Coromandel

FUTURE POSITIVE

Coromandel Competency Manual

A Report By

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Compentency Management System

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1. Introduction to Competencies & Competency Dictionary

In this section we will try to understand what are competencies and why it is important to have, what is known as a competency dictionary. The word competency, for the purpose of this study shall mean a combination of knowledge, skill and attitude. Knowledge, is the data and information about a particular subject or area, which usually accrues to an individual through the formal process of learning. Skill, is the application of a knowledge and therefore the practiced ability that an individual develops. While the typical definition of a attitude is that pertaining to interpersonal skills, in this context, it however, refers to the proclivity of the person to process of learning and applying the same.

Over the period of years, competency definition has moved from KSA (knowledge, skill attitude) to ASK (attitude, skill and knowledge). The reason, is because, competency is continuum and one usually progress along

the same over a period of time. If the attitude, as defined above, is missing, then the other two elements either become irrelevant or insignificant. In an organization context, competencies are usually classified into managerial, behavioral, and functional.

The process of identifying the competencies be it functional, managerial & behavioral or leadership, is strategically driven, meaning that the basket of competencies that are identified are derived from organizational vision, objectives and strategies. While the functional competencies tend to be very specific to the industry or the organization, the managerial or behavioral competencies tend to be, common or similar (the extent of which, may though vary). Consequently, some of these competencies form a part of common management/organizational vocabulary, for e.g. communication. This however leads to a problem, that is, since it is a part of the general diction of the organization, there is a general perception that the definition, meaning and what constitutes it (i.e. the competency) are universally understood to be the same. Which however, is not usually the case. That is, continuing with our example of communication, for some it may mean (excellent) speaking, for some others it may mean ability to make presentation, and to still others ability to make good reports, etc. Though all of this does constitute communication, it is (a) not all of it, and (ii) it is not the same for everyone. In order to overcome this problem/issue, **a Competency Dictionary i**s prepared.

"A COMPETENCY DICTIONARY IS A ENTERPRISE/ORGANIZATION SPECIFIC DOCUMENT PREPARED IN CONSULTATION WITH ALL KEY CONSTITUENTS WHICH CLEARLY AND LUCIDLY DEFINES AND EXPLAINS, IN TERMS MEANING, & KEY INDICATORS THE VARIOUS MANAGERIAL /BEHAVIOURAL COMPETENCIES IDENTIFIED BY THE ORGANIZATION"

A competency dictionary is a document which helps those participating in an Development Centre process by establishing common definitions, it helps in ensuring that all the constituents have the same understanding of the competency, the key indicators for the same, the typical methods of improving it and finally (some of) the techniques for assessing the same. Also, this document aids in the development process, since the key indicators for each of the competencies are listed, thereby facilitating the process of drawing up the development road map.

A competency dictionary is not a static document. One, with changing strategies, new competencies get added to the basket. Two, also with changing conditions, new definitions of existing competencies may have to be drawn-up.

For the purpose of this competency development process we have defined our competencies in a four-level continuum

Level 1- Novice: This corresponds to someone who has the basic or rudimentary knowledge and can work without supervision

Level 2 – Practitioner: This corresponds to someone who has the working knowledge of the competency and can carry out without supervision (and at times can supervise others)

Level 3 – Developed: In this stage, someone has a good breadth and depth of understanding of the competency and can lead others in this area and can bring about improvements in technology/process

Level 4- Organizational Steward: This refers to someone who is an expert in the said area and is looked upto in the enterprise for guidance and support.

Each of these competency levels are unique, however, it is possible that there is a certain degree of overlap that may exists in defining each of the competencies across these levels.
A competency Dictionary therefore helps

1. In creating an enterprise wide standard definition of the competencies
2. In defining the competencies across various levels, helps in the process of profiling positions in terms of the competencies
3. Act as the base document for drawing up the learning and development of individuals, post the process of assessment
4. In creating the base document for knowledge management in the organization, and finally
5. Form the basis of a CBM- or a Competency Based Management process.

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2.1 Competency Development & Development Centers

Centers are initiatives taken up by organizations to identify and develop competencies of employees, to address the current and future capability needs of the enterprise. The design of development centers are typically organization specific, that is based on the need and requirements, culture and settings of the enterprise, organizations design their DCs. However, following are common steps that are typically used/followed

