

MANA ARMS MAGAZINE

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.....Empowering Minds

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FACULTY ARTICLE

In thermal power plants, boilers are critical for converting water into steam, which then drives turbines to generate electricity. They achieve this by utilizing heat energy from burning fossil fuels like coal, oil, or gas. The high-pressure steam produced by the boiler is then channeled to the turbines to generate mechanical energy, which is eventually converted into electricity by a generator.

Key aspects of boilers in thermal power plants:

Function:

The primary function of a boiler is to transform water into high-pressure steam using heat generated from fuel combustion.

Fuel Sources:

Boilers can utilize various fuels, including coal, oil, and natural gas.

Steam Generation:

The generated steam is then used to power turbines, which are connected to generators to produce electricity.

Efficiency:

The design of a boiler significantly impacts its efficiency and the overall power plant's effectiveness.

Types:

Boilers can be categorized based on their structure and function, including fire tube and water tube boilers.

Maintenance:

Regular maintenance and proper operation are crucial for ensuring the boiler's efficiency and longevity.

Types of boiler

1. Based on Tube Content

- Fire Tube
- Water Tube

2. Base on Operating Pressure

- Ultra-supercritical boiler: Pressure $\geq 27.0\text{MPa}$ or rated outlet temperature $\geq 590\text{ }^{\circ}\text{C}$ boiler
- Supercritical boiler: $22.1\text{MPa} \leq \text{Pressure} \leq 27.0\text{MPa}$
- Subcritical boiler: $16.7\text{MPa} \leq \text{Pressure} \leq 22.1\text{MPa}$
- Ultra-high pressure boiler: $13.7\text{MPa} \leq \text{Pressure} \leq 16.7\text{MPa}$
- High pressure boiler: $9.8\text{MPa} \leq \text{Pressure} \leq 13.7\text{MPa}$
- Sub-high pressure boiler: $5.4\text{MPa} \leq \text{Pressure} \leq 9.8\text{MPa}$
- Medium pressure boiler: $3.8\text{MPa} \leq \text{Pressure} \leq 5.4\text{MPa}$

3. Base on Fuel Used

- Solid Fuel Fired
- Stoker Fired Boilers
- Pulverized Fuel Boilers
- Fluidized Bed Combustion (FBC) Boilers
- Oil Fired
- Gas Fired Boilers

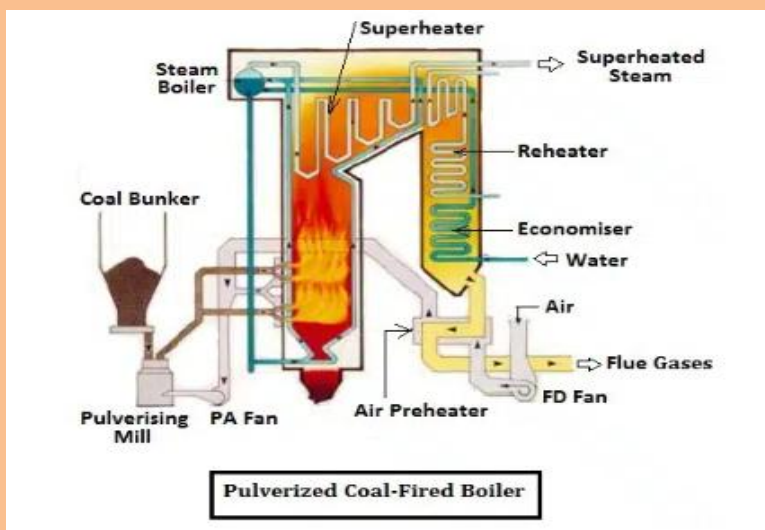
4. Based on Draught System

- Natural Draught
- Mechanical Draught
- Forced Draught System
- Induced Draught System
- Balanced Draught System

There are two types of boilers are used in sub critical, super critical and ultra-super critical coal fired thermal power plant:

- Pulverized coal-fired Boiler
- Fluidized Bed combustion (FBC) boiler
- Note: Both types of boiler are water tube boiler.

