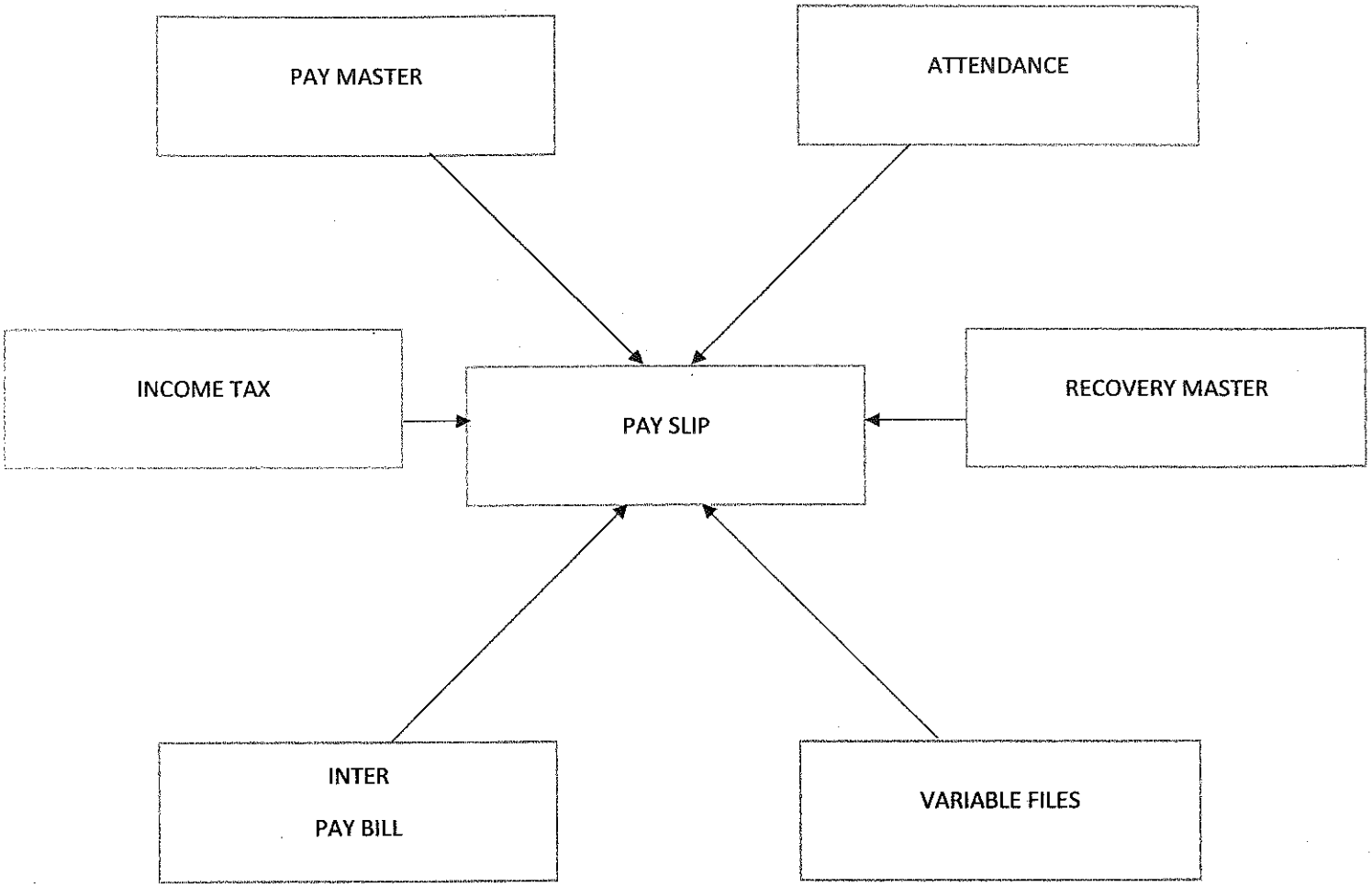
Coke Oven & BPP	:	Heat, Smoke, Dust, Mobile Equipment Chemicals, Fire And Explosion etc.
Blast Furnace	:	Liquid Metal, Gas, Dust, Conveyors, Loco Movement etc.
Steel Melting Shop	:	Liquid Metal, Explosion, Cranes, Other Mobile Equipment etc.
Rolling / Mills	:	Metal Under Rolling, Heat, Splinters, Cobbles, Hydraulics, Cranes etc.
Power Plant	:	Ht Elec. Equipment, Gas Lines, Heat, Dust Noise Vibration etc.
Foundries	:	Heat, Dust, Explosion, Chemicals etc.