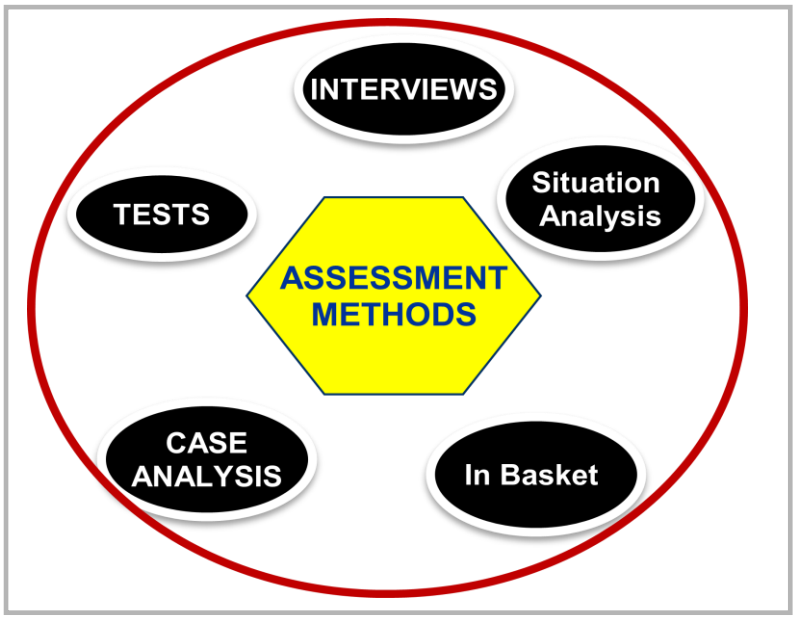
Competency Identification: Development Centers, as mentioned before, are based on competencies. The first step of the process in a DC is identification of the Competencies on which the development process shall be carried out. The competencies so identified are a combination of both the present as well as the future requirements of the organization and the positions for which the Development Center is being carried out.

Once the competencies are identified, the next step in the process is known as competency profiling. Simply stated, the process (of profiling) is to identify the level of requirement of each of the competencies identified, for a given position. A detailed description in the form of FAQs is given at the end of this document.

Development Center Design*:* The critical aspect of Development Center is the actual design of the various instruments and methods which shall be used for assessing each of the competencies. As shown in Fig. 2, depending on the competencies identified, the methods used in a DC can consist of any or combination of the following

Tests: Either standardized tests (typically used for behavioral parameters) or knowledge-based tests for functional competencies.

Power Interviews: This is a method in which an expert panel (from either the industry or function) is created and assigned to identify the strengths and development needs of individuals.



Case /Case let Analysis: Cases or caselets which focus on critical aspects of a competency are given to participants for analysis. These are then presented to a group of evaluators.

Situational Analysis: Situational analysis is an approach where in the participants are asked to analyze 'close to reality' situations – usually those that occur in the enterprise but which are represented in a different setting. This gives a perspective on how the participants would react to situations which may atypically occur in the organization.

In-Basket Analysis: This is a form of assessment in which participants are given a set of random items of works, which they may typically encounter in a day's work. The objective is to prioritize these and draw-up appropriate actions (decisions and other things) that need to be done, in the given period of time. This method helps in assessing a participant's capabilities in planning, prioritizing, decision making, analysis of information, and time management.

2.2 Reports & Recommendations: This is the last part of the development center, in which based on the findings of various assessment instruments used, a final report is prepared. Typically, a report would contain the following

- Summary of the assessment results
- Vectorized Values: Competency assessment – that is measuring the competency of an individual with reference to the position that he/she is occupying results in a scalar dimension – meaning that one would know the extent of the deficiency or otherwise of the competency but not know the extent of impact of the same, vis-à-vis the position. The process of determining this impact is known as vectorizing – which is assigning value to the competency strengths and gaps.
- Development Roadmapping: These could be ways in which the skills, knowledge are enhanced using variety of methods/approaches – including class room/Instructor lead learning, e-learning, project based learning, On Job Training, special projects, Job Rotation etc.

Benefits of a Development Center: There are several benefits that can accrue, to the organization and individual through a Development Center, some of which include

- The organization will be able to precisely targeted development activities (training, coaching, mentoring) focusing on areas identified in the Development Center as requiring growth improvement, thus increasing your return on investment in employee development.
- It could form an objective basis for comparing employees
- The experience enables participants to "up" their performance
- Based on the evaluation, acceptance and other internal parameters, organizations could use for other HR processes – from recruitment to career planning decisions.

3.0 Competency Based Management (CBM)

Though usually, Competency Mapping and Development are seen as processes required from a Learning and Development perspective, it has to be noted, that once a robust Competency Model is developed, it can be used for all aspects or elements of HR value chain. Just to elaborate, the CBM can be used for

1. Recruitment & Selection: Organization can streamline the recruitment and selection process by CBM through standardization of the advertisement process, pre-selection/selection interviewing and also preparing position specific induction process.
2. Performance Management Process: Most organizations use a combination of KRAs and Behavioral indicators or what are referred to as enablers in their performance evaluation methods. Organization can use its Competency Framework including the competency profiles for having objective PMS process

3. Reward and Recognition: CBM can be used for the purpose of identifying critical skills/competencies required for the organization and therefore draw up differential R&R mechanism for the same.
4. Career & Succession Planning: Growth paths for employees can be drawn up based on their individual competency profile or capability profile. Since in a CBM, all positions with an organization are mapped, movement of an individual across various positions can easily be visualized and appropriately actioned.
5. Leadership Pipeline: CBM is used for identification of HiPOTs or High Potential employees, which in turn can help in creating the Leadership Pipeline in the organization.