Pulverized coal-fired Boiler or Pulverized fuel Boiler



A pulverized coal-fired boiler is an industrial boiler that generates thermal energy by burning pulverized coal.

Steam boiler working:

In pulverized coal fired boiler, The coal is pulverized to a fine powder, so that less than 2 % is +300 micro meter and 70 – 75 % is below 75 microns. The pulverized coal is blown with part of the combustion air into boiler plant through a series of burner nozzles. Combustion takes place at temperature from 1300 – 1700 °C, depending largely on coal grade.

The flue gas formed in the furnace passes over the superheater, economizer, air-preheater, ESP and finally is evacuated by the induced draft fan into the chimney.

The ash from the combustion chamber, which falls down is collected in the bottom ash hoppers. The ash which is fine & flies with the flue gas is separated by ESP and collected in ESP hoppers.

The Feed water enters the boiler through the economizer tubes provided in the path of the flue gas. The feed water is heated in the economizer and then enters the boiler drum situated outside the furnace at the top of the Boiler.

The water is circulated in the tubes and converted into steam by gaining heat inside the furnace. The dry and saturated steam from the boiler drum then passes through the superheater section and finally available at the boiler outlet header.

Advantage of Pulverized Coal-Fired Boiler:

1. Ability to burn all ranks of coal.
2. It permits combination firing (i.e. can use coal, oil and gas in same burner)

Disadvantage of Pulverized Coal-Fired Boiler

1. High power demand for pulverizing.
2. Require more maintenance.
3. Fly ash erosion
4. Pollution complicate unit operation

ALUMNI ARTICLE



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19MQ5A0323

MERCEDES-BENZ GROUP

Mercedes-Benz Group AG (formerly Daimler-Benz, DaimlerChrysler, and Daimler) is a German multinational automotive company headquartered in Stuttgart, Baden-Württemberg, Germany. It is one of the world's leading car manufacturers. Daimler-Benz was formed with the merger of Benz & Cie., the world's oldest car company, and Daimler MotorenGesellschaft in 1926.



The company was renamed DaimlerChrysler upon the acquisition of the American automobile manufacturer, Chrysler Corporation in 1998, it was renamed to Daimler upon the divestment of Chrysler in 2007. In 2021, Daimler was the second-largest German automaker and the sixth-largest worldwide by production.

In February 2022, Daimler was renamed Mercedes-Benz Group as part of a transaction that spun-off its commercial vehicle segment as an independent company, Daimler Truck. The Mercedes-Benz Group's marques are Mercedes-Benz for cars and vans (including Mercedes AMG and Mercedes-Maybach).

It has shares in other vehicle manufacturers such as Daimler Truck, BAIC Motor and Aston Martin. Since 2019, Smart left Daimler AG and became a 50/50 joint venture with Geely. By unit sales, the Mercedes-Benz Group is the tenth-largest car manufacturer in the world; shipping two million passenger vehicles in 2021 and by revenue the seventh-largest car manufacturer worldwide in 2023.

Also in 2023, the company was ranked 42nd in the Forbes Global 2000. The group provides financial services through its Mercedes-Benz Mobility arm. The company is a component of the Euro Stoxx 50 stock market index. The central company headquarters, the Mercedes-Benz offices, a car assembly plant, the Mercedes-Benz Museum and the Mercedes-Benz Arena are situated in the Mercedes-Benz complex in Stuttgart.

The Mercedes-Benz Group origin is in an Agreement of Mutual Interest signed on 1 May 1924 between Benz & Cie. (founded in 1883 by Carl Benz) and Daimler Motoren Gesellschaft (founded in 1890 by Gottlieb Daimler and Wilhelm Maybach).

