

Technical Guide on Internal Audit of Petrochemical Industry

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Internal Audit Standards Board
The Institute of Chartered Accountants of India
(Set up by an Act of Parliament)
New Delhi

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E-mail : cia@icai.in

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Foreword

Petrochemical Industry is vital to economic growth as it provides link between natural resources and value added products. It is considered to be an “enabler” industry playing a critical role in functioning of all major sectors like, textile, agriculture, infrastructure, healthcare and consumer goods. Indian petrochemical industry is one of the fastest growing industries in India and is expected to grow by 7-8% with a major growth in industries such as, clothing, automobiles, etc. Major challenges faced by the Indian petrochemical industry are lack of low cost feedstock and dependence for technology.

Considering the unique nature of this industry, internal auditors can play an important role in helping to manage risks and optimize the operations in terms of revenue optimization, process optimization and cost reduction. I congratulate CA. Shiwaji Bhikaji Zaware, Chairman, Internal Audit Standards Board, and other members of the Board for bringing out this “Technical Guide on Internal Audit of Petrochemical Industry” which is an important publication providing practical and valuable guidance to internal auditors related to this industry. This comprehensive publication would surely help the members to understand and assess efficiency and effectiveness of both core and non-core business processes of the petrochemical industry, thereby apply best internal audit techniques and procedures.

I am sure that this informative publication will prove useful to the members involved in petrochemical industry in efficiently discharging their professional responsibilities as internal auditors.

October 29, 2013
New Delhi

CA. Subodh K. Agrawal
President, ICAI

Preface

Petrochemical industry is the primary source of synthetic materials that are essential to support the present level of human development across the globe. Indian petrochemical industry had a humble beginning in mid-sixties and since then the petrochemical industry in India has come a long way with global sized plants operating in few product categories not only meeting local demand but also exporting products to global markets. In such a crucial industry, internal audit has emerged as, “value added” function with the change in focus to operational and management audit instead of a routine transaction audit.

Keeping this in mind, the Internal Audit Standards Board of the Institute has issued this “Technical Guide on Internal Audit of Petrochemical Industry” which provides an overview of the processes and controls related to various activities involved in the petrochemical industry. The Guide has been divided in two parts. The initial chapters discuss the processes involved in production from hydrocarbons and then in subsequent chapters internal audit of various processes has been explained in detail. An overview of petrochemical industry in India has been given for various major segments and products such as, polymers, polyolefins, fibre intermediates, synthetic fibres, aromatics – paraxylene, surfactants, synthetic rubber, etc. The Guide explains various important technical aspects of petrochemical industry such as, capital and power intensive, continuous process industry, feedstock procurement and management, material balancing, safety and security, duties and taxes, and trade restrictions, etc. The Guide covers in detail internal audit aspects of procurement function, materials management, production process, contracts, plant maintenance, shutdown management, sales and distribution, insurance and legal compliance of various applicable statutes.

At this juncture, I am grateful to CA. K. S. Sundara Raman for sharing his experience and knowledge with us and preparing the draft of the publication for the benefit of the members. I am also thankful to Shri Sadagopan Sridharan for reviewing and providing valuable inputs on the Guide.

I wish to thank CA. Subodh Kumar Agrawal, President and CA. K. Raghu, Vice President for their continuous support and encouragement to the initiatives of the Board. I must also thank my colleagues from the Council at the Internal Audit Standards Board, viz., CA. Babu Abraham Kallivayalil,

Vice-Chairman, IASB, CA. Rajkumar S. Adukia, CA. Jay Ajit Chhaira, CA. Tarun Jamnadas Ghia, CA. Pankaj Inderchand Jain, CA. Nihar Nirranjan Jambusaria, CA. Dhinal Ashvinbhai Shah, CA. S. Santhanakrishnan, CA. J. Venkateswarlu, CA. Abhijit Bandyopadhyay, CA. Anuj Goyal, CA. Naveen N.D. Gupta, Shri Gautam Guha and Shri Manoj Kumar. I also wish to place on record my gratitude for the Co-opted Members on the Board *v/z*, CA. Ashok Patil Pundlik, CA. Chandrakant Raghunath Karode, CA. Rakesh Dhody, CA. Saurabh Mukund Chitale and CA. Sanjeeb Kumar Agarwal and Special Invitee, CA. Sanjay Arora for their invaluable guidance as also their dedication and support to the various initiatives of the Board. I would also like to place on record appreciation to CA. Jyoti Singh, Secretary, Internal Audit Standards Board and her team of officers for their inputs in giving final shape to the publication.

I am certain that the internal auditors connected to the petrochemical industry would find this Technical Guide immensely useful.

November 21, 2013
Pune

CA. Shiwaji Bhikaji Zaware
Chairman
Internal Audit Standards Board

Abbreviations

ATG	Automatic Tank Gauge
BOE	Bill of Export
BOL	Bill of Lading
C ₂	Ethylene
C ₃	Propylene
CBFS	Carbon Black Feed Stock
CMS	Cash Management System
CNF	Cost And Freight
CP	Continuous Polymerisation
CVD	Countervailing Duty
DCA	Del Credere Agent
DCS	Distributed Control System
DEPB	Duty Entitlement Pass Book Scheme
EDC	Ethylene Di Chloride
EIC	Engineer In Charge
FCS	Fast Collection Service
FDY	Fully Drawn Yarn (Flat Yarn)
FOB	Freight on Board
GRN	Goods Receipt Note
HNP	Heavy Normal Paraffin
IDP	Inter Divisional Purchase
IDS	Inter Divisional Sales
LAB	Liquid Alkaline Benzene
LDPE	Low Density Poly Ethylene
LLDPE	Linear Low Density Poly Ethylene
LNP	Light Normal Paraffin

LPG	Liquefied Petroleum Gas
LR	Lorry Receipt
MEG	Mono Ethylene Glycol
MPN	Material Pick Up Note
MRP	Material Resource Planning
OEM	Original Equipment Manufacturer
OX	Orthoxylene
PE	Polyethylene
PO	Poly Olefins
POY	Partially Oriented Yarn
PP	Polypropylene
PSF	Polyester Staple Fibre
PTA	Purified Terephthalic Acid
PTY	Polyester Filament Texturised Yarn
PVC	Polyvinyl Chloride
PX	Paraxylene
QC	Quality check
TOL	Truck Order Linking

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Chapter 1

Introduction

Objective and Scope of Technical Guide

1.1 The objective of this Technical Guide is to give internal auditor, an overview of the processes and controls on various activities involved in the petrochemical industry. The Guide gives an overview of different stages of producing the end product from different feedstock and covers the entire processes of Procure to Pay, Consume to Produce, Order to Cash, etc.

The contents are widely embracing the new methodologies in internal audit, focusing on "risk based audit approach" rather than a routine transaction oriented audit. The enormous capital that is put into by the entrepreneurs to operate such huge petrochemical plants in itself, suggests that a technical and economic appraisal of petrochemical spans several large subject areas requiring 'in depth" analysis for generating a meaningful and acceptable report by the internal auditors.

1.2 Keeping these in mind, the structure of this Guide is divided into two parts: the first five chapters discuss the processes in production from hydrocarbons, controls that are required, followed by standard internal audit check list to carry out in depth analytical study. The later chapters in Part-II concentrate on the ancillary support processes with a logical link to the production processes. The relevant chapters also contain the detailed procedures to be undertaken by the internal auditor in respect of each of the main aspects as well as the sub components thereof of petrochemical industry.

The illustrative flow charts of technical processes given in the Technical Guide aim to bring in better understanding for the readers.

Chapter 2

Petrochemical Industry – An Overview

Background

2.1 Petrochemical are synthetically produced products which are used for augmenting/ supplementing naturally occurring materials which are scarce e.g., synthetic rubber in the place of natural rubber, plastic packaging products, in the place of paper wood. Petrochemicals are organic in nature i.e., derived from natural resources such as, crude oil and natural gas.

The petrochemical industry of India is less than 40 years old. The sector has a significant growth potential. Although the current per capita consumption of petrochemicals product is low, the demand for the same is growing.

2.2 Compared to per capita consumption of PO + PVC in US at 67 kg., China at 32 kg and Brazil at 26 kg, India at 6.4 kg is still in nascent stage. US consumption has reached saturation level, china's consumption above industry curve is basically export led. India has the advantage of high population and expected to maintain high economic growth. This should propel the India's consumption in polymer to new levels in coming years.

Petrochemical Industry is a cyclical industry. This industry, not only in India but also across the world, is dominated by volatile feedstock prices and sulky demand. Feed Stock Management and Material Balancing are highly important as it is a continuous process industry.

2.3 The Indian petrochemical industry is a highly concentrated one and is oligopolistic in nature.

Petrochemical Segments and Products – Demand and Growth

2.4 Petrochemicals are derived from various chemical compounds, mainly from hydrocarbons. These hydrocarbons are derived from crude oil and natural gas. Among the various fractions produced by distillation of crude oil, petroleum gases, naphtha, kerosene and gas oil are the main feedstocks for petrochemical industry. Ethane, propane and natural gas liquids obtained from natural gas are the other important feedstock used in the petrochemical industry. The segment – wise products derived from the crude are as under:

Petrochemical Industry – An Overview

Segment	Intermediate Products	Merchant Products
Olefins Chain	Ethylene (C2)	LDPE - Low Density Poly Ethylene LLDPE - Linear Low Density Poly Ethylene HDPE - High Density Poly Ethylene PVC - Poly Vinyl Chloride PS - Poly Styrene EDC - Ethylene Di-chloride VCM - Vinyl Chloride Monomer EG - Ethylene Glycol EO - Ethylene Oxide DEG - Di- Ethylene Glycol MEG - Mono Ethylene Glycol TEG - Tri Ethylene Glycol
	Propylene (C3)	PP - Poly Propylene PPCP - Polypropylene Copolymer ACN - Acrylonitrile AMMS - Ammonium Sulphate ACTN - Acetonitrile EA - Ethyl Acrylate BA - Butyl Acrylate MA - Methyl Acrylate HCN - Hydrocyanic Acid PS - Poly Styrene EDC - Ethylene Di Chloride VCM - Vinyl Chloride Monomer
	Butadiene	PBR - Poly Butadiene Rubber
Aromatics Chain	C6 - Hexane C7 - Heptane C8 - Octane	BZ - Benzene OX - Ortho Xylene MX - Mixed Xylene PX - Para Xylene Toluene Sol CIX - Solvent CIX

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Segment	Intermediate Products	Merchant Products
		Hepton LAB - Linear Alkyl Benzene Cixon Styrene Caprolactum DMT - Dimethyl Terephthalate PTA - Purified Terephthalic Acid PR - Polyester Resin Polyester Chips PFY - Polyester Filament Yarn PSF - Polyester Staple Fibre PET - Polyethylene Terephthalate

2.5 The domestic polymer industry (like global industry) is dominated by polyolefin's (PE & PP), representing about 72% of all commodity resins consumed in 2010, Polymers registered demand growth of 4.6% in 2011 against growth of 12% in 2010. The demand for polymer is likely to grow by 12% and 8% in 2012 and 2013 and is expected to reach 8950 Kt and 9672 Kt respectively.

Polymers

2.6 Polymers registered a subdued demand growth of 4.6% in 2011. Demand from every major end-use segment has been affected in 2011 as the economy slowed down due to monetary and fiscal tightening for controlling inflation. Raffia, the largest end-user, has been hit by a drop in cement dispatches. Cement dispatches serve as an important indicator of manufacturing activity in the country. Growth in cement dispatches (m-o-m SA) picked up in December 2011 and grew at 5.9% as compared to -16.9% in the previous month. It has been falling since then and stood at 1.8 per cent in March 2012. Deceleration in commercial vehicles sales has hit PP copolymer sales. Commercial vehicles sales, another forward looking indicator of industrial activity, also paint a grim picture. Sales have remained more or less stagnant since October 2011 after a 22% growth in September 2011. Sales of commercial vehicles grew by just 0.8% in March 2012.

Petrochemical Industry – An Overview

Demand for polymers is expected to grow at 8% - 12% in 2012 and 2013. Recovery is likely to set in when interest rates, which have been raised 13 times since March 2010, are brought down and liquidity in the market increases. Polymer industry is expected to grow along with the economic growth of the country.

Polyolefins (PO)

2.7 Comprising PE and PP, Polyolefins constituted 79% of the total polymer capacity and production in India in 2011. All PE registered demand growth of 4.1% in 2011. It is expected that PE will grow at 7% approx. in 2012 and 2013 respectively.

(i) Vinyl's: PVC

The demand for PVC increased by 5.1% in 2011 and is expected to grow at 15% and 10% in 2012 and 2013 to reach 2271 Kt & 2498 Kt respectively. As the economy is expected to perform well with the easing of monetary policy and various PVC end use sectors performance improving, PVC demand is expected to be robust in coming years.

(ii) Styrenics - Polystyrene

In 2011, demand for PS increased by 12% to reach 264. Demand for PS is expected to maintain the same rate in 2013.

(iii) Acrylonitrile-Butadiene-Styrene (ABS)

Demand for ABS registered a growth of 8.2% in 2011. Further demand for ABS is expected to grow approximately at the rate of 9% – 10% in 2012 and 2013. Industry capacity is likely to remain unaltered at 87 KT till 2013.

(iv) Styrene-Acrylonitrile (SAN)

Demand for SAN registered growth of 9.5% in 2011. It is expected to grow at same rate in 2012 and 2013. There is no capacity addition expected till 2013.

(v) Ethylene and Propylene

Ethylene Capacity increased from 3730 Kt in 2010 to 4030 Kt in 2011. There was debottlenecking of 260 Kt by IOCL, Haldia – 25 Kt and GAIL – 15 Kt in 2011. Propylene capacity increased from 3833 Kt in 2010 to 3963 Kt in 2011, capacity debottlenecking by IOCL of 130 Kt. HMEL is expected to add 367 Kt by end of 2012 to reach 440 Kt by 2013. MRPL is expected to add 440 Kt of propylene capacity in 2013. In 2011, production of ethylene and propylene was 3355 Kt and 3560 Kt respectively. Production is expected to increase as the operating rates improve.

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(vi) Butadiene

The demand for butadiene registered a nominal growth of 0.8% in 2011. Demand is expected to grow at 2% in 2012. Demand for Butadiene is expected to jump by 50% by 2013 on back of new SBR and PBR plants coming up in 2013. There was an exportable surplus of 146 Kt in 2011, which is expected decline to 141 Kt in 2012 and 85 Kt in 2013 as the domestic demand for butadiene increases.

(vii) Styrene

India does not have any capacity for styrene and is fully dependent upon imports. For 2011, India's total demand for Styrene was 525 Kt and growth in styrene demand was at 11%. In 2012 and 2013, demand for Styrene is projected to grow at a rate of 11% to reach 585 Kt and 650Kt respectively.

(viii) EDC and VCM

Almost the entire production of EDC and VCM in India are consumed captively by the polymer manufacturers for production of PVC and hence, PVC manufacturers who do not have facilities for captive production of EDC and VCM have to rely entirely on imports to meet their demand for PVC building blocks viz., EDC and VCM..

