INTERNSHIP REPORT

PREPARED FOR

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Letter of Transmittal

January,2004

Dr. Golam Ahmed Faruqui
Assistant Professor of Finance
Department of Business Administration
East West University
Dhaka, Bangladesh.

Dear Sir,

Please find enclosed a report on 'Material Requirement Planning' which is a requirement of the internship course, BUS- 499. I made my best effort to make the report comprehensive and informative.

I enjoyed working on the topic of the report and if there are any queries, I will be available to respond.

Yours Sincerely,

Ruma Paul.
ID#1998-2-10-022

ACKNOWLEDGEMENT

I am thankful to the East West University (EWU) for the opportunity of carrying out this study as part of my BBA course. I am particularly grateful to my supervisor, Dr. Golam Ahmed Faruqui, Assistant Professor of Finance, Department of Business Administration of EWU, for his guidance, understanding and inspiration.

I am especially thankful to the BASF Bangladesh Ltd. For the support during my internship and for giving me the opportunity for gaining practical experience. Without such support I would not have been able to carry out the study. I am grateful to Mr. Satipati Moitra, Finance Director, Mr. Abdul Matin Patwary, FCMA, Mr. Abdul Hakim Bhuiyan Manager of Materials Management of BASF Bangladesh Ltd. For their guidance and support.

Chapter: 1-Introduction:

1.1: Origin of the Report:

This is an internship Report on Material Requirement Planning of BASF Bangladesh limited under the supervision of Mr. Abdul Matin Patwary FCMA, BASF Bangladesh Limited.

The intern was placed in BASF Bangladesh Limited for the three months internship to have practical snatch over the Organization activities & to be familiar with real sense of business and application. The topic of the report is proposed to be Material Requirement Planning (MRP) at BASF Bangladesh Limited would cover a critical analysis of the Company's activities.

1.2: Introduction

Almost in any industry, a huge portion of working capital is invested in the business in the form of inventories. Again, of the different type of inventories Materials occupy the key position in respect of the amount of investment involved in them. The important role played by this element of cost in the total cost structure of a product can be realized only through analysis of total cost of production. Materials as for instance account for as much as 56 to 69 percent, of the products the entire world over.....

Table: Comparison of Material cost as % of total cost among different countries:

➢ USA	59%
➢ UK	61%
➢ JAPAN	56%
➢ ITALY	62%
➢ IRAN	66%
➢ MEXICO	64%
➢ INDIA	66%

Source: S.Venue, Inventory Controls Management, LOK UDYOG Jan 1999 P 1013.

Effective materials planning is essential in order to

In this regard effective materials planning is necessary.

- Provide the best service to customers.
- Produce at maximum efficiency.
- Manage inventories at predetermined levels to stabilize investment in inventories.

Objectives

Without having any defined objective, any effort paid to any matter tends to be ineffective. That is why the core objectives of the report were as follows:

- To define theoretical aspects of Materials Requirement Planning (MRP) system existing at present.
- To make a linkage between theoretical aspect and practical aspect.
- To find out the uses of tools and techniques of MRP system at BASF Limited.
- To find out the importance of proper MRP system.
- To find out the difficulties faced by BASF Bangladesh Limited.
- To find out the ways to triumph over the problems faced by BASF Bangladesh Limited.

1.4: Methodologies:

In the mission the concepts and definitions have been taken by consulting with Mr.Abdul Hakim Bhuiyan FCMA & Mr. Abdul Matin Patwary FCMA and also from different books & Internet. Information about BASF has gathered from primary and secondary sources.
From data collection to conclusion, it has tried to follow methodology .The methodologies that have followed throughout the study stated below:

- **Data selection**: At first, it has tried to identify required data for the study. In order to select the relevant data supervisor's advice was followed.
- **Data Collection**: To collect data both primary and secondary sources have been used and these are:

Primary Sources:

- Official records of BASF.
- Face to face interviews of the executives/ Managers.

Secondary Sources:

- Annual repot of BASF Bangladesh Limited.
- Other published materials of BASF Bangladesh Limited.
- Web site of BASF Bangladesh Limited.

In analysis of information and conclusion, it has tried to compare the information relating to Material Requirement Planning of BASF Bangladesh Limited to theoretical and modern system.

1.5 : Scope:

MRP is a vast field of production/ operations management. The project has covered by

- Theoretical aspects of MRP.
- MRP system adopted at BASF Bangladesh Limited.
- Reason behind deviation and some recommendation for the betterment of MRP.

1.6 : Limitations:

The study as an empirical study, suffered from some limitations, shortcomings, lapses and many others obstacles. However, I have tried to my level best to draw a true and understandable.

The main touchable limitations of the study were as follows:

- Short span of time.
- Non-availability of information.
- Incomplete information.
- Human errors, omissions.

Chapter: 2 : BASF at a glance:

2.1: The Company:

From a manufacturer of the first synthetic dyes in 1865, BASF developed into a leading global chemical company producing a comprehensive range of chemical products. The BASF product range can be divided into 4 major categories:

- Health and nutrition
- Colorant and finishing products
- Chemicals
- Plastics and Fibers

All products are vital components in thousands of everyday products. BASF touches nearly all facets of our daily lives.

BASF Bangladesh Ltd. Is a slim setup with about 50 dedicated staff members. Mr. Ruhul Amin is the Chairman & Managing Director of the company.
BASF Bangladesh Ltd. Strives to become the leading chemical company in the country, which help customers to make their products better. Use of our products, technical expertise with extensive service facilities adds value to their products.

BASF Bangladesh Ltd. Is proud to be actively involved in the economic growth of the country. BASF is committed to bring-in state-of-the art technology into Bangladesh in order to achieve a further development especially in the export-oriented industries.

BASF has been in operation in Bangladesh since pre-independence of the country in the name of BASF Pakistan Ltd. And after independence in 1971 BASF started its operation in the name of BASF Bangladesh Ltd. (BBL) as a subsidiary of BASF Aktiengesellschaft. From the inception till 1985 the activities were concentrated mainly in indenting business. In 1985, a production plant with initial annual capacity to produce 1000 tons of sophisticated textile and leather auxiliaries was installed with the assistance of BASF

Aktiengesellschaft. In the plant, auxiliaries for leather and textile industries are produced in liquid form to substitute import to meet local demand.
Now total output has reached to 2200 m.ton annually and targeted to increase production by 50% by the year 2005. The plant is now located in Tejgaon Industrial Area and in near future BBL will move its production plant in expanded capacity to a much larger space in Rupgonj, Narayangonj.

Besides this, BASF Bangladesh is marketing Agro chemicals through different distribution channels. BBL also sells selected items of pigments, chemical and auxiliaries ex stock. In addition to the head office In Dhaka, BBL maintains regional office in Chittagong port city.

The yearly average turnover is Euro 40 million and roughly one-fifth of the sales performance comes from local production and the rest comes from indenting and importation of products like Pigments, Auxiliaries, Crop Protection Agents, Pharmaceuticals, Plastics, Printing Ink & Plates, Intermediates, Colorants etc. from BASF group companies and third party suppliers.
Total business is operated by two major divisions, which are

- E Division
- Chemicals & Plastics Division

Legal Ownership Structure:

BASF Bangladesh Limited (a subsidiary of BASF Aktiengesellschaft of Germany) is a private limited company, incorporated in Bangladesh with an authorized capital of Tk. 20,000,000 divided into 2,000,000 ordinary shares of Tk 10 each.
The issued and paid up capital is TK. 12,275,840 that is held by:

Foreign shareholders, BASF Aktiengesellschaft of Germany	76.41%
Bangladeshi share holders	23.59%

2.2 VISIONS 2015 of BASF Bangladesh Limited:

- We are a reputed and result-oriented transnational company in Bangladesh. We are the number 1 chemical company in the country.
- Our basic strength is state-of-the art technology. Our products meet rigorous standards determined by our parent company.
- We strive our best for achieving excellence in each step in production, marketing, distribution and technical support in order to ensure highest customer-satisfaction.
- A high return on equity is our cherished goal.
- Our strength is a well-trained, highly qualified and dedicated workforce who cares for highest values

We, the employees of BASF Group, are committed to the following values:

Sustainable Profitable Performance:

Ongoing profitable performance in the sense of Sustainable Development is the basic requirement for all of our activities. We are committed to the interests of our customers, shareholders and employees and assume responsibility towards society.

Innovation in the Service to Our Customers:

We are committed to customer satisfaction. We develop products and chemical processes and provide services of high scientific and technical levels to foster good partnerships with our customers.

Safety, Health, Environmental Responsibility:

We act in a responsible manner and support the Responsible Care © initiatives. Economic considerations do not take priority over safety and health issues and environmental protection.

Intercultural Competence

We foster intercultural diversity within the BASF Group and work together as a team. Intercultural competence is our advantage in the global competition.

2.3: Location of the Company:

Head Office Dhaka

Address:

H.R. Bhaban (4th Floor),

26/1, Kakrail Road, Kakrail Road, Dhaka

Tel: 880 2 9348374-76, 880 2 8313479

Fax: 880 2 8313599

E-mail: shamsuak@basf-bangladesh.com

Branch Office Chittagong

Address:

Miazi Villa, 1126/A East Nasirabad,

CDA Avenue, P.O. Box 734,

Chittagong.

Tel: 880 31 651256, 880 31 651706

Fax: 880 31 653216

Factory Dhaka

Address:

113-C Tejgaon Industrial Area, Dhaka

Tel: 880 2 9898472

Fax: 880 2 8813767

2.4: BASF Group Investor Relations Strategy

Growth and Innovation:

Our goal is to increase and sustain our corporate value through growth and innovation. We base our activities on our corporate guidelines - our Values and Principles - as well as on the principles of Sustainable Development.

Important elements of our strategy are:

- Expanding highly profitable businesses
- Enhancing our long-term competitiveness
- Creating value for our customers and for BASF Investing in growth markets
- Relying on the diverse skills of our employees.

Expanding highly profitable businesses:

We optimize our product portfolio by expanding highly profitable business activities and concentrating on our core competencies. As well as growing organically through innovation and capital expenditures, we operate a strategy of active portfolio management. This means that we acquire innovative businesses with a high potential for growth and discontinue business activities that are unlikely to show long-term profitability as part of the product portfolio. Between 1993 and 2002, we divested businesses corresponding to approximately one-third of the acquired new future-oriented businesses with about the same amount of sales. In production, we also enter into strategic alliances with strong partners with the aim of achieving profitable growth in our key businesses and value-adding chains.