Both companies continued to manufacture their separate automobile and internal combustion engine marques until 28 June 1926, when Benz & Cie. and Daimler Motoren-Gesellschaft formally merged – becoming Daimler-Benz AG (Aktiengesellschaft) – and agreed that thereafter, all of the factories would use the brand name of "Mercedes-Benz" on their automobiles. The inclusion of the name Mercedes in the new brand name honored the most important model series of DMG automobiles, the Mercedes series, which were designed and built by Wilhelm Maybach. They derived their name from a 1900 engine named after the daughter of Emil Jellinek. Jellinek became one of DMG's directors in 1900, ordered a small number of motor racing cars built to his specifications by Maybach, stipulated that the engine must be named Daimler-Mercedes, and made the new automobile famous through motorsports. That race car later became known as the Mercedes 35 hp.

The first of the series of production models bearing the name Mercedes had been produced by DMG in 1902. Jellinek left the DMG board of directors in 1909. The name of Daimler as a marque of automobiles had been given by Gottlieb Daimler for use by other companies. It is or was used principally by Daimler Motor Company and Austro-Daimler later Steyr-Daimler-Puch but also, very briefly by Daimler Manufacturing Company and Panhardaimler, and others. The new company, DaimlerBenz, did not obtain consent to include Daimler in its brand name and used the name Mercedes to represent the Daimler-Motoren-Gesellschaft interest. Karl Benz remained as a member of the board of directors of Daimler-Benz AG until his death in 1929.

Although Daimler-Benz is best known for its Mercedes-Benz automobile brand, during World War II, it also created a notable series of engines for German aircraft, tanks, and submarines. Its cars became the first choice of many Nazi, Fascist Italian, and Japanese officials including Hermann Göring, Adolf Hitler, Benito Mussolini and Hirohito, who most notably used the Mercedes-Benz 770 luxury car. Daimler also produced parts for German arms, most notably barrels for Mauser Kar98k rifles. During World War II, Daimler-Benz

had over 60,000 concentration camp prisoners and other forced laborers to build machinery. After the war, Daimler admitted to its links and coordination with the Nazi government.

2007–2022: Daimler AG



In May 2010, the Shenzhen BYD Daimler New Technology Co., Ltd., trading as "Denza" was established between BYD and Daimler to produce luxury electric vehicles. In November 2014, Daimler announced it would acquire 25 percent of Italian motorcycle producer MV Agusta for an undisclosed fee. MV Holding acquired the 25 percent of MV Agusta back from Daimler in December 2017.

On 3 August 2015, Nokia announced that it had reached a deal to sell its Here digital maps division to a consortium of three German automakers—BMW, Daimler AG, and Volkswagen Group, for €2.8 billion. This was seen as an indication that the automakers were interested in automated cars. In 2017, Daimler announced a series of acquisitions and partnerships with car startups focused on car sharing, in a move towards what it sees as the next generation of car ownership and usage.

Part of its corporate strategy is to "transition from being an automobile manufacturer to a mobility services provider". In April 2017 it announced a partnership with Via, a New York-based ride-sharing app, to launch a new ride-sharing service across Europe. In September, it was announced that Daimler had led a fundraising round for car-sharing start up Turo, which is a platform that lets owners rent their vehicles out to other users. It also acquired Fliinc, a German startup that has built an app for peer-to-peer-style carpooling, has invested in Storedot, Careem, Blacklane, and FlixBus. It has also acquired car2go and mytaxi (now Free Now). Li Shufu of Chinese automobile manufacturer Geely took a 9.69% stake in the company, through Tenacious Prospect Investment Limited, in February 2018, making it the company's largest single shareholder.

Geely is already known from its ownership of Volvo Car Corporation. In September 2018, Daimler invested \$155 million in US-based electric bus and its battery management technology manufacturer Proterra. In July 2019, BAIC Group purchased a 5% stake in Daimler, which is a reciprocal shareholder in BAIC's Hong Kong listed subsidiary. In

September 2019, Daimler announced that it would be "stopping its internal combustion engine development initiatives as part of its efforts to embrace electric vehicles."

In February 2020, Daimler partnered with Twelve to create the world's first C-pillar made with polycarbonate from CO₂ electrolysis in an effort towards a fully carbon neutral fleet. In September 2020, the company was fined 875 million dollars by the United States for having violated the Clean Air Act. It agreed to pay \$1.5 billion to settle all related court actions. In February 2021, Daimler said it planned to rename itself adopting the name of its flagship marque, Mercedes-Benz, and spun off its heavy commercial vehicles unit, Daimler Truck, into a separate listed company.