Fibre Intermediates

2.8 In 2011, the combined production of fibre intermediates viz., ACN, Caprolactum, PTA and MEG reached 4614 Kt of which PTA and MEG constituted 76% and 21% respectively with ACN and Caprolactum together accounting for the remaining 4%.

PTA and MEG constituted 42% and 53% of the total 1579 Kt fibre intermediates imported in to India in 2011. Of the 70 Kt of fibre intermediates exported from India in 2011, the share of MEG was 85% and Caprolactum was 13%.

However, among the fibre intermediates produced in India in 2011, India's import dependency was highest for ACN where the quantum of imports (81 Kt) was more than double the 38 Kt produced domestically. The fibre intermediate sector registered a demand growth of 6% in 2011 and is expected to grow at 7.5% and 9% in 2012 and 2013 respectively. Acrylonitrile is expected to grow at 4%, PTA at 8% to 10% and MEG at 7% - 8% respectively in 2012 and 2013.

Synthetic Fibres

2.9 In 2011, the combined production of synthetic fibre (PSF, ASF, PPSF, PFY, PPFY, VFY, VFS and NFY) reached 3755 Kt against demand of 3367 Kt. The demand growth was at 13% in 2010 which declined to 1.9% in 2011.

It is expected that the fibre demand growth will be approx. 7% and 9% in 2012 and 2013. Expected import dependency of fibre is 3% - 4%. Further, there is capacity increase of 510 Kt and 824 Kt in 2012 and 2013, respectively.

Aromatics – Paraxylene

2.10 In 2011, PX demand increased by 3.5% and is expected to moderate at 2.1% in 2012 and then revive again to 8.7% in 2013. PX capacity was 2502 Kt in 2011. No new capacity is getting added in 2012 and 2013.

PX import was at 429 Kt in 2011 and it is expected to remain at same level in 2012 and 2013. PX export increased from 421Kt in 2010 to 662 Kt in 2011. Export is expected to increase significantly to 684 Kt in 2012 and 501 Kt in 2013.

Surfactants

2.11 Demand for key surfactants LAB and EO increased by 6.9% and 6.1% respectively in 2011. Demand growth for LAB is expected to be 6% in 2012 and 2013 as shown in table 17. Demand growth for EO is expected to be at 9.4% and 7.1% in 2012 and 2013.

LAB capacity is expected to remain unchanged till 2013. Imports expected to increase marginally to meet the increase in domestic consumption. LAB export is expected to decline marginally from 98 Kt in 2011 to 95 Kt in 2012 and 85 Kt in 2013, as domestic consumption increases.

Synthetic Rubber

2.12 SBR demand registered a robust growth of 18% in 2012, followed by EPDM demand growth of 14%. PBR/ NBR/ SBR demand is expected to grow at 6% in 2014. EPDM demand is expected to grow at 8.1% and 11% in 2013 and 2014, respectively.

Other Key Petrochemicals

2.13 Some other key petrochemicals are as follows:

(i) Benzene

Benzene demand is expected to grow at 3.7% in 2012 and 2013. It is expected that Benzene export will be 521 Kt in 2012 and 558 Kt in 2013. Import is expected to be 50 Kt in 2012 and 2013.

(ii) Toluene

Toluene demand registered growth of 5.7% in 2011. Toluene demand is expected to grow at 6.5% and 5.6% in 2012 and 2013. Toluene import was at 230 Kt in 2011 and is expected to increase to 254 Kt in 2012 and 276 Kt in 2013.

(iii) MX

MX demand grew at 12% in 2011 and is expected to grow at 27% in 2012 and at 9% in 2013. There is no new capacity addition and production is expected to fall short to meet domestic demand. The increase in domestic demand is expected to be met by imports. Imports expected to be 40 Kt and 46 Kt in 2012 and 2013.

(iv) OX

OX demand registered a negative growth rate of -7% in 2011 after registering demand growth of 8% in 2010. There is no new capacity addition. Demand is expected to touch 263 Kt and 282 Kt in 2012 and 2013.

Outlook of Indian Petrochemical Industry*

2.14 India's aggregated demand for petrochemicals expected to grow by 7-8% in 2013. Polymers are likely to register growth rate of 12% and 8.1% and olefins at the rate of 6.5% and 5.5% in 2012 and 2013.

Fibre Intermediates are projected to grow at 11% in 2013 and 2014. Synthetic fibre demand expected to register growth in the range of 5% to 8% in next two years.

Surfactants are projected to grow at approx 5% in 2013 and 2014. Carbon Black/ CBFS to grow at approx 9% in 2013 and 2014.

* Source: APIC 2013 Country Paper from India (by Chemicals & Petrochemicals Manufacturers' Association).

Petrochemical Industry – An Overview

Elastomers expected to register demand growth in the range of 6% to 7% in next two years. Other key petrochemicals expected to grow at approx 8.5% in 2013 and 2014.

India's demand from the automobiles, packaging, agriculture and infrastructure sector is expected to grow at healthy rate with easing of governments monetary policy. This optimism is based on the expectation that India's GDP would again grow at 6% plus in 2013 after hitting a low of 5% in 2012.

2.15 Though the Indian petrochemical industry is highly dominated by only a few players, however, there are a number of petrochemical companies in India, doing their share of business. Based on their market share, top 10 companies can be listed as below:

- (i) Reliance Industries Ltd.
- (ii) Indian Oil Corporation
- (iii) Haldia Petrochemicals Ltd.
- (iv) Gas Authority of India Limited
- (v) HPCL-Mittal Energy Ltd. (HMEL)
- (vi) Chemplast
- (vii) Finolex
- (viii) Mangalore Refinery and Petrochemicals Ltd (MRPL)
- (ix) DCW Ltd.
- (x) Shriram

Chapter 3

Technical Aspects of Petrochemical Industry

3.1 The special features/ complexities peculiar to the petrochemical industry are enumerated below:

(i) **Capital and Power Intensive**

(a) Petrochemical industry is highly capital intensive and complex involving huge investments with long term gestation period. The criticalities involved in such a projects are:

- cost segregation studies
- process improvement and construction assessments
- real estate, machinery and equipment valuations
- business and intangible asset valuations
- fixed asset management

(b) Internal audit will have to concentrate, *inter alia*, on

- construction audits, construction project controls reviews, and allocation of purchase price analyses of major capital acquisitions and improvements
- Cost overrun due to project delay, if any and it, monitoring by the management during the project stage
- Project tax planning
- Purchase price allocations

(c) Many petrochemical plants will necessarily include captive power plants as a part of its complex to cater to the high capacity power supply required to carry out the continuous process.

- The objective of reducing energy costs and consumption should be the scope for internal audit in such case of CPP units.
- The study should also include effectiveness of utilization of power and the cost benefit on generation vis-à-vis procurement through government sources.

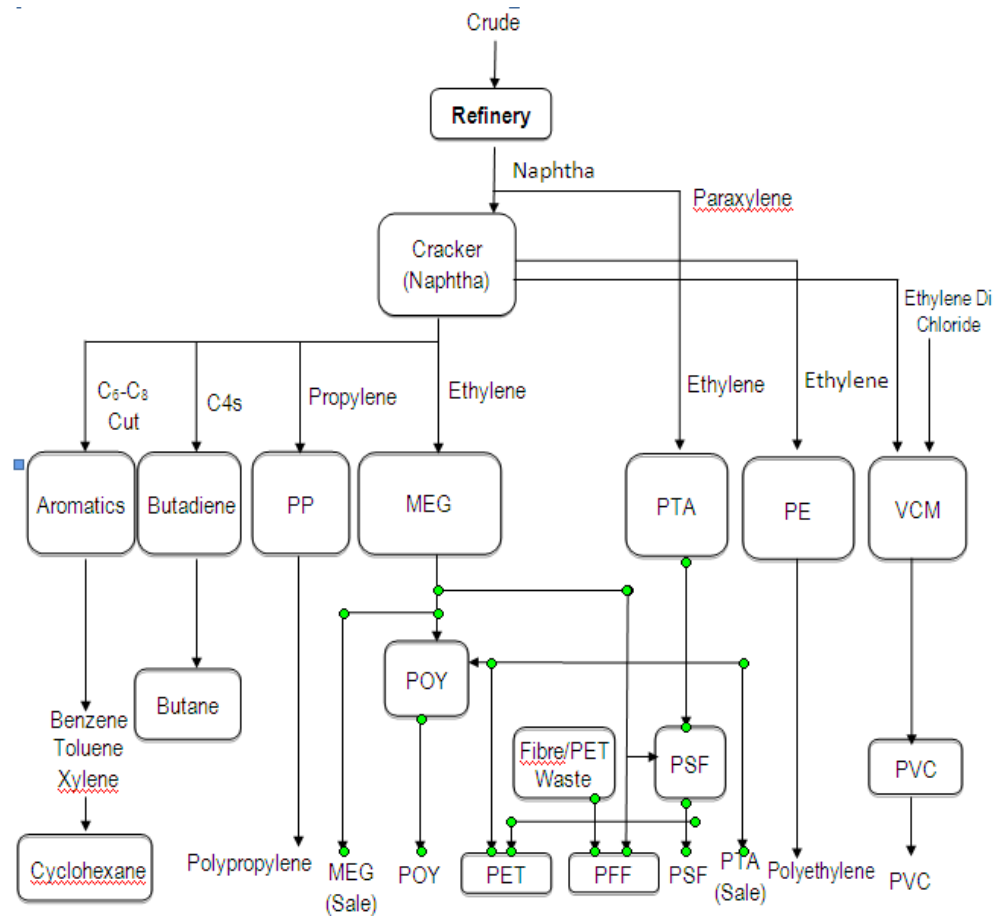
Technical Aspects of Petrochemical Industry

- (ii) **Continuous Process Industry**
- (a) Petrochemical industry comprises of a chain of integrated manufacturing units commencing from petroleum product plants (generally, referred to as Crackers) to downstream petrochemical units.
- (b) The raw material for crackers (feedstock) consist of two types of products:
- Naphtha (a derivative product of crude oil)
 - Natural Gas
- (c) Naphtha is extracted from crude oil, and natural gas is sourced from gas wells. Due to shortage constraints of crude oil, most of the new petrochemical industries use natural gas as feedstock.
- (d) The feedstock is "cracked" in the Cracker Plant to produce intermediate products such as, ethylene and propylene. These intermediates are supplied on a continuous basis to all the downstream units. The nature of industry is continuous process as both the crackers as well as the downstream plants operate on a continuous basis on a 24x7 basis. Any stoppage of any downstream unit calls for stoppage of the naphtha/ gas crackers.

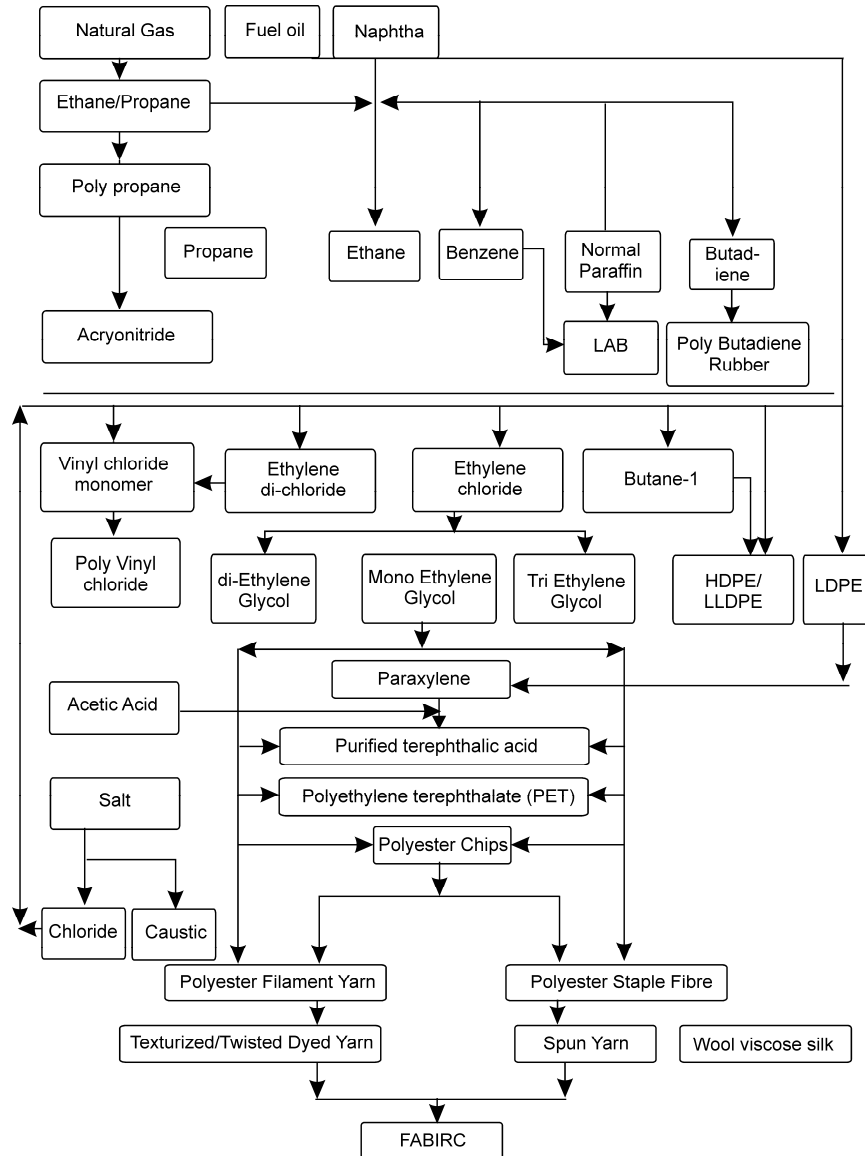
The Product flow diagram for typical naphtha based and gas based petrochemical plant is depicted below.

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Product Flow Petrochemical Manufacturing



Petrochemical Complex – An Overview



Technical Guide on Internal Audit of Petrochemical Industry

(iii) Feedstock Procurement and Management

Volatility of Crude and Feedstock price - pricing and realisation dependent on crude and naptha prices.

(iv) Material Balancing

(a) Yield Variance

- In a continuous process industry where materials traverse from Mother Plant to other ancillary plant under different process chains, the most critical factor is to look at the three basic categories: materials in, materials out and materials stored. Material balancing in liquid/ gaseous form of materials (as against solid) is complex in ascertaining the right yield as per standards due to operation of multiple variable parameters like, temperature, pressure and density.
- A major factor in industry is, of course, the value of the materials. It is important that expensive raw materials should be considered and monitored for yield optimization, loss/ waste minimization.
- In large production units, the process variances are taken care of through innovative system like IP21 (Info-Plus 21 – software to view the periodical trends/data of streams), Sigmafine (Oil Accounting Software). Sigmafine resolves inconsistencies between plant measurements and generates uniform mass balance for the entire complex. The flow of materials is captured through Automated Tank Gauge (ATG) installed at the respective measurable point of the plant/ tanks/ pipes.
- Material Balancing Report, Plant Performance Report will be configured through integrated system to generate periodical reports to analyse variations for taking desired preventive/ corrective actions to improve the yield.