Enhancing our long-term competitiveness :

Cost leadership is crucial to our long-term competitiveness. To achieve this, we use the cost efficiency offered by integrated large-scale plants as well as technological progress in our production processes. In doing so, our Verbund is our greatest strength.

We use the technology platforms in our research and development units to implement process and product innovations effectively. Our Know-how Verbund is effectively supplemented by some 1,000 research cooperations.

Our goal is to operate the most competitive sites in the chemical industry. We believe that to secure our long-term performance in the chemicals business we must optimize and extend our Verbund and consolidate our portfolio of production sites. We use the cost advantages of our Verbund and, where appropriate, expand it - either by building new plants at existing sites or by building new Verbund sites such as those in Nanjing, China, and Kuantan, Malaysia. At our Ludwigshafen site, we aim to reduce costs by EUR 450 million as part of the Ludwigshafen Site Concept. To this end, we have introduced a series of optimization measures for raw materials, energy consumption, processes and personnel at our most important Verbund site in Ludwigshafen, Germany.
We operate regional and local sites where this offers a competitive advantage.
Our competence in marketing and sales and our access to competitively priced raw materials, energy and precursors are further aspects of our strategy. Where necessary, we ensure access by using our technological and market strength to enter into partnerships and alliances with strong global or regional partners.

Creating value for our customers and for BASF:

We aim to become a preferred partner through cooperation with key customers. In response to growing pressures in the commodities business, we are turning to modern e-commerce solutions to contain costs. In our non-commodities businesses, we are expanding the scope of our customer services. Here, our goal is to create benefit for our customers.

Through new sales strategies, we are optimally positioning ourselves to meet the needs of customers who require smaller volumes and less advice. Eight new trading centers have started sales activities for specialty chemicals targeted at such customers in Western Europe.

We enter into cooperative research and development agreements with many innovative customers. We make our customers part of our Know-how Verbund and turn their needs into customized solutions. This gives us an advantage over our competitors and enhances our earnings potential through new products and services.

Investing in growth markets:

We focus our resources on expanding selected businesses in specific regions. Building local production capacities in growth markets is a crucial element of our strategy, as it allows us to supply regional markets locally. At the same time, producing locally also increases the company's flexibility in high-growth markets and reduces the risks posed by temporary currency fluctuations and weak regional growth.

We anticipate that the Asian chemical markets - with the exception of Japan - will grow very strongly in the coming years and are likely to be as large as the European chemical market by 2010. Therefore, Asia is a key market for us. We are positioning ourselves as a major chemical manufacturer in this emerging market. In Europe and North America, we are concentrating our resources and using growth potential in businesses in which we have competitive advantages over other chemical producers.

Relying on the diverse skills of our employees:

Committed and skilled employees are a key to our success. We value the national and cultural diversity of our employees and consider their skills to be a valuable asset. This is particularly the case in our research and development activities, which benefit from the efficient collaboration between a variety of talents and disciplines.

The market-oriented organization introduced in 2001 is making an impact: It brings us closer to our customers, strengthens our market presence and fosters a spirit of entrepreneurship within the company.

Respect and Dialogue:

We treat everyone fairly and with respect. We pursue an open and trusting dialogue within our company, with our business partners and relevant groups in society. We

encourage our employees to be creative and to make full use of their potential for the common success of the company.

Integrity:

We act in accordance with our words and values. We respect the laws and good business practices of the countries in which we operate.

2.5: Description of BASF Businesses and Products:

The operations of BASF Bangladesh Ltd. are mainly divided into two Divisions. The "E. Division" comprises of :

- Textile Colorants, Auxiliaries & Finishing Agents
- Leather Process Chemicals & Finishing Agents
- Paints and Specialty Chemicals activities.
- The "E Division" is headed by Mr. Tariqul Islam and this division provides roughly 50% of company's sales performance.

- EV - Leather
- EV Textile

EV – Leather:

BASF is one of the world leaders in leather processing chemicals. We have wide range of products starting from beam house to finishing operation. BASF Research & Development team is continuously working on development of products and application process. Environmental protection and industrial safety are integral part of our quality policy. For this reason, we are devoting intensive efforts to improving the ecological and toxicological properties of our products for leather processing. This is our contribution towards protecting the environment and improving the quality of life.

Considering the growing market trend, BASF has increased its activities in Asia. Our regional head quarter, Singapore is monitoring daily activities very closely in order to improve the services to meet customers need. BASF regional technical team is now within your reach. The world is becoming smaller due to revolutionary changes in

information technology. Today BASF is in a position to render the services from all over the world in a short notice. Cost effectiveness is our prime consideration. We provide market oriented technical services to meet the requirement of international market. Please knock us to get brilliant solution of your problems.

Appended below is a list of products with brief information:

BEAM HOUSE	
Eusapow	soaking agent
Mollescal	auxiliaries for liming,
Decaltal	deliming agent
Basozym	bating agent
Neutrigan	basifying agent

TANNING:	
Chromitan	chrome tanning agent
Lutan	aluminium complex tanning agent
Implenal	tanning auxiliaries
RETANNAGE:	
Basyntan	synthetic tanning agent
Relugan	polymer tanning agent, aldehyde tanning agent
Tamol	neutralizing agent, dyeing and tanning auxiliaries

DYEING:	
Luganil	BASF is the first introducer of salt free Luganil and
Lurazol	Lurazol powder and liquid drum dyes in the market.

FUR DYES:

Ursol	World class dyes for fur dyeing
Lurajol	

FATLIQUORING:

Lipoderm	we produced world class Fatliquoring agents like
Lipamin	Lipoderm liquor SC, SAF, FP, WF,FANS,FA-CS

WATER REPELLENT TREATMENT:

Densodrin	water repellent with high class performance
Densotan	neutralising & water repellent

FINISHING:

Eukesolar	spray dyes
Bilacryl	cationic spray dyes.
Lepton	Colours pigment preparations
Corial	binders, lacquers, lacquers emulsion
Astacin	PU binders, top & auxiliaries
Luron	casein binders & auxiliaries
Lepton	binders, waxes fillers and auxiliaries
Nevsol	Cationic compoun

EV Textile

EV-Textile is the biggest segment of "E. Division" and these dates back to the earliest operation of BASF.

Being a reputed traditional company, BASF has high image in Bangladesh. Specially in textile sector BASF activities have further expanded in recent years. We offer wide range of colorants & chemicals and render technical services to meet the requirement of export oriented textile mills. Our outstanding quality products are the result of

continuous research & development. BASF has highly qualified and long experienced global and regional technical team to render latest technical service.

Our support and product ranges from the very pretreatment through latest finishing of textile fabrics.

We have a comprehensive product range from simple application to high process reliability in textile process. Brief product information in detailed hereafter.

PIGMENT :

Helizarin®high quality pigments for solvent free, low-solvent and high solvent printing

PRETREATMENT :

Kieralon®wetting and washing agentsLeophen® Nekanil® wetting agentsPrestogen®stabilizers for peroxide bleachingTrilon®sequestering agentsLufibrol®scouring/extracting agentsLusynton® SEneutral demineralisation agentBlankit®reductive bleaching auxiliaries

TEXTILE AUXILIARIES :

WeavingSize CAsizing agent for cellulose fibre finishing agent

AUXILIARIES FOR TEXTILE DYEING:

Hydrosulfite Conc. BASF reducing agentsDekol®. Setamol® Uniperol®dispersing agents & protective colloids Primasol®padding auxiliariesEulysin®pH regulatorsLudigol®oxidizing auxiliaryPrimasol® JETcrease inhibitorsDekol® Trilon®sequestering agents

PRINTING AUXILIARIES :

BASF Reactive Resist Agent resist agentLudigoloxidizing agentLuprintol®emulsifier for pigment printing Lutexal®printing thickenerHelizarin Binderbinder for pigment printing Luprimol®handle modifierLubasin® adhesive

OPTICAL BRIGHTENING :

Ultraphor®optical brighteners for PES/PA and blends. FINISHINGFixapret® Kaurit®crosslinking resinsCondensol®catalysts for resin finishingPerapret®handle modifiersBasosoft® Siligen®softenersPersistol® Ramasit®water repellent agents.

EF-1: Colorants:

In the field of decorative colors BASF has its strong foothold since hundred years. BASF is the source of superior colors, pigments, and dyes with the highest fastness properties for

Surface Coatings (Paints), OEM Coatings, Coil Coatings, Powder, and Coating etc.
Printing Inks
Plastics
Soaps, Detergents etc
Ball-point pen Inks
Colors for seed dressing
Oil colors
ED: Dispersions

BASF-Dispersions have a wide range of products with variety of application fields & renowned producer & supplier of Acrylic polymer dispersions.

For water based paint systems BASF's Acrylic emulsion provides the best quality with reproducibility. Its pure Acrylic and Styrene Acrylic Copolymer provide best binding capacity with economic feasibility.

For economic water based paints, Styrene/Acrylic Copolymer gives the best scrub cycles at a higher PVC which make our Acronal 296D superior to all Vinyl/Acrylic & PVA emulsions in the respect to quality and price.

In the field of no woven binder, e.g. high loft wadding (Padding), Carpets, Medical & Hygiene products, BASF has its Acrylic emulsions with best quality. In the padding industries, BASF Acrylic resins provide high resilience, wash fastness, dry cleaning

resistance etc. In these fields BASF dispersion 'Acronal' and 'Styrofan' stands for its quality throughout the world.

Besides, BASF dispersions has products with proven quality in the field of Adhesives, laminations, tapes, paint additives, paper process chemicals, paper coating chemicals and also a wide variety of monomers.

ES - Specialty Chemicals:

BASF specialty chemicals include a wide range of products with variety of fields of applications, surfactants, emulsifiers, waxes, wax emulsions, PEG, EDTA compounds, de-emulsifiers, corrosion inhibitors, electroplating chemicals, products for metal polishing & pretreatment etc. have made its field larger e.g.

- Detergents
- Soaps
- Toiletries
- Polishes & cleaners
- Metal polishes & electroplating
- and many other chemical and allied industries.

2.6: E-Commerce in BASF :

At BASF, we regard e-Commerce as the execution of business processes by electronic means. Here e-Commerce solutions can extend throughout the entire value added chain, from procurement to sales. E-Commerce solutions are not stand-alone elements, but are rather derived from business strategy. EDI, Internet, intranet and extranet are available as technical tools. E-Commerce opens new perspectives in communication. Business processes are optimized; information is made available instantly using the Internet as a communication medium for performing business processes. This involves public and private networks serving as a basis for information, interaction, transaction and integration among the business partners.