COMPETENCY DICTONARY

Boiler O & M

Description:

This competency may be defined as the combination of knowledge and skills required for carrying out the operation and maintenance of boiler the herbicides, insecticides, fungicides and other related products / key intermediaries

Level 1-Novice

- Is familiar with the basic working principles of Operation, Pressure rating, Temperature, Capacity, Quality & Quantity of Operating Medium & its characteristics, Types of Accessories of boilers
- Can identify critical components of Boiler and accessories, their operation, set points, scales, limits etc.
- Is familiar with different types of insulation and refractory materials
- Is aware of statutory requirements of Boiler operation under the Boiler act
- Is able to identify common spares and their requirements
- Is familiar with the characteristics of all the raw materials, intermediates and final products
- Is aware of the process involved in the manufacturing of various products / intermediaries
- Is aware of the operational features of all the mechanical and, electrical equipment instrumentation and control systems
- Is familiar with equipment layout and piping diagram related to various utilities
- Is aware of the basic maintenance practices such as preventive, routine, breakdown, annual turnaround plan etc. in terms of purpose and significance etc.
- Is aware of safe operations of all the equipment

Level 2-Practitioner

- Is conversant with operation of boiler and related facilities
- Can carry out routine, preventive, predictive and planned maintenance activities as per schedule
- Is able to identify the problems and take corrective actions & suggest preventive measures to avoid recurrence of the problem
- Is conversant with statutory compliance matters and related documentation
- Is aware the frequency of testing of Boiler & other accessories as per statutory norms
- Can maintain track records of boiler inspection
- Is able to monitor the availability of spares and take appropriate steps to reduce the stock-out
- Can initiate procurement of spares / consumables
- Is conversant with all types of safety permits necessary for initiating maintenance jobs
- Is able to review service-level agreements with key suppliers / outsourcing contractors and monitor their performance on a regular basis
- Is able to assist in project execution work related to boilers
- Is conversant with Implementation of TQM (5S, Kaizen, QCC etc.) and IMS system

Level 3-Developed

- Can prepare the preventive and predictive maintenance schedules and procedures
- Can plan and schedule jobs / activities
- Is fully conversant with planning and preparing the annual budget / budget of annual or planned shut-down
- Can make recommendations to Production on operational parameters so as to optimize the life of the equipment's
- Is able to recommend thorough cleaning/ preparation/ testing procedure to facilitate boiler inspection
- Can study the operation parameters and interpret the working of the Boiler vis-a-vis its design conditions to monitor its performance
- Can plan for overhauling, renovation, modification and upgradation of main Boiler / components
- Is fully conversant with technical features of boilers using different types of fuels
- Can guide in operation and maintenance of different types of boilers
- Can progressively monitor the consumption pattern of spare parts and components
- Is able to develop alternative suppliers for critical spare parts
- Is able to track and control the maintenance cost and guide in cost reduction initiatives
- Can decide on outsourcing of jobs to optimize the cost of maintenance

Level 4-Organizational Steward

- Can provide technical guidance on boilers using different types of fuel
- Can develop Boiler operation and maintenance manual
- Can keep track of the latest development in the field of boiler and related facilities
- Can recommend advanced process control and instrumentation system for the Boiler operation
- Is fully conversant with the latest amendment to Boiler regulatory Act and can guide the plant team
- Can scan, map and co-relate maintenance best practices, including establishment of benchmark metrics for various key performance indices
- Can recommend appropriate actions to improve asset life of Boiler
- Can provide technical inputs to Project Management at design engineering /execution stage
- Can guide in developing scope of work for outsourced O&M activities

Civil Construction Management

Description:

This competency may be defined as the combination of knowledge and skills required for carrying out the execution and completion of the civil construction projects within the defined scope, quality, time, cost and safety norms

Level 1-Novice

- Is aware of the various types of construction materials, machinery and tools, their specifications, prevailing rates, source of supply and storage and handling methods
- Is aware of relevant regulations, codes, standards, and safety norms
- Is aware of the basic engineering and detailed engineering aspects of a construction project
- Understands that project execution activities are to be accordance with the project specifications set, Policies /Guidelines / Systems and procedures laid down by the company and complying laws, rules and directives of Central /State Govt.
- Understands the need to take up execution of project at site within approved cost/budget and time
- Is aware of the work measurement methods

Level 2-Practitioner

- Is able to read and understand various types of drawings and construction plans for taking up execution of work at site
- Is able to read and understand the project specifications, Policies / Guidelines / Systems and procedures laid down by the company and complying laws, rules and directives of Central / State Govt.
- Can follow the schedule for execution of project at site within approved cost/budget and time
- Is able to initiate procurement action
- Is able to maintain the records of all the activities carried out on daily/weekly basis
- Can verify and check the material delivered at site along with relevant documents and notify any shortage or discrepancies to the concerned departments
- Is conversant with measurement of work on completion at different stages and preparation of bills
- Is able to read and understand "As Built" drawings for submission after completion of the project execution work
- Can implement Quality Control and Quality Assurance measures at site
- Is conversant with steps to reduce the wastage of material and understands the norms laid out by the company
- Is able to coordinate the activities of the contractors / sub-contractors
- Can implement Safety & Security measures at site complying with safety norms laid out by Government