(b) Quantitative Reconciliation

- Quantitative accounting and reconciliation covers the entire gamut of material movement right from the receipt of the raw material into the factory premises to the dispatch of the finished products.

Technical Aspects of Petrochemical Industry

(c) Internal Audit

- The role of internal audit is, therefore, to review and identify various check points and to validate the existence of proper system controls, to ensure that the report produces the meaningful data for the management to take appropriate corrective actions. The audit scope will include review of following aspects.
- Procedure followed for raw material accounting and reconciliation.
- Process of inter unit and WIP material stock accounting and reconciliation.
- Procedure for Inter – Divisional Sale (IDS)/ Inter – Divisional Purchase (IDP) accounting and reconciliation arising out of chain costing of various joint products emerging from various continuous processing.
- Procedure for finished goods accounting and reconciliation

(v) Safety and Security

Hazardous processing requiring very stringent safety procedures and protection of environment from discharge of hazardous chemicals.

(v) Duties and Taxes

Import tariff provides a price arbitrage. The present tax structure is as follows

- | | | |
|----------------------|---|------------------------------------|
| (i) Custom duty | - | 5% |
| (ii) CVD | - | 10.3% (including 3% Cess) |
| (iii) Additional CVD | - | 4% |
| (iv) Cess | - | 3% of Custom Duty & Additional CVD |

Since the CVD & Additional CVD are CENVARIABLE, it works out to effective import duty of 5.53% which provides price arbitrage in the domestic market.

(vii) Trade Restrictions

There is anti-dumping duty on import of PVC from various countries. While a few countries like Oman, Singapore and Saudi Arabia are filing for anti dumping, Indian Domestic industry has initiated anti-dumping duty application for protection from imports originating from USA, Korea and Taiwan.

Chapter 4

Internal Audit - Concepts

4.1 With increasing complexities in business, rapid growth and number of regulatory requirements, activities of a petrochemical industry have undergone various changes in processes and systems. Effective internal audit provides a tool to ease out all complexities and acts as fuel to wholesome improvements in systems and processes and, therefore, in growth and sustainability.

"Preface to the Standards on Internal Audit", issued by the Institute of Chartered Accountants of India defines the term *"Internal Audit"* as:

"Internal audit is an independent management function, which involves a continuous and critical appraisal of the functioning of an entity with a view to suggest improvements thereto and add value to and strengthen the overall governance mechanism of the entity, including the entity's strategic risk management and internal control system. Internal audit, therefore, provides assurance that there is transparency in reporting, as a part of good governance".

Scope of Internal Audit

4.2 The scope of internal audit encompasses the examination and evaluation of the adequacy and effectiveness of the organization's internal control systems. It includes:

- (i) Reviewing compliance with policies, plans, procedures, laws, and regulations.
- (ii) Reviewing the reliability and integrity of financial and operating information, and the means used to identify, measure, classify, and report such information.
- (iii) Reviewing the means of safeguarding assets and, as appropriate, verifying the existence of such assets.
- (iv) Review that revenue generating assets are judicially utilized.
- (v) Identify, quantify and report on cost saving measures.
- (vi) Process and revenue optimization.

Internal Audit Team

4.3 The internal audit Team should comprise of individuals with sufficient knowledge, skills and experience in a multitude of disciplines. A sufficient number of persons possessing the requisite degree of proficiency in the relevant disciplines are a major determinant of the effectiveness with which an internal audit of petrochemical industry will be performed. The Internal audit team should comprise of both in-house and outside internal auditors partnering with it. While in-house team will conduct special review of processes and controls to strengthen them, outsourced external firms will support in carrying out transaction audit of all functions of the organisation leveraging on industry knowledge. The primary objective of the internal audit team will be to help the organization to accomplish its objectives by bringing a systematic disciplined approach to evaluate and improve effectiveness of risk management, internal controls and governance processes.

4.4 The Institute of Chartered Accountants of India has, till date, issued 18 Standards on Internal Audit (SIAs) which codifies the best practices in the field of internal audit. These standards are aimed to increase the overall credibility, consistency, clarity and work performed by the internal auditors. The following is list of Standards on Internal Audit (SIAs) issued by the ICAI, till date:

SIA 1	Planning an Internal Audit
SIA 2	Basic Principles Governing Internal Audit
SIA 3	Documentation
SIA 4	Reporting
SIA 5	Sampling
SIA 6	Analytical Procedures
SIA 7	Quality Assurance in Internal Audit
SIA 8	Terms of Internal Audit Engagement
SIA 9	Communication with Management
SIA 10	Internal Audit Evidence
SIA 11	Consideration of Fraud in an Internal Audit
SIA 12	Internal Control Evaluation
SIA 13	Enterprise Risk Management
SIA 14	Internal Audit in an Information Technology Environment
SIA 15	Knowledge of the Entity and its Environment
SIA 16	Using the Work of an Expert
SIA 17	Consideration of Laws and Regulations in an Internal Audit
SIA 18	Related Parties

Chapter 5

Internal Audit – Procurement Function

Direct Charge Materials

5.1 Materials, the consumption of which is directly proportionate to the production of finished goods are referred to as direct charge materials. In petrochemical industry direct charge materials are:

- (a) Feedstock
- (b) Chemicals and Catalysts
- (c) Packing and Packaging materials

The key procurement strategy for each category of material has been discussed in following paragraphs:

Feedstock

5.2 Feedstock or raw materials for petrochemical products are mainly various grades of crude oil, like, C₂, C₃, Naphtha, Kerosene, etc. and Natural Gas. These materials are not freely available in the market because of supply constraint and strict Government regulations on some materials, like, kerosene and natural gas. Pricing of these materials is either government regulated or dependent on pricing published in International publications, like, Platts. Prices are derived from markets in USA, Middle East and Singapore.

5.3 Typical procurement strategy includes term contract for fixed quantity with formula pricing and spot contracts for remaining requirement. Since most of the feedstock are imported, marine logistic is very crucial for getting the desired quantity at the right time at the port. This makes the whole logistic process very complex. Apart from this, wrong planning in logistic may result in heavy demurrage. Feedstock procurement strategy includes following:

- (a) Availability of different grades of Crude
- (b) Market price of feedstock
- (c) Quality of feedstock
- (d) Political stability of oil producing nations

Internal Audit – Procurement Function

- (e) Shutdown/ breakdown at supplier's plant
- (f) Availability of vessels
- (g) Storage facilities
- (h) Price movement of finished products
- (i) Technological constraint of Petrochemical plant.

5.4 Internal audit aspects related to feedstock procurement are as follows:

(a) Term Contracts

- (i) Verify contract approvals.
- (ii) Verify vendor approvals.
- (iii) Ensure adherence to contract clause.
- (iv) Verify documentary evidences for completion of transaction.
- (v) Check calculation and approval of liability and due date.
- (vi) Verify timely payment of liability.
- (vii) Check recordings of negotiations for various deals with documentary evidence.
- (viii) Review timely accounting for provisional invoices.
- (ix) Review of pending purchase orders.
- (x) Review of system of payment to vendors.

(b) Spot Contracts

- (xi) Verify contract approvals.
- (xii) Verify vendor approvals.
- (xiii) Review deal rationale and approval thereof.
- (xiv) Ensure adherence to contract clause.
- (xv) Verify documentary evidences for completion of transaction.
- (xvi) Check calculation and approval of liability and due date.
- (xvii) Verify timely payment of liability.
- (xviii) Check recordings of negotiations for various deals with documentary evidence.
- (xix) Review timely accounting for provisional invoices.

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- (xx) Review of Pending Purchase Orders.
- (xxi) Review of system of payment to vendors.

(c) Demurrage

- (i) Verify demurrage claims.
- (ii) Check demurrage calculations.
- (iii) Verify final liability.
- (iv) Check approval for payment.
- (v) Review payment of demurrage and accounting for demurrage.
- (vi) Review of system of payment to vendors.

(d) Freight/ Insurance

- (i) Verify freight calculation.
- (ii) Review of insurance coverage and insurance premium payment.
- (iii) Review analysis of time charters and their utilisation.
- (iv) Check dead freight analysis.
- (v) Check payment of freight and approval thereof.
- (vi) Verify debit notes/ credit notes.
- (vii) Review accounting for freight paid.
- (viii) Review of system of payment to vendors.

(e) Imports- Remain on Board/ Ocean Loss/ Quality give away

- (i) Verify surveyors report and other documents to identify ROB qty, ocean loss and quality give away.
- (ii) Verify claims lodged and collection thereof on account of remain on board/ ocean loss/ quality give away.
- (iii) Review of system of payment to vendors.

(f) Brokerage/ Commission/ Bunker/ Surveyors Fee/ Port Charges

- (i) Verify payments made and approval thereof for port charges, commission, brokerage, surveyors fees, etc.
- (ii) Verify approval for empanelment of brokers, agents and surveyors.

Chemicals and Catalysts

5.5 Chemicals and catalysts includes bulk chemicals, catalysts, additives and other chemicals required for making different types of petrochemical products and various grades in the same product range. Procurement strategy for bulk chemicals like, EDC, Acetic Acid, Methanol, Butane, etc. is similar to feedstock procurement. Variation in the pricing of these bulk chemicals affects product contribution. When the prices of these chemicals become volatile, business consent is taken before making procurement. Prices of these materials are generally tracked through international publications like, Platts, Harriman and ICIS.

5.6 Procurement of catalysts, additives and other chemicals are based on production planning of specific products in the product portfolio. Hence, procurement department procuring these material has to work in close coordination with Plants and Marketing Group. Marketing group makes changes in production plans based on quality assessment of the product from the market and demand-supply situation. Procurement department has to prepone/ postpone procurement of these chemicals based on the decision taken by the marketing team. Some of these chemicals have shelf life which makes these chemicals useless and hazardous after specific period of time. Hence, action needs to be taken quickly to defer deliveries or resale these chemicals in case of change in production plan or sudden breakdown in the plant.

Packing and Packaging Materials

5.7 Petrochemical industry produces varied products in both solid and liquid form. Liquid products do not require any packaging for sale or storage. These products are stored in tankages and dispatched through tankers. However, solid products are in powder, granular and fiber form. Packing materials for these products includes plastic bags, paper bobbins, corrugated boxes and pallets. Procurement quantities and delivery schedule of paper based packing material is critical because of their short shelf life. Generally, plant maintains 15 days inventory of these materials. Different coloured paper bobbins are used for different denier of fiber for identification purpose. Therefore, specific coloured bobbin is required from supplier. Slight change in colour makes it unusable. Rejection of these types of materials is very high.

Engineering and Maintenance Materials

5.8 Engineering and Maintenance materials are required to keep the plant running with minimum downtime. Petrochemical plants being continuous processing plants requires periodic preventive maintenance to give maximum throughput. Moreover, petrochemical plant processes hazardous chemicals at very high temperature. Hence, safety cannot be compromised in these plants. Proper maintenance with best in class spares is vital for environment and safety of the people in and around the plant.

5.7 Engineering and Maintenance materials can be further classified into spares and consumables.

- (a) Spares are generally procured from Original Equipment Manufacturer (OEM) so that performance of the equipment is optimum. Prices are, generally, dictated by OEM unless commitment of larger volume is made. Consumption of these spares is also unpredictable and may not be required for many years. However, stock of critical spares (also called insurance spares) needs to be maintained at plant in case of breakdown of equipment. Some of the spares can be refurbished and used again.

Visibility of installed quantity of these spares across plant helps in optimizing procurement.

- (b) Consumables includes greases, lubes, bearings, etc. having low value and high consumption. These are basically "C" category items. These are procured in bulk to get better discounts.

5.9 The internal audit scope with respect to the procurement would include the following:

- (i) Verify whether purchase order has been correctly prepared as per the agreed terms at the time of negotiation and as per the agreed quotation.
- (ii) Verify whether appropriate tax codes are used while preparing the purchase order.
- (iii) Review of vendor development process.
- (iv) Review of competitive quotations and rate negotiation process.
- (v) Review of delivery scheduling process in relation to inventory levels.
- (vi) Review of receipt of imported consignments and shortage recovery process.

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- (vii) Review of commercial terms and conditions.
- (viii) Review of rejections.
- (ix) Transaction and process review of purchase requisition/ indents.
- (x) Review of commercial controls in procurement process.
- (xi) Review the packaging types and methodology.
- (xii) Review inventory status vis-à-vis procurement.
- (xiii) Review of delivery schedule tracking.

Chapter 6

Internal Audit – Material Management

6.1 Inventory refers to a firm's resources that can draw economic income, including raw materials, work-in-progress, finished goods, consumables and stores. Inventory management involves determining the optimal level of a firm's resources and planning the processes to achieve it. Good inventory management contributes to the firm's overall goal of maximizing its profits.

(a) Cost Minimization

Inventory management aims to meet a firm's inventory needs at minimum cost. This involves keeping just enough inventories to achieve business goals. For example, if a company has exceeded its customer satisfaction level target, it could reduce the amount of inventory it keeps. If a business aims to deliver its products within a certain number of days from the order placement, it should consider the location of its inventory, taking account of shipping times and costs.

(b) Forecasting

A firm that can accurately forecast demand for its products can plan its inventory more efficiently. Demand forecasting helps the firm manage inventory, capacity and finances better and improves its customer service. A demand forecast can use historical data, estimates or both. The more data is available for forecasting, the more accurate the results will be. A firm can forecast demand over short, medium or long periods of time, but generally, short term forecasts will be more accurate.

(c) Supply Chain Management

Inventory management extends outside the firm to involve the entire supply chain, which includes all the activities, processes and resources from the time the firm determines the need for materials until the customer receives the product.

6.2 Supply chain management requires managers to consider the big picture, including those elements that exist outside the firm such as, suppliers, partners and alliances. Supply chain management seeks to achieve quick response to customer needs, to minimize costs through integration and coordination, to simplify processes and to use information and technologies effectively.

Internal Audit – Material Management

Materials are categorized into various types as under:

- (i) Finished Goods, Traded Material and Raw Material
- (ii) Spares
- (iii) Catalysts and Chemicals
- (iv) Packing Material
- (v) Project Material
- (vi) Laboratory Chemicals

6.3 In case of spares, there is a sub – category of Mechanical, Electrical and Instrumentation spares. Materials are also categorized into:

- (i) Insurance category
- (ii) Critical category
- (iii) General category

6.4 The following areas have been covered in the broad function of Materials Management:

- (a) Maintenance of Material Master
- (b) Annual Materials Planning
- (c) Process of Materials Requisitions creations/ release
- (d) Receipt Process of Materials
- (e) Issue Process of Materials
- (f) Stocking at Warehouse
- (g) Insurance spares management
- (h) Rejections handling
- (i) Obsolete and Surplus Management
- (j) Fixations of Various MRP levels

A brief write up on each of the above function and the related internal audit aspects has been discussed in following paragraphs.