E-Commerce strategies:

We have several strategies, for example System-to-System Solutions, which over the next few years will continue to account for the largest share of marketing through

electronic channels. The term 'System-to-System Solution' refers to a direct connection between business partners' information technology systems (IT).

The second area covers business transactions in the company's own electronic marketplaces as well as in marketplaces operated by other companies. Examples for projects in which BASF participates: Capital interest in ChemConnect in the USA, the global joint venture cc-markets and the online chemicals marketplace ELEMICA, in which BASF is one of a total of eight founding members.

Furthermore, BASF is setting up its own specific procurement marketplaces. The third area concerns online commerce with products and services of individual companies in the chemical industry via WorldAccount and BusinessPortals.

Some Frequently Asked question About e-Commerce of BASF:

- **E-Commerce activities in 2001 and what do you plan for 2002**?

The already existing offer of e-Commerce functionalities at BASF will be continuously improved. With the "go live" of World Account - the worldwide standardized and integrated web portal - the e-Commerce team has achieved an outstanding success in 2001. Currently, worldwide about 3.000 customers are using this state-of-the-art technology, in order to buy BASF products online, to check order status, to get product information or to take part in auctions. In 2002, World Account will be continuously extended and improved. Also further business portals will be integrated within WorldAccount. In the area of system integration, BASF currently supports 130 direct connections to its customers which means a data exchange of about 100.000 news per month. These connections will be extended, too. In 2001, the marketplace activities with BASF participation, Omnexus and Elemica, went live in Europe and in the US. Data connections with several partners have been realized as well. Our initiative to further develop the XML standard of the chemical industry, the Chemical e-Standards, will intensify in several panels. To sum up, in 2002 our focus will be again on e-Commerce solutions that offer a significant added value to our customers.

- **How High Is Your Investment Budget for These Projects?**

All investments in e-Commerce are constantly being adjusted to conform to actual requirements. In the year 2000 the overall budget for e-Commerce activities in the B2B sector was set at 75 million € through the year 2002.

- **Use of the Internet to Maintain Contact with Universities and Research Partners?**

BASF currently cooperates with 866 research partners around the world (universities, independent research institutes, other companies). One third of these partners are located in foreign countries. BASF communicates with all partners via e-Mail.

Since the beginning of 2000, BASF has been the coordinator of an Internet platform called NUHEAL (Neutraceuticals for a Healthier Life) as part of a special EU research project. Here approximately 12 companies and research facilities (universities and independent institutes) cooperatively pursue the development, testing and formulation of nutritional supplements and their application to foodstuffs.

Another Internet research network is SPIN (Solid Particles Industrial Network) for solid particles research. 12 industry players have joined to exchange research results and topical ideas, to identify research deficits and define research projects.

Further expansion and intensification of research activities in the Internet is presently being planned.

- **How Do I Get a User Name and a Password for the Extranet?**

In order to receive limited access to the extranet area you will need a user name and a password. Please contact your personal representative at the sales unit responsible for your deliveries or send us an e-mail and we will put you in touch with the responsible sales unit. After completion of the certification process your contact person will then give you your user name and password.

- **Do I Already Have to Be a BASF Customer?**

We are of course glad to welcome you as a new customer. Use the e-Mail form found under "Contact" to initiate the certification process.

- **Will I Need a Special Browser to View the Internet Pages?**

Internet Explorer 4.07 and Netscape 4.06 and newer versions are supported. The options "Enable Java-Script" and "Accept cookies" must be activated. Older versions such as IE 3.0 are partially supported.

- **What Security Standards Apply to e-Commerce Activities at BASF?**

Of course, all of the data protection measures commonly encountered also applies here. Your data is used within BASF only and is only made available to companies offering their products and services in the portal, but to no other third parties. At the same time all necessary technical security measures are taken such as a firewall and encryption with Secure Socket Layer (SSL). If extranet applications remain idle for more than 30 minutes, they are automatically closed and can only be restarted by logging in again with user name and password. BASF has a security certification. This certificate is displayed to you the first time you enter the extranet.

2.7: Key Success factor of BASF Bangladesh Limited (KSFs):

An industry's key success factors (**KSFs**) are those thinks that most effect industry members' ability to prosper in the marketplace- the particular strategy elements, product attributes, resource, competencies, competitive capabilities, and business outcomes that spell the difference between profit and loss and, ultimately, between competitive success or failure. KSFs by their very nature are so important that all firms in the industry must pay close attention to them—they are the prerequisites for industry success or, to put it another way, KSFs are the rules that shape whether a company will be financially and competitively successful. The answers to three question help identify an industry's key success factors:

- On what basis do customers choose between the competing brand of seller? What product attributes are crucial?
- What resources and competitive capabilities does a seller need to have to be competitively successful?
- What does it take sellers to achieve a sustainable competitive advantage?

On the light of experience and study of company's strategy policies, procedures, that tuned me to draw the following KSFs of BASF Bangladesh Limited.

Technology-related KSFs:

- Scientific research expertise
- Technical capability to make innovative improvements in production processes
- Product innovation capability
- Expertise in a given technology
- Capability to use the internet for all kinds of e-commerce activities

Manufacturing-related KSFs:

- Low-cost production efficiency
- Quality of manufacture
- High utilization of fixed assets
- Low-cost plant locations
- Access to adequate supplies of skilled labor
- High labor productivity
- Low-cost product design and engineering
- Ability to manufacture or assemble products that are customized to buyer specifications

Distribution-related KSFs:

- A strong network of wholesale distributors/dealers
- Gaining ample space on retailer shelves
- Having company-owned retailer outlets
- Low distribution costs
- Accurate filling of customer orders
- Short delivery times

Marketing-related KSFs:

- Fast, accurate technical assistance
- Courteous customer service
- Accurate filling of buyer order
- Breadth of product line and product selection
- Merchandising skills
- Attractive styling or packaging

- Customer guarantees and warranties

Skills-related KSFs:

- Superior workforce talent
- Quality control know-how
- Design expertise
- Expertise in a particular technology
- An ability to develop innovative products and product improvements
- An ability to get newly conceived products past the R&D phase and out into the market very quickly

Organizational capability:

- Superior information systems
- Ability to respond quickly to shifting market conditions
- Superior ability to employ the internet and other aspects of electronic commerce to conduct business
- Managerial experience

Other types of KSFs:

- Favorable image or reputation with buyers
- Overall low cost
- Convenient Locations
- Pleasant, Courteous employees in all customer contract positions
- Access to financial capital
- Patent protection

Chapter : 3 Theoretical aspect of MRP:

MATERIAL REQUIREMENT PLANNING (MRP):

Material requirement planning is not only a technique for planning i§materiali¨ requirements. In addition, logic relates all the activities in a company to customer demands. People can manage all the resources in a company by using MRP logic together with data processing in other areas. This entire system is called a Manufacturing Resources Planning System, or MRP II. With the introduction of technological enhancements such as open systems platforms and client/server architecture, MRP II systems are now evolving into Enterprise Resource Planning Systems (ERP). An ERP system plans not only the allocation of manufacturing resources but also other resources, and has applications in service as well as manufacturing industries. In this book, we concentrate our discussion on manufacturing.

Nature of Demands:

All systems are implemented to satisfy customersi¦ demand. There are different sources of demand for a product and its component items. Some item requirements are determined by the needs of other items while customers specify others. The former requirements also come from customers, but indirectly. Item requirements can be classified as dependent and independent demands.

Independent demand:

Demand for an item that is unrelated to the demand for other items. Demand for finished goods, parts required for destructive testing, and service part requirements are examples of independent demand.

Dependent demand:

Demand that is directly related to or derived from the bill of material structure for other items or products. Such demands are calculated and need not be forecasted.

A given inventory item may have both dependent and independent demand at any given time. For example, a part may simultaneously be used as a component of an assembly and sold as a service part. Production to meet dependent demand should be scheduled so as to explicitly recognize its linkage to production intended to meet independent demand.

MRP Input Data:

MRP is to translate the requirement of products stated in MPS into the requirement of components and materials. MPS is the most direct input to MRP. Other input data include inventory status, bill of material (BOM), fundamental data in item master file, and shop calendar.

MPS:

MPS is the schedule for end items. It states the quantity and timing of production of specific end items. Master production scheduling is a procedure to determine

the production schedules and the available-to-promise (ATP) of the end products. Based on MPS, MRP calculates the replenishment plans from the items in the level below the end products down to the raw materials

BOM:

BOM describes the structure of the products. It states, from level to level, the components needed to make the parent items. By using BOM, the requirements of end products are expanded to include the requirements of the components, and hence the requirements of all the lower level materials.

Inventory Status:

In expanding the lower level requirements, what we obtain are gross requirements. Gross requirement is not the real requirement. Net requirement is calculated by subtracting the inventory from the gross requirement. Since MRP is time-phased, both on-hand and on-order inventories are considered. On-hand inventory is the present inventory; on-order inventory is the future inventory, and has to be represented by both quantity and receiving date.

Fundamental data in item master file:

The attributes of all items including raw materials, works-in-process, semi-finished goods, or finished goods, are expressed in the item master file. The MRP processing requires part number, lead-time, safety stock, lot-sizing rule, low-level code, etc. Low-level code is used to decide the sequence of MRP calculation. Safety stock and lot-sizing rule are used to decide the quantity of the material replenishments. Lead-time is used to decide the time to replenish the required materials.

Shop Calendar:

MRP systems are time-phased. Time bucket is an interval used to break time into discrete chunks. The length of a time bucket is defined according to the characteristics of a business. Commonly used time bucket includes week and day, i.e., numbered-week calendar (00-99) and numbered-day calendar (M-day

calendar, 000-999). Planning horizon is the amount of time the master schedule and MRP extend into the future. The planning horizon should cover at least the cumulative lead-time to produce a product.

Integrity of MRP Input Data:

Data integrity means completeness, timeliness and accuracy. Input data should be provided by related people or machine in time and accurately. If required data is not entered into the system properly, MRP will produce nothing but garbage. MRP is supposed to provide users with credible data but errors destroy the credibility and turn the MRP into a More Ridiculous Plan.

Discipline, attitude and training are the keys to data integrity. Education of employees is the most important factor. Information or data processing auditing must occur regularly to keep the data valid. Management must accept the responsibility for the training, discipline and motivation of everyone who handles data. All the employees handling data must assume responsibility for quality of data handled.