PAYROLL SYSTEM

A payroll system is software which organizes all the tasks of employee payment and the filing of employee taxes. These tasks can include keeping tracking of hours, calculating wages, withholding taxes and deductions, printing and delivering checks and payingemployment taxes to the government.Payroll is the sum total of all compensation a business must pay to its employees for a set period of time or on a given date. It is usually managed by the accounting department of a business; small-business payrolls may be handled directly by the owner or an associate. Payroll can also refer to the list of employees of a business and the amount of compensation due to each of them. It is a major expense for most businesses and is almost always deductible as such. Payroll can differ from one pay period to another due to overtime, sick pay and other variables. Companies typically generate their payrolls at regular intervals, for the benefit of regular income to their employees. The regularity of the intervals varies from company to company, and sometimes between job grades within a given company. Common payroll frequencies include: daily, weekly, bi-weekly/fortnightly(once every two weeks), semi-monthly (twice per month), and monthly.[7] Less common payroll frequencies include: 4-weekly (13 times per year), bi-monthly (once every two months), quarterly (once every 13 weeks), semi-annually (twice per year), and annually (yearly).A payroll system involves everything that has to do with the payment of employees and the filing of employment taxes. This includes keeping track of hours, calculating wages, withholding taxes and other deductions, printing and delivering checks and paying employment taxes to the government.

The payroll system used in Durgapur Steel Plant uses a flat file, storing in digits. COBOL is used. Front-end is done in Oracle Forms 6i. Database is stored and manipulated using Oracle Forms 9i. Web applications are used in Perl and PHP. The hardware used is IBM servers P650 Series. Two servers are used in cluster. One is used for emergency purpose. Web application is implemented in AIX 5.0 hardware.

Many medium- and large-sized companies contract outside payroll services to streamline the process. Employers keep track of the number of hours each employee worked and relay this information to the payroll service. On payday, the payroll service calculates the gross amount the employee is owed based on the number of hours or weeks the employee worked during the pay period and his pay rate. The service deducts taxes and other withholdings from earnings, and then provides a direct deposit to the employee's bank account or a paper check.The major benefit of payroll services is their ability to produce a variety of reports that simplify accounting procedures and help companies ensure they are in compliance with legal and tax filing requirements. The payroll service may also maintain a record of how much vacation or personal time employees have used.


PAY MASTER
ATTENDANCE
INCOME TAX
PAY SLIP
RECOVERY MASTER
INTER
PAY BILL
VARIABLE FILES

SYSTEM DBA

Database administration is the function of managing and maintaining database management systems (DBMS) software. Mainstream DBMS software such as Oracle, IBM DB2and Microsoft SQL Server need ongoing management. As such, corporations that use DBMS software often hire specialized IT (Information Technology) personnel calledDatabase Administrators or DBAs.Systems DBAs (also referred to as Physical DBAs, Operations DBAs or Production Support DBAs): focus on the physical aspects of database administration such as DBMS installation, configuration, patching, upgrades, backups, restores, refreshes, performance optimization, maintenance and disaster recovery.A system DBA focuses on technical rather than business issues, primarily in the system administration area. Typical tasks center on the physical installation and performance of the DBMS software and can include the following:

- Installing new DBMS versions and applying maintenance fixes supplied by the DBMS vendor
- Setting and tuning system parameters
- Tuning the operating system, network, and transaction processors to work with the DBMS
- Ensuring appropriate storage for the DBMS
- Enabling the DBMS to work with storage devices and storage management software
- Interfacing with any other technologies required by database applications
- Installing third-party DBA tools

In Durgapur Steel Plant the System DBA is implemented in Slim framework. SAP interfaces are used for report processes. A separate mail server is used using squirrel mail in Durgapur Steel Plant.