Maintenance of Material Master

6.5 Material Master Management refers to the process of registering a material that would get used in the course of purchase, production, packing, sales, testing, trading and maintenance. It involves creation and maintenance

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of a database of materials in the system. Material master management process also involves, besides creation of the master, carrying out changes to the master data based on the changes that are taking place with regard to the material.

6.6 Material Master Data contains essential information about the material as mentioned below that are required during the course of business, such as:

- (i) Material code
- (ii) Description of the material
- (iii) Type of the material (Finished goods, packing material, spares, etc.)
- (iv) Material Group to maintain the group identity, wherever applicable
- (v) Basic Unit of Measure
- (vi) Location of the material.

6.7 Material Master Management involves the following functions:

(a) Creation of Material Code

Various fields that are required during material code creation are as follows:

- (i) Material Description
- (ii) In case of spares, the details of parent equipment like, Manufacturer name, model No., Installed quantity , MRP Controller, UOM, Procurement Lead Time, etc
- (iii) Shelf Life of the material
- (iv) Maintenance of Excise Tariff ID/ Customs Tariff Id/ Sales tax/ VAT rates
- (v) Unit rate

Based on the above fields, a material code is created in the system. Generally, the rights for code creation are restricted and centralized

(b) Extension of Material Code (From One Location to Another)/ Changes to the Material Code

Generally, the codes are created specific to one location/ site. Based on request from users the codes are extended to other locations/ sites. Based on the inputs from the users the specification of material codes is changed.

(c) Blocking of the Material Code

Material codes that duplicate are identified and are blocked for further usage. Inventory lying in such codes is also transferred to the other operating/ live code.

6.8 The following internal audit aspects need to be reviewed:

- (i) Review the process for material code creation covering the authorizations/ approval process.
- (ii) Review the process in place for reviewing the existing codes before new material code creation.
- (iii) Review the pending PR/ PO in the operating code, for items for which the stock is available in the duplicate codes.
- (iv) Review the process for updating of various MRP parameters with regard to inventory status viz, slow moving, non-moving, surplus, obsolete and insurance items.
- (v) Review the process for flagging items as per Propriety Article Certificate (PAC) items. Report all cases where any item flagged as per PAC is being supplied by any other supplier other than the PAC supplier.

Annual Materials Planning

6.9 The Annual Marketing plan gets converted into annual production plan. Based on the recipe of each finished product, the annual material requirement is ascertained for each of the chemicals/ catalysts/ raw materials/ packing materials and accordingly annual procurement budget is prepared.

The annual production plan gets converted into periodic Rolling Plan. The same is realigned with the changed marketing forecast.

Based on the periodic Rolling Plan, the annual PR is raised or planned orders are created with schedule of delivery. The following internal audit aspect needs to be reviewed:

- (i) Process in place to ensure that amendments in the rolling Production plan after creation of planned order are communicated to the inventory Controller for cancellation of PO/ Deferment of Deliveries.
- (ii) Process in place to ensure that any unplanned shutdown is separately communicated to MRP Controller/ site Inventory Controller.

Process of Materials Requisitions Creations/ Release

6.10 Requisition for purchase of material (hereinafter referred as "PR") is raised by the users and after the process of approval; the procurement action is initiated against these requisitions. Based on the categories of material the requisition creation process is defined.

- (a) In case of Chemicals/ Catalysts/ Raw Materials/ Packing Materials, the PR's are generally raised for annual requirements based on annual production plan. In case of some organizations, for major raw materials, the PR is not raised and directly orders are placed based on Production Planning.
- (b) In case of Spares following are important aspects:
 - (i) If the item is a stock controlled item, the PR is raised by the stores based on levels (reorder level/ safety Levels).
 - (ii) If the item is not a stock controlled item, the PR is raised by the MRP controller based on requirement.
 - (iii) If the item to be procured is marked as non moving, the PR creation is restricted and only with necessary system based clearances/ approvals the PR can be raised by the users.
 - (iv) If the item to be procured is marked as duplicate, the PR has to be raised by the user in the operating material code.
- (c) In case the item is required on emergency basis, an emergency PR is raised.
- (d) The PR is approved by various authorities and thereafter procurement action is initiated.

6.11 The following internal audit aspect and need to be reviewed:

- (a) Review the controls in place to prevent PR creation for items lying as non-moving.
- (b) Review the controls in place to prevent PR creation for items marked as duplicate/ marked for deletion.
- (c) In case of annual PR's, review the schedule of delivery to validate that the same commensurates with the monthly production plans.

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- (d) Review the preventive controls in place to prevent excess PR quantity (like, Bill of Materials based controls, Maximum stock level based controls and authorizations based controls).
- (e) Review the controls in place to prevent the PR creation in excess of available budget.

Receipt Process of Materials

6.12 Material receipt at stores consists of the following sub-processes :

- (a) Unloading of incoming material
- (b) Generation of Goods Receipt Note
- (d) Quality inspection of incoming materials
- (e) RCA – Rejection/ wrong supply
- (f) Other receipts

6.13 Incoming materials is segregated into “Inspection” and “Dock to Stock Goods”. Materials to be stocked/ consumed without inspection are called dock to stock materials. The dock to stock items includes consumables and commodities that are backed by vendor certified service level agreements.

Selection of these items will also be based on an analysis of their historical quality level. Items with consistently high quality of receipt (99% and above) are included in dock-to-stock category.

Critical items are identified based on the item master details on Inspection note.

Normally, critical spares shall not be identified as dock to stock item.

PSM critical items will be tagged with different colour tag for separate identification.

6.14 The following process is normally followed for acknowledging the receipt of material:

- (a) The following documents are checked
 - (i) Delivery challan/ Invoice copy
 - (ii) Lorry receipt
 - (iii) Vehicle fitness certificate
 - (iv) Other Forms if any

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- (b) Unloading of Materials
 - (i) Material Handling Equipments are arranged in case of heavy materials, if required.
 - (ii) In case of Catalysts and Chemicals weight is taken to arrive Net Weight
 - (iii) Invoice is validated from excise view point.
 - (iv) Material is unloaded at respective location.
 - (v) The damages of packages, if any, is checked.
 - (vi) Open delivery certificate/ signature of driver on Lorry Receipt is taken in case if damages are found.
 - (vii) The receipt of materials is acknowledged on the LR and the truck is released from stores/ plant.
 - (viii) The received material is tagged/ labeled.
- (c) Counting of Materials
 - (i) The physical quantity of material is tallied with the challan/ invoice.
 - (ii) Record the discrepancy, if any. (short/ excess/ damage etc..)
- (d) Creation of Goods receipt Note
 - (i) Physical quantity received, shelf life unloading location system generated batch nos are uploaded in the system, and Goods Receipt Note (Inspection Note) is generated.
 - (ii) Discrepancy Note is printed in case of excess/ short/ damage items receipt (OSD).

6.15 The following process is, normally, followed for inspection of the material received:

- (i) Pending inspection notes list is taken for concerned inspection/ quality control/ authorized engineer.
- (ii) Material is inspected with respect to PO specifications/ MERI/ TC, quality report from central lab
- (iii) Based on inspection results the material is accepted/ rejected.
- (iv) The inspection clearance is recorded in system as usage decision with quantity accepted. In case of rejection, rejected, quantity is entered as return delivery.

Internal Audit – Material Management

6.16 The following process is, normally, followed for handling the rejection of material:

- (i) Reasons for rejection like, wrong supplier selection, improper specification, laboratory tests, etc., are investigated and corrective measures are taken in case of poor quality.
- (ii) Reason of damage/ shortage like poor packing , improper material handling, theft, short packing at transportation, etc. are investigated for preventive measures in case of shortages/ damages.

6.17 The following internal audit aspects needs to be reviewed:

- (i) Review the process for preparation of GRN including acceptance (UD) and report all cases of delay beyond reasonable period. It is also important to report on MRRs lying open for more than 30 days.
- (ii) Review action plan for usage/ disposal of excess/ rejected material. Report all cases where rejected material is lying for more than 30 days of rejection.
- (iii) Review the process for re-acceptance of rejected materials and report cases where materials are re-accepted without appropriate management approval and/ or after substantial delay.
- (iv) Review the process for tracking movement of truck/ tankers entering inside complex for unloading the bulk/ non-bulk material. Report all cases where time gap between entry of truck inside complex (TPN) and final exit (MGX) is not normal.
- (v) Review the process of material procurement on freight to pay basis and report exceptions where material is lying at transporter's Godown for more than 10 days.

Issue Process of Materials

6.18 Material issue takes place against reservation. The reservation for issue of spares can be created against cost centre or against a work order, and for issue of chemicals the reservation can be created against a process order.

Against open reservations, material is taken out from the BIN location and is delivered to the respective user. Receipt of the material by the user is acknowledged on the Issue note and Material Issue Note is closed in the system.

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Material is sometimes issued during silent hours. The Security Officer joins the Plant Engineer (User) for issue during silent hours and separate records are maintained for such issue. The same is regularized by stores in system next day morning. Monthly MIS of silent hour issue and personal delivery is circulated to HOD materials and HOD CES. Material is returned by creating a material return reservation in the system. All returned material is certified for usability by authorized persons. The inspection cell at the stores inspects all returned material to check its usability. Defective/ repairable items returned from plant are stored separately in stores. In case of chemical and catalyst, at the time of issue from stores, the material is stock transferred to the shop floor of the plant and based on actual consumption; the consumption posting is done in system. In case of engineering spares, the material is directly charged off to consumption at the time of issue from stores to plant.

6.19 The following internal audit aspect needs to be reviewed:

- (i) Review the system for open reservations review of more than 30 days old.
- (ii) Review the process of testing and accepting of materials returned by plants to stores. Report all cases where plant returns materials after lapse of considerable time.
- (iii) Review the system for monitoring the storage and issue (on FIFO basis) of chemicals having shelf life and report all cases of shelf life expired chemicals. Review the system of maintenance of shelf life data in SAP.
- (iv) Review the process for monitoring the materials/ chemicals lying at shop floor and report all cases where materials are lying at shop floor for more than 15 days.

Warehousing

6.20 Material stocking is done in an area of the complex generally referred to as the "Central Stores". Warehousing covers the following activities:

- (i) Binning
- (ii) Perpetual Verification of Inventory
- (iii) Preservation of Material

Internal Audit – Material Management

6.21 The following areas need to be reviewed:

(i) Binning

- (a) Review the process of storage of material in appropriate locations on receipt.
- (b) Review the system of updation of storage location data in the stores database at the time of receipt/ issue of material.

(ii) Perpetual Verification of Inventory

- (a) Review the process of segmentation of items for assessing the frequency of Perpetual Inventory Verification.
- (b) Review of adherence to perpetual verification schedule.
- (c) Review the system in place for addressing discrepancies.
- (d) Review the action taken against discrepancies identified during physical verification.
- (e) Review of MIS in place for perpetual verification.

(iii) Preservation of Material

- (a) Review the preservation system in place for different categories of items.
- (b) Review the adherence to the pre-defined preservation schedule.
- (c) Review the MIS in place for identification of preservation status of all items.

Insurance Spares Management

6.22 Insurance Spares Management comprises following activities:

- (i) Insurance/ critical Spares identification based upon criticality should be high, predictability of failure should be low, and expected usage of the spare should be low.
- (ii) Insurance/ critical spares review on a continuous basis to ascertain their status. The responsibility for identifying and level setting of insurance/ critical spares lies with plant while maintaining stock lies with the Plant Engineer. New insurance spare identification is done based on management guidelines.

6.23 The following internal audit aspects needs to be reviewed:

- (i) Review system for classifying spares as insurance spares and report

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all cases where any material has been declared as insurance material without approval of site head.

- (ii) Review the accounting treatment for procurement and consumption of Insurance Items.
- (iii) Review the NIL stock insurance spares and the stand by arrangements available to meet any eventuality arising out of nil stock of insurance spares.

Rejection Handling

6.24 The following areas need to be reviewed during internal audit:

- (i) Review the process for intimating the vendor in case of rejections.
- (ii) Review the process of intimation to accounts and follow up in cases where advance payment has been made.
- (iii) Review the process of return of rejected items to vendor.
- (iv) Review the process for re acceptance of rejected items.
- (v) Review the storage of rejected items in stores and ensure that they are stored separately.
- (vi) Review of Inventory of rejected items lying in stores.

Obsolete and Surplus Management

6.25 Items which are no longer usable at site are classified as obsolete. Obsolescence can occur due to various reasons such as, discontinuance of use of the original equipment, change in the manufacturing process, de bottlenecking exercises carried out at site, etc. Surplus is referred to spares whose inventory is far in excess of the normal consumption. Obsolete and surplus inventory should be identified and system visibility across the organization to block further procurement action.

6.26 The following areas need to be reviewed during internal audit:

- (i) Review the process of identification of an item as obsolete/ surplus.
- (ii) Review the process of approval for classification of an item as obsolete/ surplus.
- (iii) Review the process of stopping procurement action for such items.
- (iv) Review the process in place blocking further procurement of such items.
- (v) Review the process followed for disposal of such items.

Fixation of MRP Levels

6.27 Inventory of engineering spares is controlled through Scientific Inventory modeling techniques whereby, based on the consumption, lead time, criticality, etc (referred to as MRP Parameters), appropriate inventory levels are fixed for each item. Hence, it is critical that MRP Parameters be correctly maintained in the system as the Inventory level fixation is based on that.

The following areas need to be validated during internal audit:

- (i) Review the process followed for setting of MRP levels for various items of inventory.
- (ii) Review the periodic review of MRP levels.
- (iii) Review the process followed for determining the correct inventory levels as per MRP parameters maintained.
- (iv) Review the process of initiating procurement action where current inventory is lower than the inventory fixed as per MRP Parameters.
- (v) Review spares item not covered under MRP.
- (vi) Review spares item where the MRP data is inadequate.
- (vii) Validate the MRP parameters maintained in the system vis-à-vis actual on a test check basis.

Chapter 7

Internal Audit – Production Process

7.1 A petrochemical complex comprises of a main plant (referred to as the Mother Plant) and downstream plants which uses the products manufactured by the “mother plant” as raw materials for manufacture of end product. Both mother plant as well as the downstream plants generate by products during the course of manufacture of the main products. There are other utility plants such as, Captive Power Plant, De Mineralized Water Plant, Steam Plant, etc, supporting the main plants. Each grade of product manufactured (excluding utilities) uses a set of standard ingredients (raw materials, chemicals and catalyst) in a definite proportion. This is referred to as a recipe for the product.

7.2 The internal audit scope under each aspect of the production process is summarized as under:

(i) Monitoring Feedstock Inputs

Review the process on monitoring the input feeds as well as the outputs on a real time basis.

(ii) Maintenance of Plants And Identification of Root Causes of Breakdowns

Review the adequacy of plant maintenance systems in place, both preventive as well as need based. (Covered in details under plant maintenance)

(iii) Recording of Planned (Budgeted) Production And Standard Quantities of Inputs

Monthly production plan for each grade of a product is captured through a unique Process Order. This includes the standard quantity of inputs of Raw Materials/ Chemicals and Catalysts. At the end of each month the Process Order is closed and the actual productions as well as inputs consumed are recorded against the Process Order. The following should be reviewed during the audit:

- (a) Review the process of creation of monthly process orders. Report on process orders open for a period exceeding one month.