Level 3-Developed

- Can identify and comply with legal and regulatory requirements for project activities
- Is able to plan and organize the work allocated to contractors/sub-contractors
- Can assign, allocate work / tasks and oversees all aspects of the day-to-day management of the project execution including site management
- Can organize mobilization and demobilization related to project work
- Is able to train and develop the subordinates and project staff to ensure that they are motivated and trained to carry out their responsibilities to the required standard
- Can plan and organize Safety & Security measures at site complying with safety norms laid out by Government
- Is able to identify variations on quantity / quality and can raise claims on time and value
- Can resolve resource-related issues and problems at site
- Is able to recommend / incorporate relevant codes and regulatory requirements at design stage itself
- Can review and analyze variations against contract terms and conditions
- Can monitor project progress and compare to program/timeline, initiate remedial action where necessary
- Is conversant with the financial aspects of a project

Level 4-Organizational Steward

- Can carry out analysis of the project from technical, financial, economic, social, institutional and environmental perspectives and provide recommendations
- Can carry out preparation of tender documents, inviting and opening of tenders, pre-qualification, perform contract / tender evaluation and analysis in order to award work
- Can review vendors' and contractors' drawings to ensure compatibility with other equipment and compliance with final contract documents
- Can recommend corrective and preventive actions for non-conforming situations observed during work execution
- Can develop and implement a master quality plan for the project, including site verification, quality control verification/testing and sampling plan, etc.
- Can develop risk management/mitigation plans
- Can incorporate explicit human and public safety considerations in design and all other project activities

Civil Maintenance

Description:

This competency may be defined as the combination of knowledge and skills required for carrying out the maintenance and improvement of all the constructed plant and administrative buildings and related facilities

Level 1-Novice

- Is aware of the various types of civil construction and maintenance materials, their specifications, prevailing rates, source of supply and storage and handling methods
- Is aware of the types of maintenance work generally required in plant, buildings and related facilities
- Is familiar with the types of machinery and tools required for the maintenance work
- Is aware of relevant regulations, codes, standards, and safety norms- this includes local engineering procedures and practices, as applicable
- Is aware of the requirement of various types of drawings and construction plans for taking up maintenance work at site
- Understands the need to take up periodic maintenance work for plant and buildings within approved cost/budget and time
- Is aware of the work measurement methods
- Is aware of the safety aspects to be taken up for the maintenance works

Level 2-Practitioner

- Is able to read and understand various types of drawings and construction plans for taking up maintenance work at site
- Can prepare the schedule for preventive and planned maintenance work at site and execute it within approved cost/budget /time
- Is able to coordinate and supervise day-to-day maintenance works at different work centres
- Is able to understand actions to be taken for resource-related issues and problems at site
- Is able to maintain documentation of all the activities carried out on daily/weekly basis
- Can inspect and check the material delivered at site along with relevant documents
- Is conversant with measurement of work on completion at different stages and preparation of bills
- Is conversant with the quality aspects related to the work
- Is conversant with steps to reduce the wastage of material and understands the norms laid out by the company
- Is able to coordinate the activities of the contractors/sub-contractors to ensure that the quality of workmanship and material are maintained as laid out by the company
- Can implement Safety & Security measures at site including medical and fire-fighting arrangements and complies with the safety norms laid out by the Government

Level 3-Developed

- Is able to plan and organize the work allocated to contractors / sub-contractors
- Can organize mobilization of manpower for carrying out the maintenance work
- Can review and monitor all the activities related to the Civil maintenance work carried out at site
- Can plan and organize preventive / upkeep of plant and, buildings and other related facilities
- Is able to train and develop the subordinates to ensure that they are motivated and trained to carry out their responsibilities to the required standard
- Can devise Quality Control parameters including monitoring standards and upkeep of documentation
- Can resolve resource-related issues and problems at site
- Is conversant with safety risks associated with processes. Identify relevant protection equipment and process modifications to mitigate safety risks
- Can review and analyze variations against contract terms and conditions

Commercial

Description:

This competency is defined as a combination of the knowledge and skills which enable the individual to understand all commercial activities and documentation related to purchase, logistics and taxation for procurement of raw materials/ spares / consumables and dispatch of finished goods from the plants

Level 1-Novice

- Is aware of the characteristics of the various products and intermediates produced in the plants
- Is aware of the capacity of all the plants and the quantity of off-take that needs to be moved out
- Is familiar with all safety aspects related to warehouse management
- Is familiar with the material handling equipment used in the plant and various other dispatch/redistribution points
- Is familiar with raw materials procurement & taxation-related procedures / documentation
- Is aware of the techno-commercial evaluation process of bids during procurement
- Is familiar with Contracts Management activities related to work and supply packages
- Is aware of the storing, packing and movement/transport requirements of the materials manufactured
- Is aware of the various material that are used for packing of the finished goods
- Is familiar with various documents required for movement of goods through different modes of transport
- Is aware of the role played by distributors, C&F agents, transporters) in the entire logistics process
- Is aware of the demur-rages, damages, pilferage's, losses and other commonly encountered problems in transport of goods
- Is familiar with various laws, regulations, acts and documentation required for export of goods
- Is familiar with the implementation process of productivity enhancement initiatives such as TQM, 5S etc.