System DBAs are rarely involved with actual implementation of databases and applications. They might get involved in application tuning when operating system parameters or complex DBMS parameters need to be altered. A system DBA focuses on technical rather than business issues, primarily in the system administration area. Typical tasks centre on the physical installation and performance of the DBMS software. System DBAs are rarely involved with actual implementation of databases and applications. They might get involved in application tuning when operating system parameters or complex DBMS parameters need to be altered.Indeed, the job of system DBA usually exists only if the organization does not have an official system administration or systems programming department.

ERP

Enterprise resource planning (ERP) is a category of business-management software—typically a suite of integrated applications—that an organization can use to collect, store, manage and interpret data from many business activities.ERP provides an integrated view of core business processes, often in real-time, using common databases maintained by a database management system. ERP systems track business resources—cash, raw materials, production capacity—and the status of business commitments: orders, purchase orders, and payroll. The applications that make up the system share data across various departments (manufacturing, purchasing, sales, accounting, etc.) that provide the data.ERP facilitates information flow between all business functions, and manages connections to outside stakeholders.

Enterprise system software is a multibillion-dollar industry that produces components that support a variety of business functions. IT investments have become the largest category of capital expenditure in United States-based businesses over the pastdecade. Though early ERP systems focused on large enterprises, smaller enterprises increasingly use ERP systems.
The ERP system is considered a vital organizational toolbecause it integrates varied organizational systems and facilitates error-free transactions and production. However, developing an ERP system differs from traditional system development.[4] ERP systems run on a variety of computer hardware and network configurations, typically using adatabase as an information repository.

There are two kinds of ERP systems used in DSP, ERP Commercial and ERP Plant. ERP Commercial is implemented in SAP R3 using ABAP4. ERP Plant is mainly used for maintaining machineries ID, maintenance based on time and performance, job order for a machinery for operations or components and production planning.

An important goal of ERP is to facilitate the flow of information so business decisions can be data-driven. ERP software suites are built to collect and organize data from various levels of an organization to provide management with insight into key performance indicators (KPIs) in real time.ERP software modules can help an organization's administrators monitor and managesupply chain, procurement, inventory, finance, product lifecycle, projects, human resources and other mission-critical components of a business through a series of interconnected executive dashboards. In order for an ERP software deployment to be useful, however, it needs to be integrated with other software systems the organization uses. For this reason, deployment of a new ERP system in-house can involve considerable business process reengineering, employee retraining and back-end information technology (IT) support for database integration, data analytics and ad hocreporting. Legacy ERP systems tend to be architected as large, complex homogeneous systems which do not lend themselves easily to a software-as-a-service (SaaS ERP) delivery model. As more companies begin to store data in the cloud, however, ERP vendors are responding with cloud-based services to perform some functions of ERP -- particularly those relied upon by mobile users. An ERP implementation that uses both on-premises ERP software and cloud ERP services is called two-tiered ERP.

PROCESS

Modern steelmaking processes can be broken into two categories: primary and secondary steelmaking. Primary steelmaking involves converting liquid iron from a blast furnaceand steel scrap into steel via basic oxygen steelmaking or melting scrap steel and/or direct reduced iron (DRI) in an electric arc furnace. Secondary steelmaking involves refining of the crude steel before casting and the various operations are normally carried out in ladles. In secondary metallurgy, alloying agents are added, dissolved gases in the steel are lowered, and inclusions are removed or altered chemically to ensure that high-quality steel is produced after casting.