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- (b) Review the process of recording input quantities in the process order. Validate on a test check basis with the recipe.
 - (c) Review the controls in place for preventing
 - (i) The booking of inputs not included in a recipe against a particular grade
 - (ii) Non booking of inputs included in the recipe against a particular grade
 - (d) Review the process of authorization and release of process orders.
- (iv) Recording the Actual Production and Inputs**
- (a) Review the process followed for allocating inputs consumed among different grades.
 - (b) Review the system of carrying out a physical verification of shop floor inventory prior to booking of consumption.
 - (c) Review the MIS system and other data maintained for monitoring Raw Material Consumption.
 - (d) Validate the raw material consumption accounted in books with the quantity recorded in the Distributed Control Systems (DCS) on a test check basis.
 - (e) Review of the system in place for reconciliation of the quantity differences and accounting thereof.
- (v) Analysis of Variances**
- Review the process of analysis of variance between budgeted and actual production and standard vs. actual consumption.
- (vi) Process Followed for Booking of Utilities and Other Costs Against Each Grade**
- (a) Review the defined standards of utility consumption by each user plant.
 - (b) Review the process of recording the production of utilities by the respective plant.
 - (c) Review the process of recording the consumption of utilities by each consuming plant.

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- (d) Review the process of reconciliation of utility consumption and allocation among different plants. Report abnormal differences.
- (e) Review the actual consumption of inputs for manufacturing utilities with pre defined standards.

(vii) Raw Material/ Intermediate Product Balancing at Complex Level

In a petrochemical complex, output of one plant is used as a raw material for other plant(s). Hence, there is a continuous movement of material both intra complex as well as outside. Reconciliation of raw materials and intermediates (bulk materials) at complex level is critical and has to be done on a daily basis to ensure timely identification/ reconciliation of quantity differences.

The following controls need to be validated:

- (a) Process of dispatch-receipt confirmation.
- (b) Independent validation of accounted quantities with meter readings.
- (c) Documentation maintained by both sending as well as receiving plants.
- (d) System in place for addressing discrepancies.
- (e) Cross tallying of despatch quantities from the upstream plant with the final production reported by the downstream plants on a test check basis.

(viii) Accounting for the Production of By-products

The following aspects need to be validated:

- (a) Identification of by-products generated by each plant.
- (b) Review of process for accounting of the generation of by-product.
- (c) Review the physical storage of the by-product. It should be stored separately from the main product.
- (d) Physical verification of by products on a test check basis.

(ix) Validation of Overall Quantity of By-products Generated with Reference to the Production of the Main Product

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- (x) Access Controls over Recipe and Other Critical Data**
 - (a) Review the list of persons who are able to create/ change/ view the recipe. Report cases of incompatible rights.
 - (b) Review the linkage between the recipe and the Process Order. There should be a system block, preventing inclusion of items which are not in the recipe in the Process Order.
 - (c) Review the system of authorization of amendments to the recipe and the Process Order.

Chapter 8

Internal Audit – Contracts

8.1 The two basic types of contracts are as follows:

(a) One time Contracts (OTC)

In this case, the scope of work is identified in advance. The details of the job as well as the timelines thereof are specified in the Service Work Order and the contractor has to execute the job as per work order terms, e.g., replacement of a pipeline, maintenance of a section of building, etc

(b) Annual Rate Contracts (ARC)

As per this format, rates for services which are recurring in nature are determined in advance (generally, for a period ranging from one to two years). The contractor has to execute the jobs on an “As and when required” basis. E.g., Routine mechanical/ electrical jobs at plant, canteen contracts, etc.

8.2 Usually, a combination of OTCs as well as ARCs is used for managing the outsourced activities. In a large industry, a dedicated team is deployed for managing all contract related activity. This team comprises of a combination of commercial and technical experts.

The major activities included in Contract Management are:

- (a) Identification of activities to be outsourced
- (b) Identification of vendors
- (c) Evaluation of offers received from contractors
- (d) Finalization of contracts
- (e) Contract execution.

8.3 The major aspects to be audited under each activity of Contract management are as under:

(i) Outsourced Activities

Generally, recurring services of a non critical nature and services falling outside the organization’s core competence are outsourced to outside vendors. For outsourced services, an Annual Rate Contract (ARC) is entered into with the contractor, whereby the rates for each item of service are

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determined in advance and are valid for a period of one/ two years. The services are provided on an “As and when required basis”.

One Time Contracts (OTC) are awarded for activities similar in nature to a Project. Hence, OTCs are awarded for activities of a non-recurring nature such as overhauling of major equipments, repairs to a buildings, etc. In case of OTCs, service is, generally, requisitioned through a “Service Purchase Requisition”. In order to track the history of services as well as for cost comparison/ internal costing purpose it is essential that each item of service be uniquely identified. This identification is referred to as a service code

The following areas need to be reviewed in internal audit:

- (a) Process for identification of activities to be outsourced both under ARC as well as under OTC.
- (b) Process of codification of services.
- (c) Approval for requisitioning of services.
- (d) Completeness and accuracy of service requisitions.
- (e) Review of One Time Contracts executed in past one year to identify frequently used services for possible inclusion under Annual Rate Contracts.

(ii) Vendor Identification

Based on the services proposed for outsourcing, vendors who are capable of executing the services are identified. Based on factors such as competency/ resources available/ past experience in similar jobs, etc, they are generally grouped into various categories such as, A, B and C.

The following aspects need to be reviewed:

- (a) The process of identification of vendor.
- (b) The process of categorization of vendor.
- (c) The process of codification of new vendors.
- (d) The process of blocking inclusion of black listed/ debarred vendors.
- (e) Process of updating of vendor categorization based on results of performance evaluation.

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(iii) Contractor Evaluation

The following aspects need to be checked during internal audit of this area:

- (a) Process of opening of offers received from various vendors.
- (b) Process of confirming that all vendors have understood the scope of work correctly.
- (c) Process of matching the offers received with the rates paid for the same work previously. Internal auditor needs to validate whether such a job history database is in place.
- (d) The system of carrying out internal costing for the jobs for validation of offers.
- (e) The process of rate comparison of all offers before finalization of most competitive vendor.
- (f) The process of carrying out negotiations with vendors for achieving a reduction in rates.
- (g) Final selection of vendor.

(iv) Contract Negotiation and Finalization

The following aspects need to be reviewed during internal audit of this area:

- (a) Process for validating inclusion of all contracted terms in the Work Order.
- (b) Clear cut definition of activities in contractors as well as in company scope.
- (c) Process of automatic inclusion of standard terms and conditions in the Work Orders.
- (d) Process of optimization of various tax liabilities at the time of contract finalization.
- (e) Process in place for post facto regularization of contracts awarded on an emergency basis.

(v) Contract Execution

The following aspects need to be examined during audit of this contract execution:

- (a) The process of certification of services rendered by the Engineer in Charge. Internal auditors need to carry out physical evaluation on a test check basis by visit to the location.

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- (b) The process of periodic validation of quality of contractor used material as per contract terms
- (c) The process of maintenance of base data for certification by the concerned engineers.
- (d) Completion of jobs by contractors within stipulated timelines. In case of delays penalties need to be imposed.
- (e) The process of monitoring submission of Performance Bank Guarantees by contractors.
- (f) Process of accounting/ reconciliation of company owned materials and other resources provided to contractors, and making appropriate deductions from bills for excess consumption/ un accounted material.
- (g) In case of completion of a contract, process of validating recoveries of all amounts due from contractors before de mobilization.
- (h) The process of accounting for the amount payable for services in the books of account.
- (i) The system in place for periodic performance evaluation of contractors and appropriate categorization.
- (j) The process of debarring/ black listing of contractors.
- (k) The process for monitoring movement of contractor's material in/ out of the complex.

Chapter 9

Internal Audit – Plant Maintenance

9.1 Petrochemicals manufacturing plants are Continuous Process Plants, i.e., these plants operate on a 24X7 basis. Breakdown/ malfunctioning of equipment have a direct impact on the production process. Hence, it is imperative that proper systems and processes be in place identification/ execution/ monitoring of scheduled maintenance activity as well as addressing unforeseen issues such as, breakdowns on a real time basis.

9.2 Plant maintenance encompasses the following activities:

- (i) Equipment Codification
- (ii) Maintenance of Equipment Bill of material
- (iii) Identification of a maintenance job
- (iv) Validation and authorization thereof
- (v) Initiation of action for mobilization of resources required for the maintenance job
- (vi) Scheduling of a job
- (vii) Execution
- (viii) Close Out and Reporting.

Equipment Codification

9.3 Petrochemicals manufacturing complex comprises of a mother plant and a set of downstream plants. Both the mother plant and the downstream plant are stand alone manufacturing units. In view of the above, there is a huge number of equipments in operations at a complex. Each of the equipments needs to be properly tracked to capture details such as make/ model no/ supplier/ date of installation/ periodic maintenance schedules/ maintenance history, etc. Hence, a unique identifier which is referred to as an "Equipment Code". Accordingly, the following areas should be reviewed during the internal audit of Equipment Codification:

- (i) The process of maintenance of equipment codes.
- (ii) The process for monitoring the completeness of the equipment database such as, make, model no, date of manufacture, etc.

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- (iii) The system in place for ensuring that all equipments are properly codified. Report on equipments, which have not been codified.
- (iv) The process of maintenance of equipment history and maintenance data.

Maintenance of Equipment Bill of Material (BOM)

9.4 Bill of Material refers to a list of spares attached to a particular piece of equipment. It is essential that Bill of Material be updated for all equipments at a complex in order to have a complete database of spares required in a complex together with the consumption history thereof. Spares are generally categorized as under:

- (a) Engineering Spares-spares which form part of equipment.
- (b) Consumables-regularly consumed items such as lubricants, etc. Generally, consumables do not form part of Equipment Bill of Material.

The following areas should be examined during the internal audit of the Equipment BOM:

- (i) The process for updation of equipment BOM.
- (ii) Process of periodic review of equipment BOM's to ensure completeness. Report on equipment which are without BOM.
- (iii) Review the process of categorization of spares inventory into engineering spares and consumables.
- (iv) Validate that all engineering spares are linked to equipment BOMs. Report on spares lying in inventory not forming part of Equipment BOMs.
- (v) Review the system of blocking the drawl of spares against equipment unless it forms part of Equipment BOM.

Identification of Maintenance Job

9.5 Generally, the maintenance requirement is identified by the process or maintenance engineers who are in the field. The maintenance requirement is generally, logged in the system and put up to the shift in charge for validation. The following areas should be reviewed during the internal audit of logging the maintenance requirement:

- (a) The process for logging a maintenance requirement. Robust system should be in place to facilitate the capture of all maintenance requests from the field engineers.

Validation and Authorization of Maintenance Job

9.6 The maintenance requests logged in by the field engineers is validated and authorized for execution by the shift in charge.

The following areas should be reviewed during the audit:

- (a) Whether appropriate visibility of all maintenance requirements identified during a shift has been provided to the shift in charge.
- (b) Whether maintenance requests have been approved after appropriate scrutiny. Duplication in approvals of same maintenance request needs to be avoided.
- (c) Timeliness in approval of maintenance requests.

Resource Mobilization

9.7 Once a maintenance job is authorized for execution, necessary action has to be initiated for mobilization of resources such as materials, external services, skilled labour, etc for the job. It is desirable that the materials/ services/ labour, etc be requisitioned with reference to a particular equipment code for enabling proper maintenance of equipment history data.

The following areas need to be examined during audit:

- (i) The process of requisitioning resources for a particular job.
- (ii) The timeliness in mobilization of resources at site.
- (iii) The system checks in place blocking the procurement of unwanted resources, e.g., procurement of Engineering Spares not part of equipment BOM should be blocked.
- (iv) Number of jobs pending due to non-availability of resources.
- (v) MIS for jobs pending due to non-availability of resources.

Scheduling of Job

9.8 Once the resources are mobilized, jobs have to be scheduled for execution. The execution dates depends on the nature and criticality of the job. Emergency/ critical jobs having a direct impact on production are scheduled for immediate execution. In other cases, jobs are executed as per availability of resources, pendency of other jobs, etc.

The following areas need to be reviewed during internal audit:

- (i) Process followed for prioritization of jobs based on criticality.

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- (ii) The process followed for scheduling of jobs.
- (iii) Execution of jobs on the scheduled dates.
- (iv) The proportion of jobs not executed on scheduled dates.
- (v) MIS for pending jobs.

Job Execution

9.9 Due to hazardous nature of operations of the Petrochemical Industry, jobs are executed only after issue of safety permits by the operations engineer. A permit is issued only after validation that safety standards applicable to the particular job shall be adhered to.

The following areas need to be examined during internal audit:

- (i) System of Issue of Safety permits before commencement of the job.
- (ii) The process of surrender of permit after completion of the job.
- (iii) The process of extension/ renewal of permit.
- (iv) The process of de-mobilization from site after completion of the job.

Job Close Out and Reporting

9.10 After execution, the job needs to be closed in the pending jobs database. In addition following activities need to be carried out:

- (i) Certification of Services rendered by external agencies.
- (ii) Return of materials remaining after completion of the job.
- (iii) Final closure of the job in the pending jobs database.

The following areas need to be reviewed during internal audit:

- (a) Process followed for certification of services rendered by external agencies
- (b) Process of monitoring return of unused materials to stores
- (c) Process of final closure of jobs
- (d) Process of short closure of commitments (orders) which are pending even after job completion.
- (e) Reporting on Jobs executed but not closed out in the database.

Chapter 10

Internal Audit – Shutdown Management

10.1 Petrochemical manufacturing plants are continuous process plants. Manufacturing process is based on various chemical reactions which takes place inside a reactor (closed vessels columns). Unlike other industries, having batch processing, in a running continues process plant there is a very limited scope for carrying out maintenance activity without interrupting the process. On account of these factors the normal practice followed in the industry is to shut down a plant completely for a limited period of time for carrying out maintenance activities. Such a closure is, generally, referred to as a “planned shutdown”.

The activities carried out in a planned shutdown include:

- (i) Time based maintenance of moving equipment (technically referred to as rotating equipments).
- (ii) Inspection and maintenance of tanks/ columns/ vessels particularly from the inside.
- (iii) Minor Capex Jobs.
- (iv) Repair jobs identified during operation of the plant, which have been postponed till the shutdown.
- (v) Statutory inspection jobs.
- (vi) Jobs identified during the shutdown after inspection of equipment.