The objective of data integrity is to find and eliminate the causes of errors. Companies using MRP/ERP systems should incorporate auditing, self-checking and self-correcting features into the systems.

Automatic data integrity checks of input data include existence test (e.g. part number, transaction code), reasonableness test (e.g. abnormal quantity or unit-of-measure), diagnostic test (e.g. prior transactions required), internal detection (e.g. negative inventory balances), and purging residences of undetected errors (e.g. closing out old shop or purchase orders)

MRP Procedure:

MPS procedure consolidates the independent demands of forecasts and customer orders to determine the requirements of the products in each time bucket in the planning horizon. After netting the on-hand and on-order inventory, and offsetting the lead-time, the production schedule of the products, MPS, is

determined. In MPS procedure, the available-to-promise (ATP) is also determined. MPS is then fed into the MRP procedure to determine the requirements of the lower level components and raw materials.

The gross requirements of components are determined by calculating the planned order releases (POR) of the parents via single level BOM explosion. The net requirements are calculated by subtracting the on-hand inventory and scheduled receipts (on-order) in each time bucket. After the consideration of lot-size, the net requirements are transformed into the planned order receipts. Planned order receipts appear in every period. Lead-time offsetting shifts the planned order receipts backward and derives the POR which are the MRP result of current item. The MRP procedure continues to explode the POR to obtain the gross requirements of its components. The MRP repeat the procedure until the POR of all the items are determined. The flow chart of the MRP procedure is described in Figure 3.

The net requirement in a period is determined in MRP procedure by the following formula,

Net requirement = Gross requirement iV Available inventory

The available inventory for the first period is

Available inventory = on hand inventory + Scheduled receipts of the first period iV Allocations iV Backorders iV Safety stock.

And, for the other periods

Available inventory = Projected available balance at the end of last period + Scheduled receipts of the current period

If the calculated net requirement is positive, then it is the net requirement of that item in that period. In this case, the projected on-hand balance at the end of that period is less than the safety stock, and the projected available balance is

the projected on-hand balance plus the planned order receipt in that period. If the calculated net requirement is negative, then it is the projected available balance at the end of that period.

MATERIAL REQUIREMENT PLANNING A CLOSER LOOK.

Suppose there are two products, X and Y, and the item master, BOM and MPS files are shown in Table 1, 2 and 3, respectively.

Table 1: Item Master

Part No.	Safety Stock	Lot Size	Lead Time	Safety Time
X	150	400	1	0
Y	100	180	1	0
A	0	180	2	0
B	0	800	2	0
1	0	800	3	0
2	0	400	2	0
3	0	600	2	0

Table 2: BOM file

Parent Part No.	Component Part No.	Qty-Per
X	B	2
X	1	1
B	2	0.25
Y	A	1
Y	1	1
A	B	1
A	3	1

Table 3: MPS file

Prd	1	2	3	4	5	6	7	8	9	10	11	12
X	100	400	300	200	100	200	300	100	100	400	300	200
Y	100	200	100	200	100	200	100	200	100	200	100	200

From BOM file, the system determines the low-level code (LLC) as shown in table 4.

Table 4: Low Level Code

Part No.	Low-Level-Code
X	0
Y	0
A	1
B	2
1	1
2	3
3	2

The calculation sequence of MRP is in ascendant LLC. The MRP report is shown in Table 5.

Table 5a: MRP Report

P_No. =X	Past	OH=	200	LT=	1	SS=	150	AL=	0	LS=	400	ST=	0
Periods	Due	1	2	3	4	5	6	7	8	9	10	11	12
Indep. D.		100	400	300	200	100	200	300	100	100	400	300	200
Gross R.	150	250	400	300	200	100	200	300	100	100	400	300	200
SR	100	400											
POH		450	50	150	-50	250	50	150	50	350	-50	50	250
PAB		450	450	150	350	250	450	150	450	350	350	450	250
Net R.		0	100	0	200	0	100	0	100	0	200	100	0
PO Rcpt.		0	400	0	400	0	400	0	400	0	400	400	0
POR	0	400	0	400	0	400	0	400	0	400	400	0	0

Table 5b: MRP Report

P_No. =Y	Past	OH=	180	LT=	1	SS=	100	AL=	0	LS=	180	ST=	0
Periods	Due	1	2	3	4	5	6	7	8	9	10	11	12
Indep. D.		100	200	100	200	100	200	100	200	100	200	100	200
Gross R.	-100	100	200	100	200	100	200	100	200	100	200	100	200
SR	-50	180											
POH		210	10	90	70	150	-50	30	10	90	70	150	-50
PAB		210	190	270	250	150	130	210	190	270	250	150	130
Net R.		0	90	10	30	0	150	70	90	10	30	0	150
PO Rcpt.		0	180	180	180	0	180	180	180	180	180	0	180

POR	0	180	180	180	0	180	180	180	180	180	0	180	0

Table 5c: MRP Report

P_No.=A	Past	OH=	180	LT=	2	SS=	0	AL=	180	LS=	180	ST=	0
Periods	Due	1	2	3	4	5	6	7	8	9	10	11	12
Indep. D.													
Gross R.	0	180	180	180	0	180	180	180	180	180	0	180	0
SR	0	180											
POH		0	-180	-180	0	-180	-180	-180	-180	-180	0	-180	0
PAB		0	0	0	0	0	0	0	0	0	0	0	0
Net R.		0	180	180	0	180	180	180	180	180	0	180	0
PO Rcpt.		0	180	180	0	180	180	180	180	180	0	180	0
POR	180	180	0	180	180	180	180	180	0	180	0	0	0

Table 5d: MRP Report

P_N0.=1	Past	OH=	500	LT=	3	SS=	0	AL=	50	LS=	800	ST=	0
Periods	Due	1	2	3	4	5	6	7	8	9	10	11	12
Indep. D.		10	10	10	10	10	10	10	10	10	10	10	10
Gross R.	300	890	190	590	10	590	190	590	190	590	410	190	10
SR	-200	800											
POH		160	-30	180	170	-420	190	-400	210	-380	10	-180	610
PAB		160	770	180	170	380	190	400	210	420	10	620	610
Net R.		0	30	0	0	420	0	400	0	380	0	180	0
PO Rcpt.		0	800	0	0	800	0	800	0	800	0	800	0
POR	800	0	800	0	800	0	800	0	800	0	0	0	0

Table 5e: MRP Report

P_No.=B	Past	OH=	400	LT=	2	SS=	0	AL=	100	LS=	800	ST=	0
Periods	Due	1	2	3	4	5	6	7	8	9	10	11	12
Indep. D.													
Gross R.	250	1230	0	980	180	980	180	980	0	980	800	0	0
SR	100	800	800										
POH		-30	1570	590	410	-570	50	-930	0	-980	-800	0	0
PAB		770	1570	590	410	230	50	0	0	0	0	0	0
Net R.		30	0	0	0	570	0	930	0	980	800	0	0
PO Rcpt.		800	0	0	0	800	0	930	0	980	800	0	0
POR	800	0	0	800	0	930	0	980	800	0	0	0	0

Table 5f: MRP Report

P_No. =3	Past	OH=	100	LT=	2	SS=	0	AL=	600	LS=	600	ST=	0
Periods	Due	1	2	3	4	5	6	7	8	9	10	11	12
Indep. D.													
Gross R.	0	180	0	180	180	180	180	180	0	180	0	0	0
SR	0	600											
POH		-80	520	340	160	-20	400	220	220	40	40	40	40
PAB		520	520	340	160	580	400	220	220	40	40	40	40
Net R.		80	0	0	0	20	0	0	0	0	0	0	0
PO Rcpt.		600	0	0	0	600	0	0	0	0	0	0	0
POR	600	0	0	600	0	0	0	0	0	0	0	0	0

Table 5g: MRP Report

P_No. =2	Past	OH=	0	LT=	2	SS=	0	AL=	0	LS=	400	ST=	0
Periods	Due	1	2	3	4	5	6	7	8	9	10	11	12
Indep. D.													
Gross R.	0	0	0	200	0	232.5	0	245	200	0	0	0	0
SR	0	400											
POH		400	400	200	200	-32.5	367.5	122.5	-77.5	322.5	322.5	322.5	323
PAB		400	400	200	200	367.5	367.5	122.5	322.5	322.5	322.5	322.5	323
Net R.		0	0	0	0	32.5	0	0	77.5	0	0	0	0
PO Rcpt.		0	0	0	0	400	0	0	400	0	0	0	0
POR	0	0	0	400	0	0	400	0	0	0	0	0	0

In the above MRP tables, allocation, safety time, past due, projected on hand (POH), and projected available balance (PAB), require further explanation.

Allocation:

Allocation shows the quantities of items that have been assigned a specific order but have not yet been sent from the stockroom to production. When a planned shop order and its accompanying picking order for a manufacturing item is released by the planner, MRP places the released order quantity (which may or may not be the same as the planned order quantity) in the completion time-bucket as a scheduled receipt. The required components are then shown as

i§allocatedi¨ in each component record. There is a time lag between order release and physical component disbursement. The physical disbursement of the components reduces both the on-hand and allocated inventories by the same amount. The components allocated to a released order are treated as unavailable and are deducted from the on-hand inventory to avoid distortion of inventory status.

Safety time:

Safety time is an element of time added to normal lead-time to protect against fluctuations in lead-time so that an order can be completed before its real need date. When the lead times are longer, the planned order releases are earlier, but the planned order receipts remain the same. Therefore, even if lead times are made longer to compensate for a supplier that tends to deliver materials late, orders will still be filled late, because although the orders are released earlier the due dates remain unchanged. Safety time changes not only order release dates but also due dates. If we use safety times instead of longer lead times, the MRP system will plan both planned order releases and planned order receipts for earlier dates.

Past Due:

As MRP updates itemsi¦ material requirement files, any remaining contents of buckets representing the period just passed are dropped into the past-due columns. These fields are indicators of poor performance. A positive value for gross requirement in the past-due column represents delinquent performance, i.e. customers originally scheduled to be delivered earlier than current date. It is a back order, and is considered urgent. A negative gross requirement in the past-due column represents excessive performance and has already been deducted from the on-hand quantity. Positive values for scheduled receipts in the past-due column indicate tardiness of the suppliers. In this case, records should be re-balanced and the inter-level equilibrium should be restored. Negative scheduled receipts in the past-due column represent excessive quantities received. Positive planned-order releases in the past-due column represent

urgent replenishment needs. Negative planned-order releases in the past-due column represent excessive quantities released. Negative values for gross requirements, scheduled receipts, and planned order releases in the past-due column can be ignored.