Daimler Truck is listed on the Frankfurt Stock Exchange and its first trading day was on 10 December 2021. In the 2021 review of WIPO's annual World Intellectual Property Indicators Daimler ranked 8th in the world, with 65 of its designs in industrial design registrations being published under the Hague System during 2020. This position is up on its previous 10th-place ranking in 2019.

Formula One

On 16 November 2009, Daimler and Aabar Investments purchased a 75.1% stake in Brawn GP (Daimler holding 45.1%). The company was rebranded as Mercedes GP with its base in Brackley, UK and Ross Brawn remaining team principal.

The Brawn purchase led to Daimler selling back its stake in McLaren in stages, completed in 2011. [99] Mercedes continued to provide sponsorship and engines to McLaren until 2014. Prior to the 2011 season, Daimler and Aabar Investments purchased the remaining 24.9% stake owned by the team management in February 2011.

In November 2012, Aabar Investments sold its remaining shares, leaving the team (rebranded as Mercedes AMG Petronas F1 Team) wholly Daimler-owned. Daimler also owns Mercedes AMG High Performance Powertrains which, as of 2024, supplied engines to Aston Martin, Williams, and McLaren, in addition to Mercedes AMG Petronas.

STUDENT ARTICLE



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22MQ5A0301

FOOD AND BEVERAGE SERVICES

Introduction

The Provision of food & beverage away from home forms a substantial part of the activities of the hotel and catering industry. People need accommodation with food and beverages if they are away for more than a day and only food & beverage if they are away for a short duration.

Food & beverage service has developed into a huge industry. The number and type of eating out establishments has increased tremendously as suppliers constantly try to satisfy the changing demands and tastes of the market. In this first unit we are going to learn about the introduction of food and beverage industry.

Objectives

After studying this unit, the student must know.

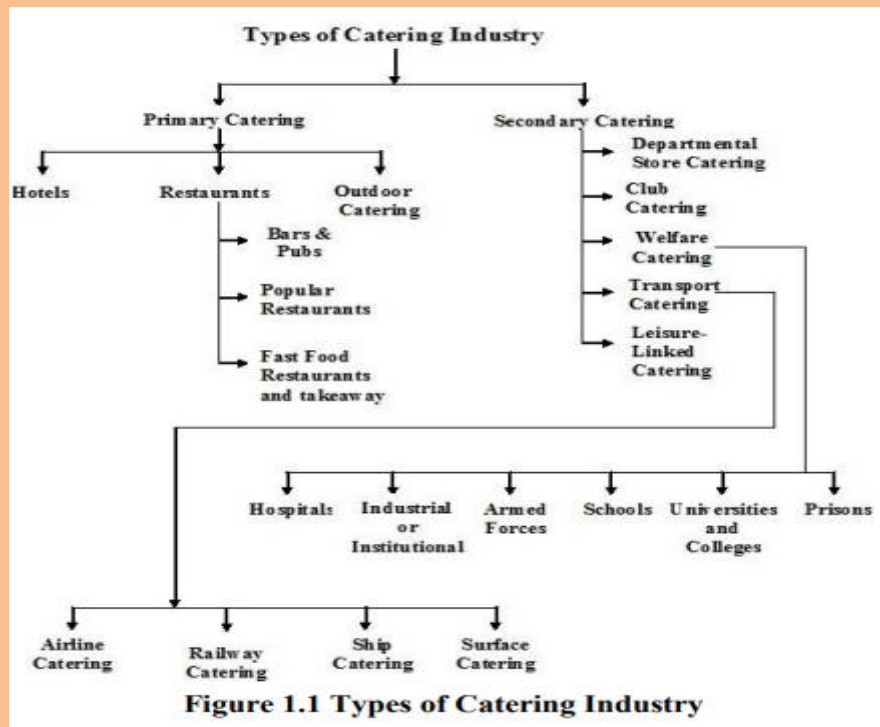
- Origin and growth of F& B Service
- Classification of Catering Establishment
- F&B Service Outlets and their layout
- Hierarchy of F&B Service Department and Modern Staffing
- Duties and Responsibilities of various employees in F&B Service
- Personal Hygiene
- Uniform and Grooming
- Coordination of F&B service with other department