10.2 Following are the critical parameters for determining the successful execution of a shutdown:

- (i) Timeliness in completion
- (ii) Completion of all planned jobs
- (iii) Successful re-start of the plant post shutdown completion

Shutdown management comprises of the following set of activities:

- (i) Shutdown planning
- (ii) Shutdown execution and monitoring
- (iii) Shutdown closure and reporting

Shutdown Planning

10.3 Since every shutdown has production related implications, both for the plant proposed for shutdown as well as for other plants within the complex, the shutdown dates are finalized jointly by the production as well as marketing groups. Once the dates are frozen, the activities to be carried out as well as the proposed timelines thereof are finalized by the production and the maintenance teams. Based on the shutdown plan procurement action is initiated for materials and services. Proper synchronization of activities among various groups is critical to ensure adequate and timely availability of resources, both from within the organization as well as from external agencies to support activities planned during the shutdown.

10.4 The following areas should be reviewed during the internal audit of shutdown activities:

- (i) The process of fixation of shutdown dates.
- (ii) The process (including timeliness) of listing down all the activities to be carried out in the proposed shutdown. There should be a proper MIS in place which would enable identification/ inclusion of jobs to be carried out in a shutdown, apart from time based/ counter based maintenance. E.g., overhaul of an equipment giving problems during operations.
- (iii) The process (including timeliness) of fixation of the time schedule for completion of individual activities as well for completion of the shutdown project. Generally, modeling techniques such as PERT/ CPM as well as software such as MS Projects are used for planning.
- (iv) The process (including timeliness) of identification of persons responsible for completion of individual activities as well as for the completion of the shutdown.
- (v) The process (including timeliness) of identification of resources materials/ manpower with skill sets required for the shutdown.
- (vi) Fixation of the safe working norms to be adhered to during the shutdown.
- (vii) Finalization of the budgeted costs of the shutdown.
- (viii) Timeliness in the initiation of action for procurement of material as well as for finalization of shutdown contracts. Report on procurement/ contracts which were finalized on a single vendor/ emergency basis on account of delays in initiating procurement action.

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- (ix) Timely availment of various statutory permissions (if any) for the shutdown.
- (x) In case of rescheduling of shutdown, validate that proper authorizations have been obtained. The losses incurred due to rescheduling should be factored in the decision.

In all of the above areas, timeliness is critical hence delay in initiating action should be reported.

Shutdown Execution

10.5 The following areas need to be reviewed by the internal auditor:

- (i) Timeliness in mobilization of resources required for the shutdown both in house as well as external.
- (ii) Completion of all planned activities as per the schedule.
- (iii) Availability of all required resources at site prior to commencement of shutdown. Report on cases of non-completion/ delay in completion of scheduled activities due to non-availability of resources.
- (iv) Process of monitoring the progress of the shutdown on a real time basis.
- (v) Whether adequate contingency planning was in place to cover unplanned activities identified during shutdown. E.g., additional repair jobs identified after opening up of equipment.
- (vi) Whether extensions in shutdown time were authorized after detailed analysis of reasons.
- (vii) Adherence to stated safety norms during the shutdowns. Report on major safety related issues.

Shutdown Closure and Reporting

10.6 The following aspects need to be reviewed and validated during internal audit:

- (i) Review of shutdown report to validate:
 - (a) Completion of all planned activities as per scheduled timeliness.
 - (b) The unplanned activities carried out during the shutdown.
 - (c) Non completion/ delays in execution of planned activities with detailed reasons thereof.

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- (d) The total cost of the shutdown vis a vis budget with detailed justification of exceptions.
- (ii) Timely certification of all activities carried out during the shutdown.
- (iii) Timely return of all unused materials to stores.
- (iv) Timely de-mobilization of externally sourced resources from site.
- (v) Review of plant performance post shutdown to ensure that stated performance parameters have been achieved.

Chapter 11

Internal Audit – Sales and Distribution

Identification of Risk

11.1 The following factors are important for identification of risk:

- (i) Review the process of identifying the industry specific risk by the process owners.
- (ii) Report on adequacy of the steps taken to mitigate the risk.
- (iii) Review the variance analysis reported by the respective marketing department.
- (iv) Review and report on justification for variations.

Customer Master Management

11.2 The following are important factors with regards to customer management:

- (i) The process of creation of customer master & grouping as per the policy of the company.
- (ii) The criteria for groupings are followed and maintained in partner functions of enterprise ERP.
- (iii) The process for additions and deletions made to the group and identifying all cases where any addition/ deletion are not done as per the policy.
- (iv) The system for maintenance of records/ information with respect to group formation, and addition/ deletion therein.

Sales Management - Direct, Through Dealer and Consignment Agent

Pricing

11.3 The following are important factors with regards to pricing, payment terms and delivery orders release:

- (i) Check whether the Delivery Orders processed before price changes

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are invoiced as per the prevailing price (compare DO date, date of price change and invoice date)

- (ii) The price charged in the invoice with reference to pricing circulars/ pricing master in ERP.
- (iii) Whether the payment terms, Inco terms^{2*}, sales tax rates are correctly selected at the time of processing of order. Verify approvals for credit extended beyond agreed credit period (validation of customer master).
- (iv) The basis/ criteria for clearing of financial block, sales tax block while processing of order. Verify the approvals in case of deviations.
- (v) Delivery orders pending for dispatch for more than five days.
- (vi) The pricing master maintained in ERP with the pricing circular and timely updation and authorization in system.
- (vii) The criteria/ basis for prioritizing delivery orders for dispatch.
- (viii) Invoice checking w.r.t. norms such as, basic price, sales tax rate, etc.

Invoicing

11.4 Internal auditor should take following important aspects into accounts:

- (i) The process for charging excise duty and sales tax in the invoice.
- (ii) Cases where dispatch date is different than the invoice date.
- (iii) Cases where the price charged is different than the prices mentioned in do.
- (iv) The upfront discount given to the customer with the pricing circular and approval.
- (v) Process followed for monitoring of performance by customer where upfront discount is given.
- (vi) Whether all invoices are generated only through ERP system. Verify and report on any offline invoices prepared.

*Inco Terms – International Commercial Terms are a series of pre-defined commercial terms published by the International Chamber of Commerce (ICC) that are widely used in International commercial transactions or procurement processes. A series of three-letter trade terms related to common contractual sales practices, the Inco terms rules are intended primarily to clearly communicate the tasks, costs, and risks associated with the transportation and delivery of goods like FOB(Free On Board), CIF(Cost, Insurance, Freight), etc.

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- (vii) Verify the adequacy of approvals from competent authority for issue of samples.
- (viii) The basis on which freight are charged in invoice to the customer in case of dispatches from plant. Check whether freight master in ERP is updated in timely manner.

DCA/ Agent Operation

11.5 The following are some important aspects related to DCA/ Agent operation:

- (i) Approval from competent authority is obtained for final settlement. Verify the documentation maintained for closure activities.
- (ii) The process of finalizing total dues to/ from agent/ DCA.
- (iii) Whether NOC obtained from all the customers is linked to the agent/ DCA whose services are discontinued.
- (iv) The receipt of indemnity bond from the discontinued agent/ DCA as per the policy of the company and as per the format prescribed.
- (v) Calculation of interest on security deposits from DCA at year end and TDS there on.
- (vi) Process followed for document collection, w.r.t., full and final settlement of DCA/ agent.

Credit Notes

11.6 The following are important aspects related to credit notes:

- (i) Whether the credit note proposals are approved by the competent authority.
- (ii) Whether appropriate transfers against credit notes for discounts and claims on sales made through agents are made to the account of agents.
- (iii) Whether credit notes issued to customers/ agents are adjusted towards overdue outstanding/ overdue interest/ any short payment only after approval of competent authority.
- (iv) Credit notes created manually/ through upload. Analyze the reasons for manual creation of credit notes and suggest on automation of issuance of such credit notes.

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- (v) Verify on test check basis detailed working and accounting of credit notes.
- (vi) Whether all the credit notes are sent within reasonable period.
- (vii) The process for creation/ updation and revision in rebate types. Verify that the rebate types are maintained as per the approved pricing circular/ approval from Pricing Committee.
- (viii) Whether changes/ amendments in the pricing/ discounts/ incentives policy are approved by appropriate authority and updated into the ERP system in timely manner.
- (ix) Whether timely updation in the system is done for changes in the grades or introduction of new grades.
- (x) The credit notes issued against complaints with approvals from the competent authority. Check the calculations of credit note as per approval.

Debit Notes

11.7 The following are important aspects with regards to debit notes:

- (i) Adherence to company policies for raising debit notes. Verify approvals for any deviations.
- (ii) Whether debit notes have been raised for overdue interest, delayed payment charges, trade/ cash discount reversals, cheque bounces, ET failure, rate differential recovery, etc.
- (iii) Reversal of special discounts and other discount.
- (iv) Whether the debit notes raised are sent to the customers before 15th of the following month.
- (v) The process of monitoring timely recovery of debit notes raised.
- (vi) Delays in appropriation of invoices and analyze the reasons for the same.
- (vii) Debit notes created manually/ through upload. Analyze the reasons for manual creation of debit notes and suggest on automation of issuance of such debit notes.
- (viii) Check calculation of debit notes on test basis and its accounting.
- (ix) Process for creation/ updation and revision in rebate types. Verify that the rebate types are maintained as per the approved pricing circular/ approval from Pricing Committee.

Taxation

11.8 The following are important aspects related to sales tax, excise and service tax:

(a) Sales Tax

- (i) Status of assessments completed for state sales and consignment agents sales under the jurisdiction of regional office.
- (ii) Whether sales tax collected from the customers are deposited on time.
- (iii) System for maintaining status of forms yet to be received, check forms available.
- (iv) The sales made at concessional rates without obtaining the forms.
- (v) Whether security cheques obtained in lieu of C forms are deposited into the bank for an amount equal to sales tax liability in case of non-receipt of C forms.
- (vi) State wise depot sales tax/ vat assessment status of/ DCAs.
- (vii) Sales tax payable and paid by Consignment Agent.
- (viii) Process of receipt of border forms for interstate stock transfer of material.

(b) Excise and Service Tax

- (i) Returns filed with excise authorities.
- (ii) Show-cause notices and compliance thereof.
- (iii) Whether credit on service tax on commission to agent has been availed. Report on cases of non-availment of service tax credit with ageing.
- (iv) Monthly provisions for discounts/ excise duty and stock reconciliation.

Sales Return

11.9 The following are important aspects related to sales return:

- (i) Process for passing credit notes towards returned material.
- (ii) Process for diversion sale.
- (iii) Credit notes/ replacements passed towards returned material.
- (iv) Process for receipt and storage of returned material.

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- (v) Whether approval from competent authority is obtained for sales returns.
- (vi) Adherences of sales return policy with ref to product policy.
- (vii) The system for disposal of returned materials and report cases where any such material is lying for more than 30 days.
- (viii) Sales returns and reasons for the same.
- (ix) Time period within which return material to be accepted had not expired.
- (x) Whether approval from competent authority is obtained for sales returns.

General ledger

11.10 The following are important for general ledger scrutiny:

- (i) Scrutinise general ledger balances.
- (ii) Review open items in GL accounts.
- (iii) Verify booking of accounting entries in appropriate cost centre and profit centre.

Debtors, Credit Management and Account Receivables

11.11 Internal auditor should cover following points for debtors, credit management and account receivable:

(a) Credit and Debtor Management

- (i) Process for fixation and monitoring of credit limit.
- (ii) Limits of postdated cheques/ Letter of Credit/ bank guarantees, authorized/ extended to DCAs/ customers.
- (iii) Process for updation of credit limit on receipt of any security in form of bank guarantees/ letter of Credit.
- (iv) Process for changes in the credit limit and report all cases where changes have been carried out without appropriate approval.
- (v) Sticky debtors and legal cases.
- (vi) Overdue debtors

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- (vii) Whether security cheques received from customers/ agents are scrolled into ERP and are in safe custody.
- (viii) Validity of the security cheques and authority letter obtained from customers/ agents.
- (ix) Verify the system of scrolling of postdated cheque, its timely deposition and timely uploading of deposition/ collection with reference to due dates of the invoices.
- (x) Physically verify the Postdated cheques lying with the ERP records.
- (xi) Verify the system for scrolling of cheques, safe custody and timely deposit into bank.
- (xii) Verify process for determination of due dates for payment of invoices, process for monitoring non-payment of invoices on due dates and verify whether debit notes are raised for delays in payment.
- (xiii) Verify process for segregation of cheques into high value and low value and report cases where high value cheques are deposited under low value clearing.
- (xiv) Verify process for recording and accounting of dishonoured cheques.
- (xv) Check that payees name is written on all instruments.
- (xvi) Collection of instruments is kept in safe custody.
- (xvii) Bank guarantees scrolling, scanning, authorized/ extended to DCAs/ customers.
- (xviii) Verify that penalty is levied as per policy.
- (xix) Whether any credit limit enhancement proposal is generated and action taken to address the same.
- (xx) Verify timely credit as per the FCS wise norms v/ s actual receipt.
- (xxi) Verify timely collections against dues from DCAs/ customers, and it's timely appropriation into customer's account.
- (xxii) Check the calculation of CMS charges/ collection charges paid to the banks.
- (xxiii) Verify process for collections through third party discounting.
- (xxiv) Verify process for creation of customer master.
- (xxv) Check whether duplicate customer exist under an agent.

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- (xxvi) Open line items in customer/ DCA/ consignment agent accounts and report on overdue entries lying for more than 30 days and any other debit open entries.
- (xxvii) Process for obtaining balance confirmations on monthly basis from consignment agents and DCAs.
- (xxviii) Process for maintaining of necessary records for transferring balances from one customer to other or from customer to DCAs.
- (xxix) Process for refund of old credit balances (more than a year) and report cases where proper approval has not been obtained.
- (xxx) Old unadjusted/ inappropriate balances in customer/ DCA/ consignment agent account.
- (xxxi) Open entries pertaining to debit notes raised and report cases where the debit notes are pending for realization/ adjustment for more than the 7th day of the month following the month of raising debit notes.

(b) Channel Financing

- (i) Verify system of scrolling of daily invoices for payments from channel banker and also instances and frequencies of e-payment failures.
- (ii) Verify invoices are scrolled for daily posting to banker and all corresponding credits have been obtained.
- (iii) Verify process for stoppage of supplies/ review of limits, of any customer in case of repeated returns.
- (iv) Whether Channel finance limit along with ERP limit is as per the prescribed norms and verify approvals for any exceptions.
- (v) Verify whether security cheques received from customers/ agents are scrolled into ERP and are in safe custody of the region.
- (vi) Validity of the security cheques and authority letter obtained from customers/ agents.

(c) Security

- (i) Verify the process for receipt and scrolling of bank guarantees from DCAs/ customers and report cases where scrolling is not done on the date of receipt.
- (ii) Verify whether bank guarantee are in the format prescribed.

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- (iii) Verify whether confirmations have been obtained from the issuing bankers in all cases for the bank guarantees.
- (iv) Physically verify bank guarantee received from customers with the ERP records.