Projected on-hand:

For the first period, projected on-hand inventory (POH) equals on-hand inventory (OH) plus scheduled receipts (SR) in period 1 plus past-due scheduled receipts. If POH is a positive number, allocation and gross requirement (GR) should be subtracted as well. This is shown in Table 5.

POH(1) = OH + SR(1) + max{SR(past-due),0} iV allocation - GR(1), and

GR(1) = GR by POR of parent + Independent demand

+ max{GR(past-due),0}.

For the other periods, the projected on-hand in period t is

POH(t) = PAB(t-1) + SR(t) iV GR(t).

Projected available balance (PAB) will be defined later. Projected on-hand balance is used to determine whether there is a net requirement in a particular period. If the projected on-hand balance is less than the safety stock, the net requirement equals the difference between the two. As shown in Table 18, the net requirement NR(t) is

IF POH(t)>=SS THEN NR(t)=0 ELSE NR(t) = SS - POH(t).

Planned order receipt:

Planned order receipt is the quantity of materials expected to receive on a future date. It is the net requirement quantity adjusted by the lot-sizing rule. The planned order receipts differ from the scheduled receipts in that the former has not been released. In Table 5, the lot-sizing rule is the minimum order quantity LS, planned order receipts are

$$PORcpt(t) = \max\{NR(t), LS\}.$$

Planned order release:

Planned order releases are the planned order receipts after adjustment for lead-times. In Table 5, if LT is the lead-time,

$$POR(t) = PORcpt\ (t - LT).$$

Planned orders at one level are expanded into the gross requirements for components at the next level. When a planned order is released, the corresponding planned order receipt is changed into a scheduled receipt. Both planned orders and released orders are used in calculating the capacity requirements of work centers in each period in the planning horizon.

Projected available balance:

Projected available balance is a projection of future inventory balance. It is the projected on-hand balance plus the planned order receipt. In Table 5,

$$PAB(t) = POH(t) + PORcpt(t).$$

Nervousness in MRP:

Because of the level-by-level expansion and lot-sizing rule of the MRP procedure, minor changes in higher lever schedules cause significant changes in lower level schedules. For example, a minor change in MPS will cause significant timing or quantity changes for a material at level 5 or 6. If a system is constantly generating wildly different schedules, its credibility will suffer. The causes of MRP nervousness include changes in MPS, late supplier deliveries, poor material

quality, record errors, unplanned transactions, etciK Managerial approaches to reducing MRP nervousness include seeking better communication with customers, better relationships with suppliers, and a better data processing discipline. In MRP systems, pegging and firm planned orders are frequently used to reduce MRP nervousness.

Pegging:

The contents of gross requirements buckets represent the total requirements derived from an itemi¦s parents and from additional external sources of demand, and are summarized by period. The sources of gross requirements are obscure. Pegging is a procedure in the MRP system which saves information such as period, quantity, external orders and the identity of the parent from which a planned-order release is derived in a peg file. The pegged-requirements file permits the inventory planner to trace upwards, level by level, the product structure to determine which parents generate what portion of itemi¦s total gross requirements in any given period. A planner can use pegging to trace the demands to their ultimate sources, specific buckets for individual end items in the master production schedule. A where-used report lists all parents of a component item. A pegged requirements file, which may be thought of as a selective where-used file, lists only those parents that have planned orders in the planning horizon. A where-used report lists all parents of i§one uniti¨ of a component; a peg file lists the required quantities of the parents.

Firm planned order (FPO*) :*

An MRP program is executed periodically. In each execution, MRP reschedules the planned orders and causes nervousness. Firm planned orders suppress this nervousness by overriding the computer-driven changes. When a planned order is defined as a FPO, i.e., it is frozen in quantity and time, the computer is not allowed to change it automatically. This is the responsibility of the planner in charge of the item that is being planned. The FPO may result in a PAB less than the safety stock. By using pegging to determine which customer orders are

affected, planners can decide whether to expedite shop orders or purchase orders, or postpone customer orders. FPO can help planners working with MRP systems to respond to material and capacity problems by firming up selected planned orders. FPO should be used judiciously for a few specific planned orders only rather than for an itemi¦s entire planned-order release schedule.

If the planned order releases of X in period 1 and 3 are defined as firm planned orders, in the next run of MRP, they are either switched into scheduled receipts at the same timing and quantity, or kept in planned order releases without changes in timing and quantity. Firm planned orders are indicated with asterisks as shown in Table 6.

Table 6: Firm Planned Orders:

P_No. =X	Past	OH=	200	LT=	1	SS=	150	AL=	0	LS=	400	ST=	0
Periods	Due	1	2	3	4	5	6	7	8	9	10	11	12
Indep. D.		100	400	300	200	100	200	300	100	100	400	300	200
Gross R.	150	250	400	300	200	100	200	300	100	100	400	300	200
SR	100	400											
POH		450	50	150	-50	250	50	150	50	350	-50	50	250
PAB		450	450	150	350	250	450	150	450	350	350	450	250
Net R.		0	100	0	200	0	100	0	100	0	200	100	0
PO Rcpt.		0	400	0	400	0	400	0	400	0	400	400	0
POR	0	*400	*0	*400	*0	400	0	400	0	400	400	0	0

Suppose the planned order releases from period 1 to period 4 are defined as firm planned orders, that is, the planned order receipts from period 1 to period 5 are fixed, and the independent demands in period 5 and 6 are rescheduled to period 4. The new MRP report of X in the next run is shown in Table 7.

Table 7: New MRP Report with FPO

P_No. =X	Past	OH=	450	LT=	1	SS=	150	AL=	0	LS=	400	ST=	0
Periods	Due	2	3	4	5	6	7	8	9	10	11	12	13
Indep. D.		400	300	500	0	0	300	100	100	400	300	200	200
Gross R.		400	300	500	0	0	300	100	100	400	300	200	200
SR		400											
POH		450	150	-350	50	50	150	50	350	-50	50	250	250
PAB		450	150	50	50	450	150	450	350	350	450	250	250
Net R.		0	0	500	100	100	0	100	0	200	100	0	0
PO Rcpt.		0	0	400	0	400	0	400	0	400	400	0	0
POR		*0	*400	*0	400	0	400	0	400	400	0	0	0

The fluctuations of independent demands do not cause any change for the POR of product X and all the descending items. The projected available balances in period 4 and 5 are below the safety stock, which should be evaluated by the planner in order to determine whether further actions are necessary. If firm planned orders are not applied, the MRP report of X in the next run is as shown in Table 8.

Table 8: New MRP Report without FPO

P_No. =X	Past	OH=	450	LT=	1	SS=	150	AL=	0	LS=	400	ST=	0
Periods	Due	2	3	4	5	6	7	8	9	10	11	12	13
Indep. D.		400	300	500	0	0	300	100	100	400	300	200	200
Gross R.		400	300	500	0	0	300	100	100	400	300	200	200
SR		400											
POH		450	150	-350	150	150	-150	150	50	50	150	-50	150

PAB		450	150	150	150	150	250	150	450	450	150	350	150
Net R.		0	0	500	0	0	300	0	100	100	0	200	0
PO Rcpt.		0	0	500	0	0	400	0	400	400	0	400	0
POR		0	500	0	0	400	0	400	400	0	0	0	0

The quantity of original POR of X in period 3 is changed from 400 to 500, as well as the planned order releases in period 5, 6, 7, 8, and 10. These changes bring severe fluctuations in the descending items.

Comparison of POR, FPO, and SR:

Planned order releases, firm planned orders, and scheduled receipts are all material replenishment schedules. They differ in their flexibility. A scheduled receipt is a released order and difficult to change. A firm planned order has not been released, but can only be changed by the planners. A planned order release is automatically changed by the MRP system. Both POR and FPO are expanded to lower levels, but scheduled receipts are not expanded further. The computer reschedules the POR automatically but does not generate exception reports even if planned order releases are changed. In the case of firm planned orders, the projected available balances may be less than safety stock or even be a negative number, and the MRP system generates exception messages. The scheduled receipts are not changed, but if they become inadequate because of variation in gross requirements, the MRP system generates exception reports. For firm planned orders and scheduled receipts, the planners control the order release dates, due dates, and quantities. The start dates, need dates, and order quantities of the planned order releases are determined by the computer automatically. Table 9 summarizes the comparison of the planned orders, firm planned orders, and scheduled receipts.

Table 9: Comparison of POR, FPO, and SR:

Properties	POR	FPO	SR
Rescheduled automatically?	Y	N	N
Exploded to lower levels?	Y	Y	N
Exception messages generated?	N	Y	Y
User control of release/receipt dates and quantities?	N	Y	Y

Regeneration and Net Change:

There are two ways of using MRP systems: regeneration and net change. The differences between regeneration and net change are the data fed into the system, the retention of MRP results, and the frequency of execution.

The input data:

The input data for the regeneration MRP program includes the entire contents of the master production schedule file, bill of material file, on-hand and open order inventory status, and item master records of all MRP items. For net change MRP, only changes in the master production schedule, the bill of material, and the on-hand and open order inventory status are fed into the MRP system. For instance, customer order revisions, supplier delivery date changes, defects in on-hand inventory, and BOM changes caused by an engineering change or special customer needs are all input data for a net change MRP program.

The retention of MRP results:

A regeneration MRP program regenerates a completely a new MRP report at the end of each period. The previous MRP reports are not used by the system. The MRP generates reports according to the input data at run time. In contrast, a net change MRP system continually retains previous reports, and updates them with

the result of MRP when updated data is fed into the system. One drawback of the net change MRP is that, because prior results are retained in the system, errors are inherited by each subsequent run. When the number of errors is no longer tolerable, the regeneration MRP program is executed to eliminate the errors.

The frequency of execution:

The re-planning frequency of net change MRP is more frequent than that of regeneration MRP. Regeneration MRP is generally executed weekly while net change MRP is re-planned daily or real-time, when triggered by transactions. Because the calculation loading time is much shorter for net change MRP, its re-planning frequency can be higher. However, since only the change data is processed, net change MRP cannot purge the errors as regeneration MRP does.

Changes in Net Change MRP:

The changes considered by net change MRP include changes in gross requirements (including products, service parts, or dependent demand items), on-hand inventory, scheduled receipts, and BOM.