Basic oxygen steelmaking is a method of primary steelmaking in which carbon-rich molten pig iron is made into steel. Blowing oxygen through molten pig iron lowers the carbon content of the alloy and changes it into steel. The process is known as *basic* due to the chemical nature of the refractories—calcium oxide and magnesium oxide—that line the vessel to withstand the high temperature and corrosive nature of the molten metal and slag in the vessel. The slag chemistry of the process is also controlled to ensure that impurities such as silicon and phosphorus are removed from the metal.

Electric arc furnace steelmaking is the manufacture of steel from scrap or direct reduced iron melted by electric arcs. In an electric arc furnace, a batch of steel ("heat") may be started by loading scrap or direct reduced iron into the furnace, sometimes with a "hot heel" (molten steel from a previous heat). Gas burners may be used to assist with the melt down of the scrap pile in the furnace. As in basic oxygen steelmaking, fluxes are also added to protect the lining of the vessel and help improve the removal of impurities. Electric arc furnace steelmaking typically uses furnaces of capacity around 100 tonnes that produce steel every 40 to 50 minutes for further processing.[6]

By-product gases from the steel making process can be used to generate electricity through the use of reciprocating gas engines.

Secondary steelmaking is most commonly performed in ladles and often referred to as ladle (metallurgy). Some of the operations performed in ladles include de-oxidation (or "killing"), vacuum degassing, alloy addition, inclusion removal, inclusion chemistry modification, de-sulphurisation and homogenisation. It is now common to perform ladle metallurgical operations in gas stirred ladles with electric arc heating in the lid of the furnace. Tight control of ladle metallurgy is associated with producing high grades of steel in which the tolerances in chemistry and consistency are narrow.

To monitor the various processes in Steel making process, the process needs to be monitored. In Durgapur Steel Plant this is done using Fortran.

DATA CENTER

A **data center** is a facility used to house computer systems and associated components, such as telecommunications and storage systems. It generally includes redundant or backup power supplies, redundant data communications connections, environmental controls (e.g., air conditioning, fire suppression) and various security devices. Large data centers are industrial scale operations using as much electricity as a small town.A data center (sometimes spelled *datacenter*) is a centralized repository, either physical or virtual, for the storage, management, and dissemination of data and information organized around a particular body of knowledge or pertaining to a particular business. Data centers are physical or virtual infrastructure used by enterprises to house computer, server and networking systems and components for the company's information technology (IT) needs, which typically involve storing, processing and serving large amounts of mission-critical data to clients in a client/server architecture.

A data center, or datacenter, often requires extensive redundant or backup power supply systems, cooling systems, redundant networking connections and policy-based security systems for running the enterprise's core applications.

Data center management involves ensuring the reliability of both the connections to the data center as well as the mission-critical information contained within the data center's storage. It also entails efficiently placing application workloads on the most cost-effective compute resource available.

The basic characteristics are the same regardless of the size of the data because every company's success invariably depends on smooth software operations – and those have to be safeguarded.

CONCLUSION

This vocational training done in Durgapur Steel Plant gave me some very useful insights of how systems actually work on an industry level. The required knowledge of the working of various subsystems was gained.

The basic overview reveals the important system components,i.e., payroll system, system DBA, ERP, process, network systems and data center. A payroll system is software which organizes all the tasks of employee payment and the filing of employee taxes.A system DBA focuses on technical rather than business issues, primarily in the system administration area. Typical tasks center on the physical installation and performance of the DBMS software. System DBAs are rarely involved with actual implementation of databases and applications.ERP provides an integrated view of core business processes, often in real-time, using common databases maintained by a database management system. ERP systems track business resources—cash, raw materials, production capacity—and the status of business commitments: orders, purchase orders, and payroll.A data center, or datacenter, often requires extensive redundant or backup power supply systems, cooling systems, redundant networking connections and policy-based security systems for running the enterprise's core applications.

All these various processes coordinate and operate in order to carry out various tasks successfully.