Warehouse Management

11.12 The following are important aspects pertaining to internal audit:

- (i) Compliance of various statutory requirements, company guidelines by the depot/ warehouse.
- (ii) Conditions of stock stored and take physical verification in warehouses.
- (iii) Verify whether the RG-23D register is updated to reflect the position of stock of current date.
- (iv) Verify whether all physical movements of materials in warehouse are recorded.
- (v) Verify process for quantitative reconciliation/ RG 23D-modvat report with stock.
- (vi) Verify procedure of GRN preparations and report all cases where receipt details acknowledged in the receipted challan are different than the GRN details.
- (vii) Verify cases where shortages are booked other than through GRN. Check approval & recovery status on the same.
- (viii) Verify cases where receipt quantity/ quality are different than the invoiced quantity/ quality. Review the process of preparation of GRN in such cases. Report all cases where goods are lying as restricted stock for more than 15 days.
- (ix) Verify slow-moving/ non -moving items (if any).
- (x) Verify the stock in transit stock and report on materials that are in transit for more than 15 days.
- (xi) Verify system for disposal of returned materials and report cases where any such material is lying for more than 30 days.
- (xii) Verify system of preparation of invoices and exit entry and report major observations.
- (xiii) Verify status of pending claims and their resolution.

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- (xiv) Verify system of record keeping
- (xv) Verify cases where shortages are booked other than through GRN. Check approval and recovery status on the same and report on deviations.
- (xvi) Verify stock transfers between one warehouse to another warehouse affected during the period of audit coverage and scrutinize the implications, approvals, etc. Report major observations the scrutiny done.

Chapter 12

Internal Audit – Insurance

12.1 Insurance coverage of assets of a huge petrochemical plant is very critical in view of high risk involved in acceptance of the policy due to following factors:

- (i) Hazardous nature of the raw materials and product in the plant
- (ii) Criticality of the production involving high value with large potential fire hazard
- (iii) Connected third party claims due to surrounding risks and resultant consequential public liability as a result of happening of fire or other damages to the plant.

In view of the criticality and high value, the insurance premium is subject to many loading based on several parameters. However, if the Insurance Company is satisfied, after inspection of the plant, about the existence of favourable features, there will be reduction in premium outgo.

Factors Affecting Insurance Premium

12.2 The following process parameters are required to be identified for ascertaining the premium rate of the various blocks/ items/ tankages:

- (i) Separating distances
 - (a) Between plants/ process units.
 - (b) Between plant and tankage/ gas holders.
 - (c) Between plant and liquefied/ pressurized hydrocarbon/ substituted hydrocarbon/ hydrogen spheres or bullets.
 - (d) Between plant and utilities, auxiliaries, miscellaneous buildings and stocks in open.
 - (e) Between tankages/ gas holders and liquefied/ pressurized hydrocarbons/ substituted hydrocarbons/ Hydrogen spheres/ bullets.
 - (f) Between tankages/ gas holders and utilities, auxiliaries, miscellaneous buildings and stocks in open.

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- (g) Between liquefied/ pressurized hydrocarbon/ substituted hydrocarbon/ Hydrogen spheres/ bullets and utilities, auxiliaries, miscellaneous buildings and stocks in open.
- (h) Between two tanks/ gas holders.
- (ii) Type of unit operations/ process carried out such as, distillations, endothermic/ exothermic reactions, Alkylation, Halogenation, Oxidation, Nitration.
- (iii) Operating Conditions, such as, operating pressures, operating temperature.
- (iv) Hold-up of hydrocarbons, hydrogen and substituted hydrocarbons in the process equipment.
- (v) Details of storage tanks, i.e., type of tanks, contents.
- (vi) Loading warranties applicable to plants/ storages/ utilities for non compliance of fire protection infrastructures.
- (vii) Discount warranties applicable to plants, storages, and utilities for maintaining fire extinguishers equipment (FEA) installations.

Internal auditor should check whether all these measures have been taken to optimize the premium outgo for coverage of insurance since substantial reduction in premium are allowed for such favourable features.

Internal Audit Checklist

12.3 Internal auditor's procedures with respect to the various aspects of insurance would include following:

- (i) Verify adequacy of insurance coverage.
- (ii) Verify proper classification under insurance tariff and premium cost optimization.
- (iii) Verify all insurance policies are in force and valid.
- (iv) Verify that all claims are lodged and report on delays in lodgment of insurance claims and reason for the same.
- (v) Review system of timely alterations to sum insured on the basis of addition/ deletion to assets insured.
- (vi) Review system of receiving/ preserving documents necessary for filing of claims.
- (vii) Review system of follow up for settlement of claims with insurance companies.

Chapter 13

Internal Audit – Legal Compliance

13.1 The external environment is becoming much more demanding of strong corporate governance and good controls. Internal Audit has key role to play in providing independent assurance on the adequacy, appropriateness and effectiveness of internal controls and calibrates the chances of possible deviations; demonstrate transparency, accountability. This chapter provides a brief of current legislations applicable to petrochemical industry.

Statutory Regulations on Health, Safety and Environmental Protection

(i) Various Registers/ records which are required to be maintained to comply with Health, Safety and Environment are as follows:

Sr. No.	Name of the Register	Name of the Statute	Form No./ Rules
1.	A permanent register giving full details of all gas holders.	Maharashtra Factory Rules, 1963	Form 13A/ Rule 73(A)(9)
		Gujarat Factory Rules, 1963	Rule 61(A)(8)(ii)
		Orissa Factory Rules, 1950	Form 83/ Rule 56-A(8)(ii)
2.	A copy of examination of gas holder by a competent person to be kept in the register	Maharashtra Factory Rules, 1963	Form 13B/ Rule 73(A)(10)
		Gujarat Factory Rules, 1963	Form 11A Rule 61(A)(8)(iv)
	The results of examination of water sealed gasholder	Orissa Factory Rules, 1950	Rule 56-A(8)(iii)
		Uttar Pradesh Factory Rules, 1950	Not specified
		Punjab Factory Rules,	

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Sr. No.	Name of the Register	Name of the Statute	Form No./ Rules
		1952	
3.	A register giving particulars of examinations of hoists or lifts.	Maharashtra Factory Rules, 1963	Form 11/ Rule 62
		Gujarat Factory Rules, 1963	Form 9/ Rule 58
		Orissa Factory Rules, 1950	Form 7-A/ Rule 55(1)
		Uttar Pradesh Factory Rules, 1950	Rule 55(1)
		Punjab Factory Rules, 1952	Form 23/ Rule 60(1)
4.	A register giving particulars of examination of lifting machines, ropes and lifting tackles.	Maharashtra Factory Rules, 1963	Form 12/ Rule 64(2)
		Gujarat Factory Rules, 1963	Form 10/ Rule 60(2)
		Orissa Factory Rules, 1950	Rule 55-C
		Uttar Pradesh Factory Rules, 1950	Rule 55-A(3)
		Punjab Factory Rules, 1952	Rule 60(3)
5.	A register containing information for the weekly checks carried out confirming the effectiveness of the inter-lock; weekly checks confirming all accessories are in good state of repairs; four hourly records of fuel oil temperature, pressure, thermic fluid	Maharashtra Factory Rules, 1963	Rule 73-ZA(xvii)
		Gujarat Factory Rules, 1963	Rule 68-D(20)
		Orissa Factory Rules, 1950	No register and record is specified.
		Uttar Pradesh Factory Rules, 1950	
		Punjab Factory Rules, 1952	

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Sr. No.	Name of the Register	Name of the Statute	Form No./ Rules
	inlet/ outlet pressure and temperature, flue gas temperature.		
6.	Health register containing the details of medical examination	Maharashtra Factory Rules, 1963	Form 7/ Rule 18(7)
		Gujarat Factory Rules, 1963	Form 32/ Rule 68T(1)(c)
		Orissa Factory Rules, 1950	Form 31/ Rule 96
		Uttar Pradesh Factory Rules, 1950	Form 27/ Rule 63-I(1)(c)
		Punjab Factory Rules, 1952	Form 34/ Rule 67-P(1)(c)
7.	A record of certificate of fitness of person employed for first time.	Maharashtra Factory Rules, 1963	Form 6/ Rule 73-V(2)
		Gujarat Factory Rules, 1963	Form 33/ Rule 68-T(2)
		Orissa Factory Rules, 1950	Form 30/ Rule 96
		Uttar Pradesh Factory Rules, 1950	Form 26/ Rule 63-I(2)
		Punjab Factory Rules, 1952	Form 32/ Rule 67-P(2)
8.	Minutes of Safety committee meeting shall be recorded.	Maharashtra Factory Rules, 1963	Rule 73-J(5)
		Gujarat Factory Rules, 1963	Rule 68-F(5)
		Uttar Pradesh Factory Rules, 1950	Rule 62-B(5)
		Punjab Factory Rules, 1952	Rule 66-F(5)
9.	A register of all	Maharashtra Factory	Form 30/ Rule

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Sr. No.	Name of the Register	Name of the Statute	Form No./ Rules
	accidents and dangerous occurrence.	Rules, 1963	123(1)
		Gujarat Factory Rules, 1963	Form 29/ Rule 111(1)
		Orissa Factory Rules, 1950	Form 26/ Rule 105
		Uttar Pradesh Factory Rules, 1950	Form 23/ Rule 122
		Punjab Factory Rules, 1952	Form 26/ Rule 111
10.	Inspection Book containing remarks passed by the Inspector or Certifying Surgeon	Maharashtra Factory Rules, 1963	Form 31/ Rule 124
		Gujarat Factory Rules, 1963	Form 31/ Rule 112
		Orissa Factory Rules, 1950	Rule 106
		Uttar Pradesh Factory Rules, 1950	Rule 123(a)
		Punjab Factory Rules, 1952	Form 35/ Rule 112
11.	Records of lime washing relating to dates on which white-washing, colour-washing, varnishing, etc are carried out	Maharashtra Factory Rules, 1963	Form 8/ Rules 20 and 51
		Gujarat Factory Rules, 1963	Form 7/ Rules 17 & 48
		Orissa Factory Rules, 1950	Form 7/ Rules 16 & 47
		Uttar Pradesh Factory Rules, 1950	Form 8/ Rules 17(2) & 48
		Punjab Factory Rules, 1952	Form 7/ Rules 18 & 49
12.	The report of the result of examination of Pressure Plant and	Maharashtra Factory Rules, 1963	Form-13/ Rule 65(7)(b),
		Gujarat Factory Rules,	Form-11/ Rule

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Sr. No.	Name of the Register	Name of the Statute	Form No./ Rules
	vessels operated over atmospheric pressure shall be maintained.	1963	61(9)(b)
		Orissa Factory Rules, 1950	Form-8/ Rule 56(9)(b)
		Uttar Pradesh Factory Rules, 1950	Form-9/ Rule 56(9)(b)
		Punjab Factory Rules, 1952	Form-8/ Rule 61(7)
13.	A record in respect of monitoring of working environment in the factory.	Gujarat Factory Rules, 1963	Form-37/ Rule 12B
14.	The record of inspection and test shall be maintained for connections and contacts of the tank or receptacle required under rule 127 as inspected by a competent person by means of a direct reading instrument such as a Megar.	Petroleum Rules, 2002	Rule 128
15.	The record of testing of relief valves shall be maintained. The test certificate shall be issued in the prescribed proforma.	Petroleum Rules, 2002	Rule 18(2)(xiii)
16.	The Certificate of electrical installation issued by a competent person before engineering any electric circuit and	Petroleum Rules, 2002	Rule 114

Internal Audit – Legal Compliance

Sr. No.	Name of the Register	Name of the Statute	Form No./ Rules
	any electric apparatus in hazardous area for the first time and after each repair, maintenance and alteration work carried out in circuit or apparatus. The retention period of certificate is max 3 months.		
17.	One copy of the plan or plans for the licensed premises signed in token of approval by the Chief Controller or Controller shall be attached to the license, which shall form part of such license.	The Static and Mobile Pressures (unfired) Rules, 1981	Rule 51(2)
18.	The owner of a cylinder shall keep for the life of each cylinder, a record containing the following information regarding each cylinder, namely:- (i) Cylinder manufacturer's name and the rotation number; (ii) The specification number to which the cylinder	The Gas Cylinders Rules, 2004	Rule 27

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Sr. No.	Name of the Register	Name of the Statute	Form No./ Rules
	is manufactured; (iii) Date of original hydrostatic test or hydrostatic stretch test; (iv) Cylinder manufacturer's test and inspection certificates; (v) Number and date of letter of approval granted by the Chief Controller.		
19.	Hazardous chemicals covered under Schedule 1 may be imported subjected to certain conditions including that the:- Occupier to maintain records of imports of hazardous chemicals in the format as per schedule 10	Manufacture, storage and import of hazardous chemical rules 1989, amended in 2000	Rule 18(5)
20.	Maintain records related to the generation, collection, reception, storage, transportation, treatment, disposal and/ or handling of biomedical waste.	Bio-medical waste (Management and Handling) Rules, 1998	Rule 11
21.	Maintain records in Form 3 for generation, collection, reception, treatment, transport, storage and disposal	Hazardous Wastes(Management & Handling) Rules, 1989	Form 3/ Rule 9(1),

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Sr. No.	Name of the Register	Name of the Statute	Form No./ Rules
	of hazardous waste.		
22.	Maintain a record of such auctions.	Batteries (Management & Handling) Rules, 2001	Rule 11(iii)
23.	Record of tests of Fire extinguishes shall be maintained.	Indian Electricity Rules, 1956	Rule 43(1)
24.	A record of every earth test made and the result thereof shall be kept by the supplier for a period of not less than two years after the day of testing	Indian Electricity Rules, 1956	Rule 61(6)

(ii) The various returns/ documents/ payments to be made under various statutes to comply with the Health, Safety and Environment Regulations are:

Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
1.	Stability Certificate	Maharashtra Factory Rules, 1963 Gujarat Factory Rules, 1963	Form IA/ Rule3(A) Form IA/ Rule3(C)	Submit Stability certificate on construction, reconstruction of a factory and once every 5 years or after extension, alteration, repairs or addition or	Chief Factory Inspector.

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
				replacement of plants & machinery.	
		Orissa Factory Rules, 1950	Form I-A/ Rule 3-A	Submit Stability certificate on construction, reconstruction, extension or taken into use as a factory or part of a factory.	
		Uttar Pradesh Factory Rules, 1950	Form 2/ Rule 3(3)		
		Punjab Factory Rules, 1952	Form 1-B/ Rule 4	Submit Stability certificate on construction, reconstruction extension or any building taken into use as a factory or part of a factory and before addition & use of new plant & machinery.	
2.	Notice of occupation	Maharashtra Factory Rules, 1963	Form 2/ Sec 7(1) & Rule 14	15 days before any premises is	Chief Factory Inspector.