Changes in gross requirement:

As MPS is a rolling schedule, each new period rolls in when the first period in the previous MRP rolls out. A non-zero demand in the last period is always a change of gross requirement in MPS. When customer orders are changed or forecasts are revised, the gross requirements in MPS change. Because of the lot sizing rule, a gross requirement change in an MPS item does not always bring a change in its planned order release. If MPS changes, the gross requirements of the MPS itemsi¦ components also change. The componentsi¦ planned order releases may or may not change, depending on the results of lot-sizing rule. Changes in independent demand items such as service parts are processed in the same way. Since the MRP results prior to the changes remain the same, another MRP calculation is not required. In conclusion, the changes in gross requirements of

MPS, service parts, or dependent items are processed with the MRP logic, in the sequence of the low-level code, and from the period of the first change.

Changes in on-hand status and scheduled receipts:

Normal transactions of inventory status, such as the issuance of materials to feed a shop order, or the transformation of planned order releases into scheduled receipts, are not considered net changes. Abnormal changes such as adjustments for defects found in on-hand stock, a delay in delivery from suppliers, an unexpected change in the order quantities from suppliers, etc, are considered to be changes in net change MRP. If on-hand inventory status changes, the item and its descendants, whose gross requirements are affected, undergo processing for the whole planning horizon. If the scheduled receipts change, the item and its descendants, whose gross requirements are affected, are processed from the first SR change.

Changes of BOM:

If the BOM of an item is changed, the net change MRP processes that item and all of its descendants whose gross requirements are affected, for the whole planning horizon.

Net change MRP can either be executed in daily batch or whenever a change occurs. If executed in a daily batch, all the change data in a day must be collected before the execution of MRP. If a real time process is employed, then change triggers the MRP execution. The results of the net change MRP are used to update the previous MRP reports.

Comparison of Regeneration and Net Change:

The comparison of regeneration and net change MRP is listed as following:

Regeneration:

1. Time-triggered, periodically.
2. All MPS items are expanded.
3. Every active BOM is utilized.
4. Inventory and order status of every item is recomputed.

5. Low-frequency re-planning, weekly batch
6. Self-purges errors from file.
7. Data processing is relatively efficient.
8. Voluminous output is generated.

Net Change:

1. Transaction-triggered, continuously.
2. Changed MPS items are expanded.
3. Partial BOM is utilized.
4. Only inventory transaction related items are recomputed.
5. High-frequency re-planning, daily batch or on-line real time
6. Keeps MRP continually up-to-date.
6. Minimizes the requirements planning job after MPS revision.
7. Requires stricter disciplines.

The Activities generated by MRP:

The system categorizes MRP results according to the sources of the materials, including purchasing, subcontracting, manufacturing, and transferring.

Purchase requisition:

Purchase requisition is an authority given to the purchasing department to purchase specified materials in specified quantities within a specified time. (Apics, 1995) The requisition department specifies a date and the planned order releases, which are summarized in a purchase requisition suggestion report. The purchase requisitions in the past-due period are indicated as urgent. After reviewing the purchase requisition suggestion report, the users revise and confirm the purchase requisition data.

Purchase order:

Purchase requisitions become purchase orders after the purchasing department reviews and revises the quantities, due dates, and suppliers. The users use the purchase order suggestion report in order to determine which purchase orders to make. Prices and other terms of the default suppliers are retrieved from the supplier-price file in the database. If the users decide to change suppliers, they

must change the default suppliers in the supplier-price file first, and then go back to the purchase order suggestion. After reviewing the purchase order suggestion report, the users revise and confirm the purchase order data. The system then prints out the purchase orders or sends out the purchase orders through fax or email.

Subcontracting order:

A subcontracting order is an order for sending production work outside to a subcontractor. It is an authority to the subcontractors to produce specified parts in specified quantities within a specified period of time. It is similar to the purchasing procedure except that there is a material issue process. In a material issue process, the system generates a picking order for each subcontracting order with shortage messages for the different components.

Manufacturing order:

A manufacturing order, or shop order, is a document conveying authority to manufacture specified parts or products in specified quantities within a specified period of time (Apics, 1995). Manufacturing departments use the manufacturing suggestion reports to determine shop orders for the planned order releases. The manufacturing suggestion reports are sorted by the manufacturing departments and the plan dates. Material picking order information is generated as in subcontracting.

Transferring order:

A transfer order is a document conveying authority to transfer specified parts in specified quantities at a specified time from one segment of an organization to another segment within the same organization. The MRP system generates transfer-in suggestions for the departments who need the materials from other departments, and transfer-out suggestions for the departments who provide the materials for other departments.

Action report:

An action report is a rescheduling notice. Action messages include: canceling of an order, moving the due date of an order forwards or backwards, and increasing or decreasing the quantity of an order.

Exception report:

MRP systems generate exception reports containing the following information: shop calendar data not exists, part number not exists, without information for supplier or subcontractor, negative inventory, lack standard times for manufactured items, lack bills of material for manufactured or subcontracted items, exceed maximal order quantity, etc.

Recapitulation on MRP:

Every manufacturing company has inventory, even job shops that purchase material for each job. It's difficult to purchase just what is needed without any surplus material left over at the end of the job. Surplus material becomes inventory. It is now a common practice for customers to place blanket orders with small monthly releases. Most shops are forced to make longer runs (because small runs are not cost effective) and therefore hold finished goods inventory. It's difficult for any company to escape having an inventory.

Purchasing just what is needed for specific jobs can be inefficient; if you can combine commonly needed materials for several jobs into one order, you can get better prices. Any savings is pure profit. Many job shops purchase just for the job simply because they have no easy way of identifying common material requirements.

For make-to-stock companies that require on-hand inventory, many companies use a reorder level to trigger purchase orders. The reorder level is usually determined by average usage of the material, the lead-time it takes to get in,

and some safety stock to cover unusual usage. For example, take an item with an average usage of 100 per week and a lead time of four weeks. The reorder level might be set at 500, which covers four weeks usage and includes 100 extras as safety stock. Any combination of requirements causing inventory to dip below the reorder level triggers a purchase order or work order.

There are two major problems with this method. One is that it is only workable for a very short time horizon. Material requirements, though, usually have to be planned over many weeks or months. Current and long-term requirements can easily get commingled, resulting in more inventory than is needed.

The other problem is that in manufacturing the due dates not often get changed to reflect delays. Work orders get delayed all the time for a variety of reasons -- lack of a key component, machine breakdowns, late vendor deliveries, etc. If all the related due dates for materials and subassemblies are not moved out, everything looks like it's due now. Either too much inventory is brought in, or more typically, companies revert to ignoring due dates and go back to using shortage lists and expediting, the most costly and inefficient method by far.

An MRP system, which schedules and reschedules material requirements as new orders come in and existing orders get changed, is a clearly superior planning method for any type company, even job shops with very simple material requirements.

All that is needed to make an MRP program work are accurate bills of material and dedication to keeping dates accurate. If you object to maintaining accurate dates as too much works, you are just kidding yourself. The work required to maintain good dates involves far less time than the alternative – worthless dates and planning by shortages.

Chapter: 4 - MRP at BASF Bangladesh Limited:

4.1 MATERIALS REQUIREMENT PLANNING (MRP) AT BASF BANGLADESH LIMITED:

BASF Bangladesh Limited established a petite production plant to produce tailor made textile and leather auxiliaries named as OMP (own manufactured products) to feed local textile and leather industries in 1985.

To prepare a production plan and to schedule production BBL uses/ requires an approved sales forecasts (SF) from textile and leather department. Respective Assistant Managers of textile (marketing) and leather (marketing) under close supervision of their respective Managers prepare 3(three) months rolling SF for OMP sales considering the current market demand, past sales trend, future potentiality, seasonality and other environmental factors pertaining to demand both for Dhaka and Chittagong market segments.

There is a prescribed SF format having the following fields/parameters:

- Name of the products (arranged alphabetically);
- Stock in hand on the SF preparation date;
- Actual sales of the preceding 3(three) months;
- Year to date (YTD) sales data starting from January of the year under consideration;
- Sales budget for the current year;
- Previous year's sales data;

- Sales projection for the current month;
- Sales forecast for the coming 3(three) months;
- Estimate for additional 3(three) months;

Concerned Managers (Marketing) submit SF to their respective Marketing Directors for approval. Marketing Director approves the SF after fine tuning and necessary adjustment for last moment changes, if any.

Manager (Marketing-Textiles) and Manager (Marketing-Leathers) send approved SF to the Production Director copy to Manager (MM). Production Director calculates/prepares raw materials requirement budget in a prescribed form no. 06-03-Pur-F-02 in every month based on SF, plant capacity, specific product recipe and forward the same to Manager (MM) for the procurement of raw materials.

Manager (MM) prepares procurement plan/stock replenish plan considering present stock, stock in the pipeline, previous 3(three) months average consumption, average consumption of previous year, safety stock, lead-times, pack-size, FCL quantity, minimum order quantity, purchase discount, EOQ etc. Normal lead-time from European countries is 4-5 months whereas it is 2-3 months from other Far East countries. It is the company policy to keep 2 months inventory on hand to cover 1(one) month's sales equivalent quantity (ies) as safety and 1(one) month's sales equivalent quantity (ies) for running sales and 1(one) to 3(three) months equivalent quantity (ies) in the pipe line based on lead-times.

Respective Assistant Manager also prepares SF for ex-stock (merchandise) sales similar to OMP sales and forwards one requisition form duly filled in and signed for procurement of merchandise for ex-stock sales to Deputy

Manager (MM) duly approved by the respective Marketing Director. Deputy Manager (MM) analyses the requisition in depth, verify prices, pack size, products cosmos article number and modify quantity (ies) as well as delete product(s) if necessary after discussion with initiator of the merchandise requisition. Same policy as like as raw materials procurement is observed especially for safety stock, running stock, lead times, stock in pipeline etc.

Requirement & suggestions:

A system support with a LAN between Head Office and Factory for the smooth functioning of Materials management, Production planning and scheduling as well as Marketing.

Now BASF is going to implement SAP for the functioning of proper Coordination & controlling.

4.3: VENDORS SELECTION

- **Searching of source and Selection of Vendors:**

Upon request of production department or as and when required Manager (MM) sends a general query to all existing suppliers specifying the name of the product(s) required for, technical specification of the product(s), payment term, delivery time, country of origin, price of the product and any other information pertaining to the product(s) and also collects the same. If the product specification and other documentary evidence are found to be satisfactory, Manager (MM) or his Deputy collects offers and sample with certificate of analysis (CoA) where

possible, technical literature, material safety data sheet (MSDS) etc, from the vendors.