Level 2-Practitioner

- Is conversant with the procedure for raising RFQs for Purchase / Capex / Contracts / Projects
- Can carry out techno-commercial comparison of bids
- Is conversant with the process of release of purchase or works orders and general / special terms and conditions
- Is conversant with procedures of arranging Payments against Proforma Invoice / Performance Bank Guarantee
- Is conversant with the storing, packing and movement / transport requirements of the materials manufactured at the plant
- Is conversant with the various material that are used for packaging of various products
- Can carry out execution of shipment with proper shipping marks of export and domestic dispatches in accordance to the approval from buyer
- Is conversant with the various laws, regulations, acts related to the export of goods
- Is conversant with all taxation- related documentation
- Is conversant with various documentation required for movement of goods within and outside the country through various modes of transport
- Is conversant with the methods to reduce the demurrages, damages, pilferages, losses and other commonly encountered problems in transport of goods
- Is conversant with the requirement for third party inspection in the case of export

Electrical Maintenance

Description:

The combination of knowledge and skills required for carrying out the maintenance and improvement of all the Electrical equipment and related facilities during the manufacture of various products / intermediaries

Level 1-Novice

- Is aware of the specifications/ material of construction/ operational features of / of all the electrical equipment and related facilities
- Is familiar with electrical engineering diagram
- Is familiar with different types of material., such as raw, In-process material and finished goods
- Is aware of safe operations of all the electrical equipment
- Is aware of the safety auxiliaries fitted on rotating/moving equipment like - coupling/belt guard, side boards, cages, barricades etc.
- Understands the importance of using right type/size of tools and tackles including those for use in the explosive area
- Is aware of the laid-down safety procedure to carry out any maintenance in the explosive premises
- Is familiar with regular non-destructive testing methods
- Is familiar with the working of firefighting and safety equipment
- Is aware of the basic maintenance practices such as preventive, routine, breakdown, annual turnaround plan etc. in terms of purpose and significance etc.
- Is aware of all assets in the plant in terms of their life, utilization levels, past behavior etc..
- Is familiar with operational features of mechanical equipment's and instrumentation system
- Understands basic civil construction methods like masonry, RCC etc. including materials for foundation works
- Is familiar with all the associated documentation

Level 2-Practitioner

- Is conversant with the purpose of each equipment in the process of manufacturing of different products in the plant and the electrical equipment/accessories related to the facilities
- Understands the power requirement of each equipment and the drive capacity
- Can read and interpret engineering drawings related to the electrical circuit and equipment layout etc.
- Is conversant with the specifications, construction features and materials of construction of all the equipment in the section
- Can identify the capacity of the Equipment's/accessories and recommend appropriate selection
- Is conversant with the calibration standards / methods of all measuring instruments
- Can specify the type of oils/ greases/lubricants (and the equivalents) required for each equipment and knows the proper methods of their storage / handling
- Can carry out Preventive and Predictive Maintenance
- Can undertake troubleshooting and checking of electrical interlocks / repairs of all electrical protection systems
- Can execute cable joints of various types and testing and repairs of lightning arresters
- Is conversant with use of appropriate types of tools available for lifting and transportation of equipment
- Can undertake repairs and testing of earthing and is familiar with Indian Electricity Rules, "code of practice for earthing" etc.
- Is conversant with tests as per Indian Standards and National Electrical Code
- Is conversant with tagging procedure and isolation of the equipment for repairs
- Is acquainted with all the instrumentation mounted on various equipment, their purpose, sensitivity and their mounting methods
- Can measure the lux levels at working areas and specify the appropriate lighting fixtures
- Able to select light / fixtures as per FLP / NFLP requirements, energy conservation initiatives such as use of LED or Solar lamps
- Can execute annual shutdown maintenance work as planned
- Can adhere to the statutory compliance, keep record of compliance and initiate corrective actions as per requirements
- Is able to continuously monitor the availability of spares and take appropriate steps to reduce the stock-outs
- Is conversant with the purchasing procedure, policies and can identify vendors, negotiate and ensure spare availability as per the requirement
- Is able to do vendor evaluation, set norms, parameters for evaluation and monitor the performance and take appropriate actions
- Is conversant with safety measures in the electrical installations during operation and maintenance
- Can collect and analyze maintenance data, failure patterns, MTBF, MTTR etc.. and initiate preventive and corrective actions
- Is conversant with ERP-related documentation

Level 3-Developed

- Can develop specifications for equipment's/parts, electrical distribution system / protections
- Can analyze failures of equipment and take appropriate action to avoid recurring failures
- Can design preventive and predictive maintenance methods, frequency, tools and instruments to be used for the same
- Can develop Standard Operating Procedures (SOPs) for electrical maintenance
- Can plan and execute modifications, de-bottlenecking etc.
- Is fully aware of the different types of equipment/parts available in the market and can identify the alternatives for existing ones
- Can plan and guide implementation of energy management initiatives
- Has thorough knowledge of the electrical safety and electricity rules
- Can recommend safety systems in the plant
- Can optimize consumption of spares
- Can utilize ERP for tracking and monitoring of inventory, budget, expenditure etc.
- Is able to plan, schedule and execute developmental projects related to electrical machinery
- Is able to plan the periodic shut-down jobs, taking into consideration the priority, backlogs and the resource requirements
- Can identify the tools & techniques for carrying out the predictive maintenance and other activities
- Can develop adequate performance measurement and management system
- Can carry out a FMEA (Failure Mode and Effects Analysis) for critical spares and plan corrective and control activities
- Can guide in building an indigenous supplier network
- Can analyze and choose any one between repair and replacement and frame guidelines in the above context
- Can carry out reliability assessment of critical spares
- Is able to formulate service-level agreements with key suppliers and monitor their performance on a regular basis