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
		Gujarat Factory Rules, 1963	Form 2/ Sec 7(1) & Rule 12	occupied or used as a factory.	
		Orissa Factory Rules, 1950	Form 2/ Sec 7(1) & Rule 12		
		Uttar Pradesh Factory Rules, 1950	Form 4-B/ Sec 7(1) & Rule 14-C		
		Punjab Factory Rules, 1952	Form 2/ Sec 7(1) & Rule 15		
3.	Notice of change of Manager	Maharashtra Factory Rules, 1963	Form 5/ Sec 7(4) & Rule 15	Within 7 days from the date on which the newly appointed manager takes over charge.	Chief Factory Inspector.
		Gujarat Factory Rules, 1963	Form 3A/ Sec 7(4) & Rule 12A		
		Orissa Factory Rules, 1950	Form 3/ Sec 7(4) & Rule 12-A		
		Uttar Pradesh Factory Rules, 1950	Form 4-A/ Sec 7(4) & Rule 14-D		
		Punjab Factory Rules, 1952	Form 2-A/ Sec 7(4) & Rule 15-		

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
			A		
4.	Notification of accidents	Maharashtra Factory Rules, 1963	Form 24/ Rule 115 (1) & (2)	Send written report confirming the notice within 12 hours of the taking place of accidents which cause death to any person or are of a serious nature that is likely to prove fatal.	Chief Factory Inspector, District Magistrate, OR Sub-divisional Magistrate, Officer-in-charge of nearest Police station, the relatives of the injured or deceased person
			Form 24/ Rule 115 (3)	Send written report confirming the notice within 24 hours after expiry of 48 hours immediately following the accident which cause such bodily injury as prevented or will probably	Chief Factory Inspector

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
				prevent the injured person from working.	
			Form 24-A/ Rule 115(1) & (2)	Send written report confirming the notice within 12 hours of the taking place of dangerous occurrence.	Chief Factory Inspector, District Magistrate, OR Sub-divisional Magistrate, Officer-in-charge of nearest Police station,
		Employees State Insurance (General) Regulations, 1950	Form 16/ Regulation 68	Within 12 hours of the taking place of accidents or dangerous occurrence.	Administrative Medical Officer
		Gujarat Factory Rules, 1963	Form 21/ Rule 103 (1), (2) & (3)	Send written report confirming the notice within 12 hours of the taking place of accidents which cause death to any person or	Chief Factory Inspector, District Magistrate, OR Sub-divisional officer, Officer-in-charge of nearest

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
				are of a serious nature that is likely to prove fatal.	Police station, the relatives of the injured or deceased person.
			Form 21/ Rule 103 (4)	Send written report confirming the notice within 24 hours after expiry of 48 hours immediately following the accident or dangerous occurrence which cause such bodily injury as prevented or will probably prevent the injured person from working.	Chief Factory Inspector
			Form 21-A/ Rule 103 (1), (2) & (3)	Send written report confirming the notice within 12 hours of the	Chief Factory Inspector, District Magistrate, OR Sub-

Internal Audit – Legal Compliance

Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
				taking place of dangerous occurrence.	divisional officer, Officer-in-charge of nearest Police station,
		Orissa Factory Rules, 1950	Form 18/ Rule 97(1) & (2)	Send written report confirming the notice within 12 hours of the taking place of an accident or dangerous occurrence causing death or bodily injury to any person as is likely to cause his death.	Chief Factory Inspector, District Magistrate, OR Sub-divisional Officer, Officer-in-charge of nearest Police station, the relatives of the injured or deceased person.
			Form 18/ Rule 97(1), (2) & (3)	Send written report confirming the notice within 24 hours after expiry of 48 hours immediately	Chief Factory Inspector

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
				following the accident or dangerous occurrence which cause such bodily injury as prevented or will probably prevent the injured person from working.	
			Form 18-A/ Rule 97(1) & (2)	Send written report confirming the notice within 12 hours of the taking place of dangerous occurrence which has not resulted in bodily injury to any person.	Chief Factory Inspector, District Magistrate, OR Sub-divisional Officer, Officer-in-charge of nearest Police station
		Uttar Pradesh Factory Rules, 1950	Form 18/ Rule 110 (1), (2) & (3)	Confirm notice within 12 hours of the taking place of an accident or dangerous occurrence	Chief Factory Inspector, District Magistrate, OR Sub-divisional Officer,

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
				causing death or bodily injury to any person as is likely to cause his death.	Officer-in-charge of nearest Police station, the relatives of the injured or deceased person.
			Form 18/ Rule 110 (1), (2) & (4)	Send written report confirming the notice within 24 hours after expiry of 48 hours immediately following the accident or dangerous occurrence which cause such bodily injury as prevented or will probably prevent the injured person from working	Chief Factory Inspector
			Form 18-A/ Rule 110(1) &	Confirm notice within 12 hours of	Chief Factory Inspector,

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
			(2)	the taking place of dangerous occurrence which has not resulted in bodily injury to any person.	District Magistrate, OR Sub-divisional Officer, Officer-in-charge of nearest Police station
		Punjab Factory Rules, 1952	Form 18/ Rule 103 (1), (2) & (3)	Confirm notice within 12 hours of the taking place of an accident or dangerous occurrence causing death or bodily injury to any person as is likely to cause his death.	Factory Inspector, Chief Factory Inspector, District Magistrate, OR Sub-divisional Magistrate, Officer-in-charge of nearest Police station,
			Form 18/ Rule 103 (4)	Send written report confirming the notice within 24 hours after expiry of 48 hours immediately	Factory Inspector and Chief Factory Inspector

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
				following the accident or dangerous occurrence which cause such bodily injury as prevented or will probably prevent the injured person from working.	
			Form 18-A/ Rule 103(1) & (3)	Confirm notice within 12 hours of the taking place of dangerous occurrence which has not resulted in bodily injury to any person.	Factory Inspector, Chief Factory Inspector, District Magistrate, OR Sub-divisional Officer, Officer-in-charge of nearest Police station
5.	Notification of fatal accident in connection with the generation, transmission	Indian Electricity Rules, 1956	Rule 44A	A telegraphic report within 24 hours of the knowledge of the occurrence	Electrical Inspector

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
	supply or use of Electrical energy			of the fatal accident and a written report in the form set out in Annexure XIII within 48 hours of the knowledge of occurrence of fatal and all other accidents.	
6.	Furnish a copy of entries in the Register of accidents and dangerous occurrences relating to the year immediately precedes the 1 st January	Maharashtra Factory Rules, 1963 Gujarat Factory Rules, 1963 Orissa Factory Rules, 1950 Utter Pradesh Factory Rules, 1950 Punjab Factory Rules, 1952	Form 30/ Rule 123(2) Form 29/ Rule 111(2)	Annually before 15th February.	Chief Factory Inspector
				Not specified	
7.	Notice of poisoning & disease	Maharashtra Factory Rules, 1963	Form 25/ Rule 116	Within 4 hours.	Administrative Medical Officer, Employees

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
					State Insurance Scheme, Bombay, Chief Inspector, Medical Inspector of Factories
		Gujarat Factory Rules, 1963	Form 22/ Rule 104	Immediately	Chief Inspector, Certifying surgeon
		Orissa Factory Rules, 1950	Form 19/ Rule 98		
		Utter Pradesh Factory Rules, 1950	Form 19/ Rule 112		
		Punjab Factory Rules, 1952	Form 19/ Rule 104		
8.	Report of accidental release or likely to be discharged of polluted water into a stream or well or sewer or on land.	Water (Prevention and Control of Pollution) Act, 1974	Sec 31(1)	Immediately	State Pollution Control Board & Chief Factory Inspector.
9.	Report of	Air	Sec 23	Immediately	State

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
	accidental release or likely to be released of any air pollutant into the atmosphere in excess of the standards laid down by SPCB	(Prevention and Control of Pollution) Act, 1981			Pollution Control Board & Chief Factory Inspector.
10.	A written report	Manufacture, storage and import of hazardous chemical rules, 1989	Schedule 7/ Rule 7(1)	3 months before undertaking any industrial activity.	State Pollution Control Board & Chief Factory Inspector.
		Gujarat Factory Rules, 1963	Schedule 7/ Rule 68-J(6)(1)		
11.	A Safety report	Manufacture, storage and import of hazardous chemical rules, 1989	Schedule 8/ Rule 10(1)	90 days before undertaking any industrial activity.	Chief Factory Inspector & State Pollution Control Board
		Gujarat Factory Rules, 1963	Schedule 8/ Rule 68-J(9)(1)	3 months before undertaking any industrial activity	

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
			Rule 68-J(10)(2)	Within 3 years of the date of the last such report and submit a copy of the same within 1 month.	
12.	A Safety Audit report	Manufacture, storage and import of hazardous chemical rules 1989,	Rule 10(4),10(5) & 10(6)	Once a year and report to be submitted within 30 days.	Chief Factory Inspector & State Pollution Control Board
13.	Updated Safety Audit Reports	Manufacture, storage and import of hazardous chemical rules 1989,	Rule 11(1)	90 days before making any modification in industrial activity	Chief Factory Inspector & State Pollution Control Board
14.	Mock drill of Onsite emergency plan	Manufacture, storage and import of hazardous chemical rules 1989,	Rule 13(4), & 13(5)	Every six months and send detailed report immediately.	Chief Factory Inspector & State Pollution Control Board
15.	Notification of major accident	Manufacture, storage and import of hazardous chemical	Schedule 6/ Rule 5	With 48 hours of taking place of an	Chief Factory Inspector & State Pollution

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
		rules 1989,		accident.	Control Board
		Gujarat Factory Rules, 1963	Schedule 6/ Rule 68-J(4)(1)	Forthwith intimate & report	Chief Factory Inspector & Factory Inspector
16.	Import of hazardous chemicals	Manufacture, storage and import of hazardous chemical rules 1989,	Rule 18(2)	Before 30 days or as reasonably possible but not exceeding the date of import	Chief Controller of Imports & Exports under Import & Export (Control) Act, 1974
17.	Annual Report	Bio-medical waste (Management and Handling) Rules, 1998	Form II/ Rule 10	By 31st January every year	State Pollution Control Board
18.	Test report of tanks	Petroleum Rules, 2002	Rule 126	Before being put into use after being installed and secured in the final position or after undergoing re-installation or any major repair	Chief Controller of Explosives.

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
19.	Certificate of safety issued by a competent person in the proforma	Petroleum Rules, 2002	Rule 130	Before any petroleum is stored in an installation or service station first time or whenever any additions or alterations to the enclosure walls and embankments are carried out or when a tank is installed or its position shifted.	Chief Controller of Explosives.
20.	No Objection certificate	Static and Mobile Pressures (unfired) Rules, 1981	Rule 46A	For a new license to store compressed gas in pressure vessels	Chief Controller of Explosives.
21.	Notice of accident	Gas Cylinders Rules, 2004	Rule 67	Confirm notice within twenty four hours by a letter giving particulars of the	Chief Controller of Explosives, District Magistrate, & Officer-

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
				occurrence	in-charge of nearest Police station.
22.	End-use certificates from the consumers and furnish customer-wise sales	Solvent, Raffinate and Slop (acquisition, Sale, Storage and Prevention of use in Automobiles) Order, 2000	Clause 3(3)	Quarterly basis	District Magistrate or to the State Civil Supplies Authorities
23.	End-use certificates	Solvent, Raffinate and Slop (acquisition, Sale, Storage and Prevention of use in Automobiles) Order, 2000	Clause 3(4)	Quarterly basis	District Magistrate or to the State Civil Supplies Authorities
24.	End-use certificates from the consumers and furnish customer-wise sales	Naptha (acquisition, Sale, Storage and Prevention of use in Automobiles) Order, 2000	Clause 3(iv)	Quarterly basis	District Magistrate or to the State Civil Supplies Authorities
25.	End-use certificates	Naptha (acquisition, Sale,	Clause 3(v)	Quarterly basis	District Magistrate or to the

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
		Storage and Prevention of use in Automobiles) Order, 2000			State Civil Supplies Authorities
26.	Annual Report	Bio-medical waste (Management and Handling) Rules, 1998	Form II/ Rule 10	By 31st January every year	State Pollution Control Board or Committee.
27.	Copy 1 (white) of Manifest	Hazardous Wastes (Management & Handling) Rules, 1989	Form 9/ Rule 7(4), 7(5),	Whenever hazardous waste is sent for disposal.	State Pollution Control Board or Committee.
28.	Additional Copy 1 (white) of Manifest	Hazardous Wastes (Management & Handling) Rules, 1989	Form 9/ Rule 7(4), 7(5)	In case hazardous waste is likely to be transported through any transit state.	Concerned State Pollution Control Board or Committee.
29.	Provide relevant information	Hazardous Wastes (Management & Handling) Rules, 1989	For 10/ Rule 7(7)	Whenever hazardous waste is sent for disposal.	The transporter
30.	Environmental Impact Assessment (EIA)	Hazardous Wastes (Management & Handling) Rules, 1989	Rule 8(3)	Whenever a site is identified for establishing the facility for	State Pollution Control Board or Committee.

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Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
				treatment, storage and disposal of hazardous waste	
31.	Annual returns of hazardous waste	Hazardous Wastes (Management & Handling) Rules, 1989	Form 4/ Rule 9(2)	by 31st January every year	State Pollution Control Board or Committee.
32.	Accident report	Hazardous Wastes (Management & Handling) Rules, 1989	Form 5/ Rule 10	Immediately	State Pollution Control Board or Committee.
33.	Annual returns of auction of Non-ferrous metal wastes/ Used oil/ Waste oil	Hazardous Wastes (Management & Handling) Rules, 1989	Form 13/ Rule20(5)	by 31st January every year	State Pollution Control Board or Committee.
34.	Environmental statement for the financial year ending 31st March	Environmental Protection Rules, 1986	Form V/ Rule14	On or before 30th September every year	State Pollution Control Board.
35.	Fact of occurrence of discharge of environment	Environmental Protection Rules, 1986	Rule12	Immediately	Officer in-charge-of emergency or disaster relief

Internal Audit – Legal Compliance

Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
	al pollutant in excess of the prescribed standards or apprehension of such occurrence				operation in a district or other region of a State or Union territory, Regional Officer of CPCB or SPCB, Chief Inspector of Factories.
36.	Half yearly returns of auctions of used batteries	Batteries (Management & Handling) Rules, 2001	Form IX/ Rule11(ii)	By 30 th June and 31 st December every year	State Pollution Control Board.
37.	Quantity of water consumed in the previous month.	Water (Prevention and Control of Pollution) Cess Rules, 1978	Form I/ Rule 4(1)	On or before 5th of every calendar month	Member Secretary of Central Pollution Control Boards/ State Pollution Control Board or Nominated member of State Pollution Control Committee.

Technical Guide on Internal Audit of Petrochemical Industry

Sr. No.	Nature of Return/ Compliance	Name Of The Statute	Form/ Rules	Time Limit	To be sent to
38.	Environment Audit	Gujarat High Court orders dtd. 20.12.96 & 13.3.97 and modified vide order dtd. 16.6.99	-	On or before 31 st January every year	Gujarat Pollution Control Board
39.	Payment of Cess	Water (Prevention and Control of Pollution) Cess Act, 1977	Sec 6(2)	Before the due date specified on the assessment order	State Pollution Control Board.
40.	Particulars regarding nucleonic gauges and analyzers	Radiation Protection Rules, 1971	Proforma - C	Furnish information in the first week of January and July every year	Head RSD, AERB.
41.	Forward test report of every high or extra-high voltage circuit or additions thereto, other than an Overhead line.	Indian Electricity Rules, 1956	Rule 63(2)	Before making an Application for approval.	Electrical Inspector