Manager (MM) prepares a comparative statement (CS) using quality of the product under review, price, lead-time, payment terms and existing performance, if any against each vendor. Quality is given highest priority/weight followed by price, lead-time and others. Assistant Manager (Purchase) takes necessary steps to clear the sample(s), and handover it (these) to the respective department (e.g. textile/leather/production). Manager (QC) or his deputy is responsible to verify quality of vendors products (Raw and ancillary), whereas, Manager (MM) or his deputy is responsible for verification of vendors capability in respect to supply right product on time. Manger (MM) searches for new vendors through different chambers, business forums or as per advise(s) from existing supplier(s)/vendor(s), if existing vendor(s) do not have the materials required. QC Department performs details study and conduct necessary laboratory tests and experiments in case of new vendors

Manufacturing facilities of local manufacturer(s) are audited, if required prior to select them as approved vendor(s) and manufacturing facilities of foreign vendor(s) is/are also audited before selecting them as vendor(s) where possible as per BBL's policy, but no such instances are available at the time of preparation of this report and analysis.

The vendor is then considered as "conditional vendor" and identified with a "*" (star) mark if the results of all assessments are found to be satisfactory. The conditional vendor is placed in approved list, if first lot of supply meets all the specified requirements.

- **Review the existing price and/or price Negotiation with existing and new vendor(s):**

Manager (MM) reviews the price periodically and verifies its competitiveness. He also negotiates the price, bargains and fixes the same down to market price, gains purchase discount for bulk order where possible.

- Responsibilities during Enhancement of price by vendor(s):

Manager (MM) checks the enhanced price received from existing supplier in terms of degree of enhancement, price of other suppliers where possible, world market trend, exchange rate fluctuation etc. The main purpose is to verify the price whether it reflects the conditions of a competitive market. He also negotiates the price with supplier as and when it is justified to fix a fair price.

- **Requirements and Suggestions:**

A system link between MM and Production Department would be very much helpful to save communication time and establish a better coordination which will in turn ensure efficient team-work with the philosophy of group dynamics.

- **ORDER PROCESSING (IMPORT):**

Manager (MM) is responsible for the procurement of raw materials and merchandise and others including capital machinery, laboratory equipment, packing materials in time in right quantity with a reasonably

minimum costs. He starts order processing immediately after completion of procurement forecast/plan and selection of vendor(s).

- **Raising Purchase Order:**

Manager (MM) prepares and issues Purchase Order (PO) in a prescribed form called indent for procurement through import. Manager (Logistics) prepares indent based on request/advise from the respective marketing colleagues and forward it to the customer or respective marketing colleagues for onward forwarding to the customer. However, indent that is prepared by MM differs in its serial number and the name of the buyer. A purchase order does have the following fields:

- Unique sequential number and date;
- Brief specification of materials;
- H.S. Code (ITC code number);
- Name and address of the supplier
- Quantity/Pack size;
- Unit price of items and value
- Payment terms;
- Signature of the authorized person;
- Special terms and conditions, if any e.g. country of origin, port of shipment, mode of transport, special packing instruction, shipping marks etc.

Indent is used as an alternative to proforma invoice/purchase contract with details terms and conditions in the overleaf.

Currently, indent is being prepared using in house software called indent-monitoring system. MM department collects 7-digit number at the beginning of each year from BASF AG (upper and lower limit inclusive) and loads it before hand into the system. One number is allocated/used for one product. Date of indent and its lower limit is automatically generated from the system whereas upper limit is manually entered to the required level based on number of products to be incorporated in a single indent. Name of the respective buyer/customer with detailed address is selected from a linked buyer/customer lists as well as name and address of the vendor/supplier from the linked suppliers/vendors list. Incoterm, Currency code and Technical/Commercial specifications of products are entered manually in accordance with import policy of the government. A detailed product lists are readily available in the system created with 9(nine) digits product number collected from BASF AG. Name of the product can readily be retrieved entering product number or searching with product name. The indent monitoring systems has the flexibility to insert, edit or delete product name, buyers' name, seller/suppliers' name as and when required. Quantity and price are then entered manually. The value is calculated and appeared automatically against each and every product (right side) since pre-defined formula is incorporated (quantity x price). Marking and special instructions are required to enter manually alongwith port of shipment, packing requirement, country of origin etc. It has also the facility to incorporate name of the issuer in abbreviated form (for an example AHB stands for Abdul Hakim Bhuiyan). Total quantity and value are also calculated and appeared automatically. Indent Monitoring System has the printing option in a pre-printed and pre-designed continuous sheet of papers.

- **Approval of P.O.:**

  Indent/Purchase Order is issued/approved by/through putting signatures of any two persons not below than a manager as indentor in the designated box at the bottom of the indent form and two signature are also required as buyer.

- **LC Processing:**

  Bangladesh Bank being a Central Bank of Bangladesh has administrative/controlling power on all commercial banks/financial institutions and to play with foreign exchange. To gain control over foreign exchange transactions LC plays a vital role, facilitates national and international trade, and makes a bridge between seller and buyer. To establish an LC BBL requires the following documents/papers duly filled in and signed by 2(two) authorized signatories as per company's policy:

  - LC application form (provided by LC opening bank)
  - IMP form (provided by LC opening bank as prescribed by central bank)
  - LCA form (provided by LC opening bank as prescribed by central bank)
  - IOF (jointly designed by PSI company, NBR, LC opening bank, Chamber of Commerce and/or Industry with a view to have necessary information required for completing PSI).

- **LC application form:**

It contains different fields and these fields are filled in either by writing/typing or tick (√) mark by the applicant/buyer such as the Type of LC (irrevocable/revocable/transferable), Name and address of the applicant/buyer, Name and address of the beneficiary/seller/exporter, payment term (sight/deferred), Port of shipment and delivery, Mode of transport (Sea/Air/Road), Inco-terms (Ex-works, FOB, CFR etc), Documents required (invoice, packing list, certificate of origin, BL/AWB/TR) in number of original copies, Goods description(s), Value, H.S. Code(s), Application date, Latest date of shipment, Negotiation period (15/21 days), Payment instructions, Special terms and conditions such as submission of documents etc, Special marking Directives for the communication of shipping/original documents etc.

Application form with judicial stamp of BDT 150.00 requires signature of the applicant with official stamp, if applicable at the bottom of this form.

- **LCA (Letter of Credit Authorization) form:**

LCA form is a substitute of previously used import license prescribed by the Central Bank. This form has been designed purposefully with 5(five) folds for the following purposes:

- Original for Exchange Control Purpose
- Duplicate for Customs Purpose
- Triplicate and Quadruplicate for the licensing authority (The Chief Controller of Exports and imports, in short, CCI&E).

- Quintuplicate for Bangladesh Bank registration purpose.

The main information those are essentially filled in (typed/handwritten) among others in LCA form are:

- Name and address of the importer
- IRC (Import Registration Certificate) number of the importer with its validity.
- Total credit amount both in local/foreign currency (in figure and words)
- Source of finance (Cash/Barter/Loan/Credit/Other)
- Annual import entitlement of the importer
- List of items with short description and ITC/BCT number (H.S. Code number)

LCA form requires signature of the applicant (must be the bank authorized signatory) at the time of application and counter sign of LC opening bank later and LC opening bank releases the duplicate copy of LCA form for customs purpose to the importer at the time of documents retirement or on any date after LC date.

There are two types of LCA form, one is designated for commercial import (ex-stock) and another is for industrial import (raw materials). LC with LCA for commercial import must be at sight basis, whereas, LCA for industrial import purpose may be at sight or deferred as importer thinks appropriate with bankers consent.

- **IMP Form:**

It is a form prescribed by Bangladesh Bank with 4(four) folds designated for:

- Original for Bangladesh Bank;
- Duplicate for Authorized Dealers (LC opening bank) for processing of exchange control copy of Bill of Entry;
- Triplicate for authorized dealers record; and
- Quadruplicate for onward submission to central bank in if original documents are not retired by applicant/importer.

IMP form contains a number of fields and these fields are required to be filled in using following information:

- Amount of foreign currency in figures and in words (CFR or FOB);
- Name of the beneficiary (exporter/supplier) with address;
- LCA form number and date;
- Commercial description of goods;
- H.S. Code no/ITC no.;
- Quantity of goods (e.g. KG/MT/LTR/PCS/FT/MTR);
- Country of origin (may differ with country of beneficiary);
- Port of shipment (may differ with country of beneficiary);
- Mode of transport (by Sea/Air/Road);
- Port of discharge/delivery (Any port in Bangladesh e.g. Chittagong, Dhaka, Benapole or any others);
- Indenter's name and address;
- Indenter's Registration Certificate (IRC) number and date with CCI&E and Bangladesh Bank; and
- Full name and address of importer/applicant.

LC application accompanies this form duly signed and stamped.

- **Purchase of Insurance Certificate:**

Purchase of Insurance Certificate prior to establish/open LC is a must in case of import under Ex-works/CFR terms as per government regulation. No import is allowed under CIF basis in Bangladesh. Only local Insurance Companies are allowed to issue Insurance Certificate or Air/Marine Cover Note (MCN) in favour of applicant/bank. BBL has a business relationship with 5(five) Insurance companies and these are:

i. Green Delta Insurance Company Limited;
ii. Federal Insurance Company Limited;
iii. United Insurance Company Limited;
iv. Prime Insurance Company Limited; and
v. Express Insurance Company Limited.

Insurance policy or MCN must contain the following information:

- Insurance interest i.e. Product description;
- Port of loading/discharge;
- Coverage (ICC 'A'/'B'/'C' TP, ND, SRCC, WAR etc);
- Mode of transport (Air/Sea/Road); and
- Insurance premium (110% of CFR) value and the rate vary with the extend of cover and the packing specification e.g. drum/bag/carton/pallet etc.

- **IOF:**

Pre-shipment inspection is a mandatory as per government regulations for all sort of import in Bangladesh since 15th February 2000 except a few. The whole world is divided into 3(three) blocks named "A", "B" and "C" by the government for PSI purpose. One Inspection company is nominated/selected by National Board of Revenue (NBR) of Bangladesh Government for each block. Intertek Testing Services is responsible for Block-A and Bureau Veritas is responsible for Block-B as well as Inspectorate Griffith is responsible for Block-C.