Level 4-Organizational Steward

- Is aware of the latest developments in electrical equipment design/ operational features
- Can scan, map and correlate maintenance best practices, including establishment of benchmark metrics for various key performance indices
- Can incorporate measures to increase MTBF (Mean Time Between Failures)
- Can recommend the latest NDT inspections in predicting the soundness of the equipment
- Can recommend modifications which will lead to lower power consumptions and higher productivity
- Can prepare and adhere to budget for revenue and capital expenditures through effective tracking and scheduling of activities as per plan
- Is well conversant with ERP for better inventory management, spare parts management and trend analysis
- Can make comprehensive evaluation based on economic, technological, proprietary information etc. for purpose of partial or in-toto outsourcing options of maintenance
- Can negotiate/form alliance and partnerships with key vendors and identify methods to reduce the overall spares costs for the plant
- Is able to institutionalize and integrate Total Cost of Ownership (TCO) concept in the pricing procedure

Formulations - Process & Technology

Description:

This competency may be defined as the combination of knowledge and skills required for determining the best equipment and process conditions in which the yields can be maximized and to increase the profitability of existing finished goods (products such as herbicides, insecticides, fungicides and other related products)

Level 1-Novice

- Can read and understand process flow sheet, equipment layout, plant layout, Process and Instrumentation Diagram etc.
- Is familiar with the principles, limitations and advantages of different unit operations
- Is aware of the design specifications to be considered for unit operations in the selection of the technology and required equipment's / components etc.
- Is familiar with the physical and chemical characteristics of raw materials, in-process materials, and finished goods of each production unit
- Is aware of the basics of milling, blending and liquid formulations operations and working of related equipment's / panel / PLC operations
- Is familiar with the operating parameters of the plant
- Knows the quality specification of the final product
- Understands the basics of various recipes used and the composition of each of them
- Is familiar with the SOPs used in the milling and blending operation
- Is familiar with the descaling operations and the purpose
- Is familiar with the sourcing and storage of raw materials, intermediates and packaging items for producing different products
- Is familiar with the chemistry and production processes of various products
- Is aware of the requirement and availability of utility systems such as water, power, etc. for producing various products
- Is familiar with the consumption norms of utilities and the yields for specific products as per design and rated capacity
- Is aware of the safety precautions as stipulated for each chemical and equipment used in the plant
- Is aware of the characteristics of various types of raw material and excipients used for blending
- Is familiar with the underlying reasons for pre-blending operations/Basic operation/ post-blending operation etc.
- Is familiar with the characteristics of the Raw Material / auxiliaries / utilities used for oil-based and water-based formulations
- Is aware of various types of the material and sizes used for solid / liquid packing
- Is aware of the scales and weight measuring instrument used
- Is aware of the types of instrumentation used to measure and control operating parameters
- Is aware of the basic information that needs to be made available / printed on the package both from user side as well as statutory requirements
- Is familiar with the basic tests used for sachets
- Is familiar with the documentation related to the plant operation

Level 2-Practitioner

- Is conversant with the various information that needs to be printed on the packets / sachets
- Can carry out the calibration of the weighing machines
- Can carry out the required tests on sachets and packing material to ensure that they are as per required specification
- Is able to collect, collate, compute and analyze operating data, utility consumption details and quality parameters relating to other similar plants
- Is able to implement the change proposed
- Is conversant with application and documentation related to SAP
- Can suggest changes in design specifications to be considered while selecting equipment's
- Can identify the bottlenecks in processes, products packing and other services and suggest solutions for troubleshooting
- Can provide value-added inputs received from different sources to operating personnel
- Can prepare proposals of energy savings and its optimal use together with their economic evaluation
- Can review the proposals technically for modifications related to equipment layout, piping and equipment design etc. prepared by plant personnel
- Understands detailed physical and chemical specifications and characteristics of all the materials handled at the plant
- Is conversant with the operation of plant and machinery used for milling, blending and packaging
- Is able to carry out the operations based on the SOPs
- Is conversant with the basic maintenance aspects of the equipment's
- Is conversant with the use of the PPEs and other safety items
- Can co-relate the operating data in determining optimum process conditions
- Uses the recipe and maps the output quality to the standards required and suggests to R&D about the changes that need to be made
- Is able to maintain the log of the required parameters
- Is able to use /adhere to the basic safety precautions during operations
- Can map the changes in the final product quality based on changes in the input raw material
- Can use the substitute excipient material in making the formulation especially in the absence of the standard requirement
- Is able to ensure that there are minimal losses during charging
- Is able to take appropriate action in case of QC issues
- Understands the characteristics of the various inputs materials and the implication of changes in the same on the output product
- Can take decision on input material quality variance, after due clearances
- Can carry out the computation of the filling based on the SPG of the material