Classification of Catering Establishments

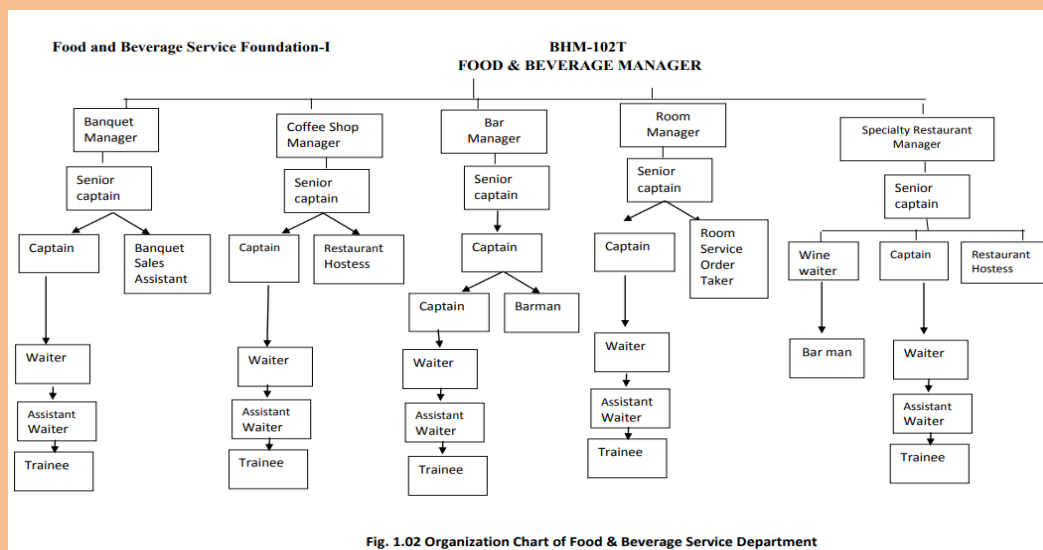
Catering is the provision of food, supplies and services for specific functions on particular dates and at given locations. An organization that provides food and beverage is called a catering establishment. The catering industry encompasses those places, institutions and companies that provide meals eaten away from home. From a wayside tea stall to an exclusive fine dining restaurant of a deluxe hotel and from mid-day meal service for a school children to meals for industrial workers, all come under the fold of Catering Industry. Catering management may be defined as the task of planning, organizing, controlling and executing.

Each an activity influences the preparation and delivery of food, beverage and related services at a competitive, yet profitable price. These activities work together to meet and exceed the customer's perception of value for his money. Catering in India has developed as a distinct segment of the food Service Sector spanning a broad spectrum of Commercial operations Providing a variety of Catering Services. These Service include three primary types:- banquet hall, off premises and mobile unit. Banquet hall catering, termed function catering, comprises independent units and those attached to hotels, convention or conference centers and restaurants. This type of catering can provide Several million rupees in revenue for a medium -size or large hotel. Generally, every major hotel and convention Center has banquet hall space.

Off-premise catering involves the taking of all food, supplies and services to a location designated by client. Off- premise events vary from the simple picnic in the park for fifty to the formal dinner for eight in the home, to the corporate entertainment for 10,000. Special event catering is a type of off-premise catering which requires a particularly high level of planning and co-ordination due to the high volume. Mobile unit catering utilizes specially designed trucks for provision of service to work sites. The units are equipped to serve fast food items & snacks. Catering differs from other segments of the food services sector by virtue of the diverse roles often assumed by the caterer. Clients often expect the caterer to provide more than the food and service. Partial lists of additional supplies and services which may be requested include entertainment, equipment, transportation of guests and parking at site. The modern status of the catering industry is a direct reflection of man's development.