The main responsibilities of a PSI company include:

- Verification of the genuineness of importer based on TIN (Tax Identification Number) and VAT (Value Added Tax) registration number as well as Letter of Credit

- Issue Inspection Reference number (BDH/ID/RFI) against LC (if they found the information/papers are in order) which is being used as contact reference by the parties involved (Importer, Exporter & PSI Company) at the time of communication amongst/between them and simultaneously communicate the reference number with importer and their overseas office in the country of shipment.

- Conduct PSI at exporters premises at a date/time convenient to exporter and them.

- Issue CRF (Clean Report of Finding) on the quality, quantity, H.S. Code classification, value, packing etc.

For the smooth functioning of this PSI an IOF (Inspection Order Form) is provided with LC application duly signed by bank authorize person with stamp of the applicant. IOF contains the following information:

- Name of the PSI company
- Zone (Block)
- Names, addresses, name of the contact persons with phone/fax numbers and e-mail addresses of the importer, exporter and LC opening bank.
- Country of origin, country of supply, port of loading & port of discharge.

Manager (MM) prepares IOF manually since he doesn't get any system support at present.

- **Opening of L/C through EBSW (Electronic Banking):**

BBL has been using an electronic banking for which an Electronic Banking Software Window (EBSW) is installed/provided by Standard Chartered Bank, Dhaka through which following activities are done sitting inside the office:

- Processing L/C application with printing option
- Modification of L/C as and when needed prior to approval/release to Standard Chartered Bank through Internet with printing option.

Processing of L/C amendment application with printing option.

EBSW has several fields namely parties, dates, amounts, goods description, conditions through which all information required for the opening of L/C are entered. A list of suppliers details (name and address), name of their banks, applicants details (name and address), account number etc., are readily retrievable with a click. A file can be tem plated and retrieved as and when required with fixed data. Only a very few variable data are needed to complete a second task such as currency, amount, latest date of shipment and L/C validity/expiry, negotiation period, reference numbers etc. After completion of L/C application two authorized persons authorize the transaction using a very confidential password as an alternative to manual signature which ensures appropriate security to bank and applicant as well as help to protect from misuse. Since opening of L/C requires mandatory pre-printed LCA form, IMP form, IOF, MCN hence these are manually typed and send in the following day using PSB. PSB is a courier service between BBL and the bank provided by SCB in exchange of a monthly fixed charge.

After having approval from the bank-authorized person(s) of BBL, Manger (MM) or his deputy releases the transaction via internet (e-mail). SCB downloads later and establish L/C based on the information provided by BBL in the same day or in the following working day. A copy of L/C is faxed to BBL by SCB followed by applicant's copy through PSB.

BBL uses PSB for other purposes like sending/receiving of routine communication from/to BBL.

- **Cash Management through EBSW:**

EBSW do have the facilities related with cash management through a module with the following facilities/features:

- Processing of intrabank fund transfer from one account to other
- Processing of bank draft/pay order issuance application from any branch of SCB, modification/amendment of application if needed prior to approval of management and release with printing option
- Similar to opening of L/C, Cash Management is also practices by BBL.

- **E-mail services to SCB:**

EBSW has an option to send instruction/request/message pertaining to banking through e-mail. But BBL is not using this e-mail rather they send instruction/request/message as an when required through PSB (hard copy) or by fax followed by original (faxed copy) through PSB.

- **Account related services:**

Statement of bank accounts can be downloaded through EBSW. Normally all transactions are updated/loaded once in a day at the end of the working hours by the bank. Thus, it shows statement of all transactions debit and credit with balance of the previous day with a printing option. Very recently, BBL has received a proposal to install software called cheque-writer through which a pre-printed cheque sheet can be

written/printed with a facility to keep the brief history in the system. It has also an option to generate different customized reports such as number and amount of cheque(s) issued during a certain time period, number and amount cheque(s) issued to a beneficiary within a specific time frame, number of cheque(s) issued during a time frame equal, less or over a certain amount etc.

- **Placing of Order:**

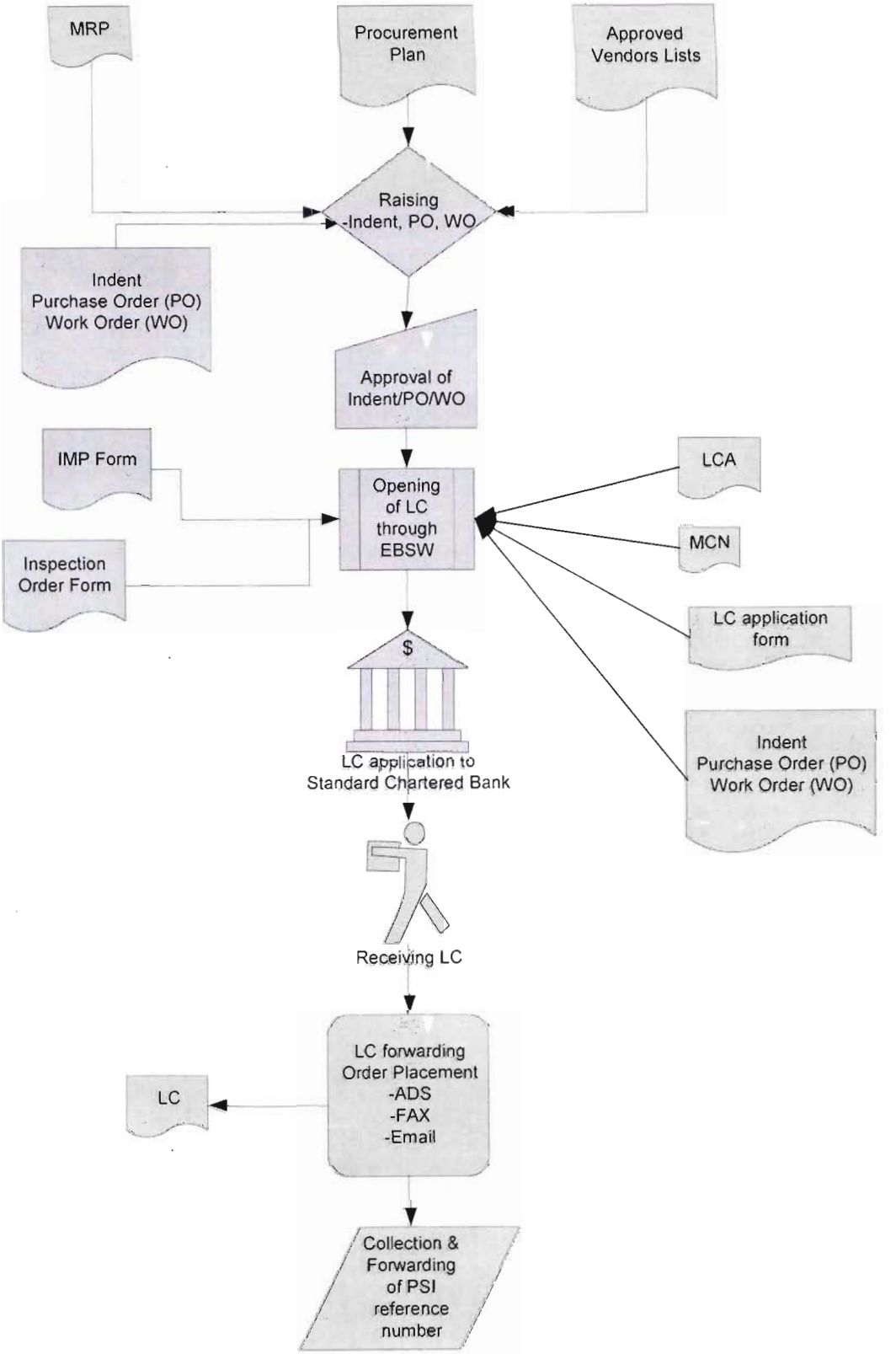
Manager (MM) places order on or before/after establishment of LC or along with LC. BBL places order in the form of Order Sheet by e-mail or fax to BSEA, ADS by e-mail to BASF AG and indent copy by fax to other suppliers. However, copy of LC is sent by fax to all suppliers. Off-course, copy of LC is checked prior to fax whether it's established in accordance with application as desired. Amendment request is sent verbally over phone to bank if it is not established correctly by bank. An amendment request is also sent/released if anything omitted wrongly at the time of LC application and/or for a change required and mutually agreed upon (buyer and seller).

- **Collection and communication of PSI reference number:**

LC opening bank forwards IOF alongwith indent, LC and MCN copies to PSI Company. PSI Company receives MCN, TIN and IOF from the LC opening bank for the verification of genuineness/authenticity of importers. LC contains VAT registration number and Tax Identification number (TIN). PSI Company verifies genuineness of the importer through VAT registration number and TIN as well as LC with LC opening bank. If PSI Company found all information in order then issues PSI reference number

which is being used as reference number by importer, exporter and PSI Company for PSI purpose followed by issuance of CRF (Clean Report of Findings) and certify original invoice and original packing list with CRF number and issue date. BBL collects PSI reference number (BDH/ID/RFI) from local office of PSI Company and sends it to the supplier. Normally it takes 2-4 days.

4.7 Flow Chart



- **Requirement & Suggestions:**

- Link PO (indent) for data sharing amongst/with Order Sheet, EBSW (if possible), Cash management, Accounts, Preparation of IOF, LC application, IMP form, LCA form which will intern make the life of Material Manager easy, produce better control, increase efficiency.

Chapter:5- Findings, Observations& Conclusion:

5.1 : Problems Identified in MRP at BASF Bangladesh Limited:

BASF Bangladesh is well established Company with its skilled employees. In every department of the company, high degrees of skilled professionals are Conducting its operation. That's why there is not any major problem concerning Material Requirement Planning.

- But in Material Management department it has seen and also come out from my studies that there is a lack of coordination with finance& other departments.
- BASF is now using SAP Software and they are not so competent to solve every problem concerning the company's day-by-day operation.
- In case of Merchandise product there is not any defined budget and hence a problem is existing there to make sound inventory.

Recommendation:

- Proper training on 'SAP" will enable the BASF professionals to solve the day-by-day problem more quickly.
- Proper coordination should be maintained with Finance department, marketing department, Production Department.

Conclusion:

Inventory Management system is very important for any Manufacturing Company like BASF

the reasons that has already mentioned.

Although BASF is facing some problem but due to use of highly technical computer program with their skilled professionals the overall position of the Company is satisfactory.

To complete my internship program, I have gathered vast knowledge on this topic and also on different part of business. I wish BASF with a grand success

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