Level 3-Developed

- Is able to develop methods to improve the feed rate at the cycle times without impacting the product quality
- Can carry out the loss analysis (input-output analysis) and suggest methods of reducing the same
- Is able to explore new methods of milling which increases the output and reduces costs
- Can advise on capacity planning process with regards to the milling operations
- Can co-ordinate with R&D in carrying out trial batches of new formations or existing formulations with new combinations
- Can provide R&D with feedback on the process and / or final product based on knowledge / information gained during operations
- Can consider end-user feedback and requirement as and when it emanates for improving the product /packaging
- Is able to collect and collate data on the raw material, excipient used, output volumes and its quality to R&D
- Can work in close conjunction with R&D / Process improvement to explore and / or help carry out pilot scale batches using new material (esp. excipients)
- Can work with Process / R&D based on historical data, for optimizing the usage of various material also the utilities required, including temperature for chilling operation
- Can compare the results of operating the process at various parameters to assess the performance of various equipment and improve them
- Can bring back into normality any abnormality observed in the plant
- Is aware of the latest development in equipment designs
- Is able to scan the markets for alternative packaging material with lower cost, better quality and higher reliability
- Is able to scale-up plant and equipment for increased capacity
- Is able to use statistical tools for carrying out trend analysis
- Can plan and arrange market research for new products and for existing major product re-launch or development
- Can monitor the customer complaints and ensures that they are effectively resolved along with the internal stakeholders

Level 4-Organizational Steward

- Can suggest improvements in milling, blending and formulations including packaging operations keeping in view global best practices
- Is aware of the emerging trends in value-added products
- Can proactively map changes in the environment/pollution policies/regulation to the equipment/processes/materials in the plant and also recommend appropriate changes
- Can make suggestions or modifications so as to improve efficiency, automation of critical operations etc.
- Can recommend proper equipment to reduce energy consumption
- Can plan, organize and execute the start-up and commissioning activities of similar plant
- Can prepare Basic Engineering documentation for a new Formulations plant
- Can provide technical inputs to during detailed engineering stage
- Is able to identify sources of know-how for advanced technology / equipment

Maintenance Planning

Description:

This competency may be defined as the combination of knowledge and skills required for planning the maintenance work and improvement of the equipment and related facilities during manufacture of various products/intermediaries

Level 1-Novice

- Is familiar with the operational features of mechanical and electrical equipment's and instrumentation
- Is aware of the basic maintenance practices such as preventive, routine, breakdown, annual maintenance, annual turnaround plan in terms of purpose and significance etc.
- Understands the material codification system followed in the company, part descriptions etc.
- Is familiar with the engineering drawings and the procedure for carrying out revisions
- Is aware of the regular non-destructive tests like - vibration analysis of rotary equipment, thickness testing of tanks, vessels, piping etc., skin temperature of insulated items etc.
- Understands the equipment alignment terminology and the purpose and importance of alignment for rotating highspeed machines
- Is aware of the laid down safety procedure and use of special tools to carry out maintenance in the explosive premises
- Is able to identify requirements of Spare Parts / Consumables / lubricants
- Is familiar with the spare parts purchasing process from raising of purchase requisition to goods receipts
- Is familiar with the basic stores operations; storing, goods receipt & goods Issue and the related documentation
- Is familiar with the ERP used for maintenance work
- Is familiar with 5S, TQM etc. and can assist in implementing such initiatives
- Is familiar with the physical and chemical characteristics of raw materials, in-process materials, finished goods, effluents and emissions of each production unit

Level 2-Practitioner

- Is able to plan the weekly and daily maintenance activities taking into consideration the priority, the resource requirements etc.
- Is able to estimate and plan the time, manpower, spares and other requirements
- Can schedule the activities in a proper manner to reduce the overall non-productive hours
- Can generate the maintenance plans for the plant through the use of ERP
- Is conversant with all types of safety permits necessary for initiating maintenance jobs
- Is conversant with the company's safety policy, environment policy and social policy
- Is familiar with the norms set by inspectorates of factory, boilers, and explosives and can take cognizance of these in carrying out maintenance and to comply with documentation
- Is able to carry out works related to shut-down / annual turn-around using project management tools
- Can prepare & release work orders/maintenance orders etc. through ERP
- Can collect and analyze maintenance data, failure patterns, MTBF, MTTR etc. and initiate preventive and corrective actions
- Is conversant with the process and implementation of 5S, TQM etc.

Level 3-Developed

- Is able to plan the monthly, half-yearly, Annual Turnarounds etc. taking into consideration the priority, backlogs and the resource requirements
- Can identify mandatory and discretionary preventive maintenance activities for weekly / monthly / yearly basis
- Can identify the tools & techniques for carrying out the predictive maintenance and other activities
- Can carry out accurate estimation for large maintenance works such as shutdown, annual turnarounds etc.
- Can execute large maintenance works such as annual turn-around, commissioning, projects, modifications etc.
- Can shortlist and select contractors / vendors and suppliers and monitor their performance
- Can develop adequate performance measurement and management system for the maintenance function and
- benchmark the indicators such as MTBF, MTTR etc.
- Is able to generate the demand plan of spare inventories in a scientific manner
- Can carry out a FMEA (Failure Mode and Effects Analysis) for critical spares and plan corrective and control activities
- Can provide critical inputs and support to vendors in indigenizing the spares
- Understands the trade-off between repair and replacement and frames guideline for the department in the above context
- Is able to formulate service-level agreements with key suppliers and monitor their performance on a regular basis