Science and technology, exploration and travel, social and economical developments have all influenced this vibrant industry. There are many types of F&B operations. They may vary in size, style, location, and the market they are catering to. From a wayside tea stall to an exclusive fine dining restaurant of a deluxe hotel, and from mid-day meal services for school children to meals for industrial workers, all come under the fold of the F&B sector. It is necessary to classify all the F&B sectors for a better understanding of their operations. The responsibilities of catering industry include an awareness of the customers, their requirement of food, and the methods employed to meet these requirements. There are a number of ways of classifying food and beverage operations in today's catering field. There are Primary catering establishments and secondary catering establishments.



Hierarchy of F&B Service Department

The department can achieve its predetermined objectives efficiently if every employee knows the part he is to play in the team operation and how his/her role relates to the others and contributes to attaining the overall objectives. Every employee is given his/her duties and responsibilities in the hierarchy of reporting.

This is done in organizing, which is one of the managerial functions. Organizing is the process of:

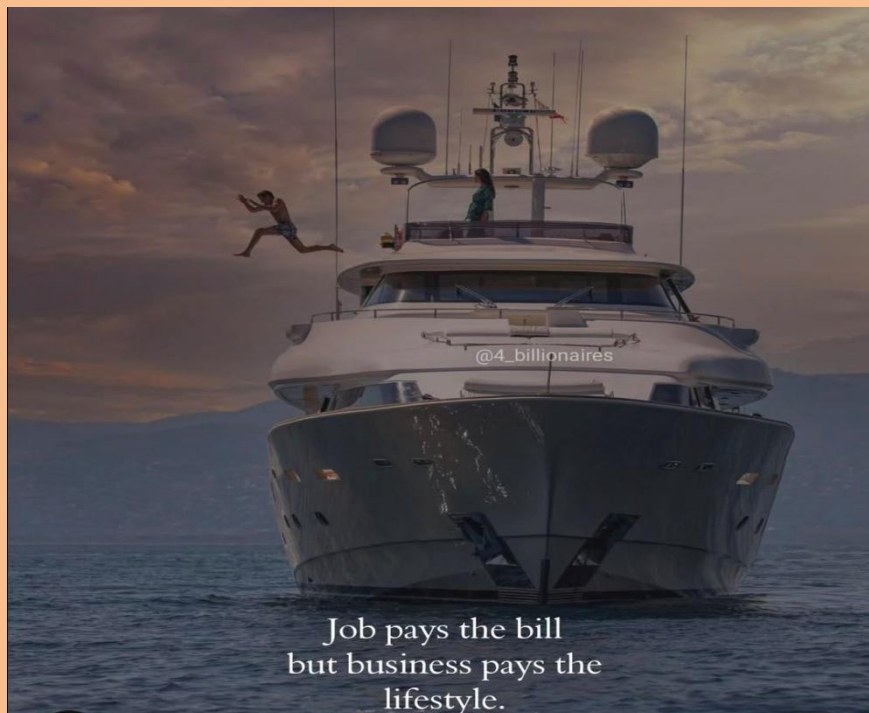
1. Identifying and classifying the activities to be performed
 2. Grouping of activities necessary to attain the objectives
 3. Assigning of each grouping to a manager with authority necessary to supervise it (delegation)
 4. Providing for coordination horizontally and vertically in the organization
- It may be summarized as 'organization is the process of identifying and grouping the work to be performed, defining and delegating responsibility and authority, and establishing relationships for the purpose of enabling people to work most effectively together in accomplishing objectives'.

An organization's structure must clearly state who is to do what and who is responsible for what results. Though an organization implies many meanings to many people, for most practicing managers, it means 'formalized intentional structure of roles or positions'. The food and beverage manager identifies the nature of work to be carried out in each area of the food and beverage department and identifies positions and draws job description for each, in liaison with the personnel manager to establish formal organization structure. The organization chart of Food & Beverage Service department is shown in figure 1.02.

MOTIVATIONAL QUOTE



SUCCESS TIP





.....Empowering Minds

SRI VASAVI INSTITUTE OF ENGINEERING & TECHNOLOGY(A)

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