Level 4-Organizational Steward

- Can scan, map and correlate maintenance best practices, including establishment of benchmark metrics for various key performance indices
- Can make comprehensive evaluation based on economic, technological, proprietary information etc. for purpose of partial or in-toto outsourcing options of maintenance
- Can negotiate/form alliance and partnerships with key vendors and identify methods to reduce the overall spares costs for the plant
- Understands the Total Cost of Ownership (TCO) concept and is able to institutionalize and integrate it in the pricing procedure
- Can recommend methods to streamline spare parts management and also eliminate inconsistencies in the system

Material Handling

Description:

This competency may be defined as the combination of knowledge and skills required to understand the characteristics of various raw materials, finished goods and waste materials and to identify / use appropriate equipment for handling, storing and transporting these bulk materials in a safe, economic

Level 1-Novice

- Can read and understand process flow sheet, equipment layout and plant layout
- Is familiar with the chemistry and manufacturing processes of various products
- Is familiar with the characteristics of raw materials, in-process materials, finished goods, effluents and emissions of each production unit
- Is familiar with the sourcing and storage of raw materials for different products
- Is familiar with the parameters to be analyzed for different materials handled / types of analytical reports
- Is familiar with the operation and basic maintenance of material handling equipment
- Is familiar with the electrical equipment's and instrumentation
- Is aware of the scope of work outsourced in the section
- Is aware of the requirement of periodic physical verification of material stored in yard
- Is aware of the procedures of material loading for transport through road and rail, as applicable
- Is aware of the safety, health and environment compliances to be followed
- Is familiar with types of personal protective equipment and their use
- Is familiar with 5S, TQM etc. and can assist in implementing such initiatives

Level 2-Practitioner

- Is conversant with the physical and chemical characteristics of the bulk material handled
- Is conversant with the layout of the plant and machinery related to the section
- Is conversant with the operation and basic maintenance of material handling equipment's
- Is conversant with the requirements of bulk materials (raw materials, in-process materials, finished goods etc.) for each plant
- Is conversant with the standard calibration method for weighing and measuring equipment's
- Can define the scope of work, award contract and manage the contractors to execute the outsourced activities
- Is conversant with electrical equipment and process control instruments used in the section
- Understands the characteristics of the solid waste and effluents being generated in the plant, their treatment and disposal methods
- Can plan and carry out periodic physical verification of material stored in yard
- Is conversant with the procedures of material loading for transport through road and rail, as applicable
- Is aware of the safety, health and environment compliances to be followed
- Has a thorough understanding of the various environmental protection/support systems available / used in the section
- Is conversant with the use of types of personal protective equipment
- Can carry out implementation of initiatives such as 5S, TQM etc.

Level 3-Developed

- Is fully conversant with the effective operation and maintenance of material handling equipment's with optimum manpower and energy cost
- Is fully conversant with the PFD and control system and can recommend changes to improve the operations
- Can diagnose any malfunctioning in the process and suggest remedies
- Can guide in attending to any operational emergencies
- Can guide in yard management activities for effective space utilization
- Can diagnose the functioning of each equipment from the operational data and suggest modifications, repairs etc. of
- the equipment during planned shutdown
- Can guide the SCM department in procurement / fabrication of the new equipment / components for bulk material handling
- Can review and progressively improve operating procedures of every equipment
- Can develop SOPs / training manuals
- Can assist in forecasting to plan future orders of bulk material
- Can suggest modifications / improvements on the safety, health and environmental issues pertaining to the section

Level 4-Organizational Steward

- Is fully conversant with the advanced technologies worldwide for bulk material handling operations
- Can progressively recommend improvements in the layout, equipment design / replacement for improving the productivity
- Can improve energy consumption, optimize manpower and increase automation in the section
- Can recommend integration of any new system without affecting present operations
- Can develop / recommend automation to reduce manpower and cycle time
- Is fully conversant with the cost-benefit analysis of yard management for raw material/finished goods
- Can proactively map changes in the environment / pollution policies / regulation to the equipment / processes / materials in the section and also recommend appropriate changes

Mechanical Maintenance

Description:

This competency may be defined as the combination of knowledge and skills required for planning the maintenance work and improvement of the equipment and related facilities during manufacture of various products/ intermediaries

Level 1-Novice

- Is familiar with the characteristics of all the raw materials, intermediates and final products
- Is aware of the process involved in the manufacturing of various products / intermediaries
- Is aware of the specifications/ material of construction/ operational features of all the mechanical equipment and related facilities
- Is familiar with operational features of electrical equipment's and instrumentation and control system
- Is familiar with plant and equipment layout and piping diagram
- Is aware of the basic maintenance practices such as preventive, routine, breakdown, annual turnaround plan etc. in terms of purpose and significance etc.
- Understands the characteristics and applications of various materials of construction
- Is familiar with regular non-destructive testing methods and applicable tools
- Is familiar with the types and methods of storing common spares and consumables
- Is able to understand basic fabrication operations
- Is aware of safe operations of all the equipment
- Is aware of the laid-down safety procedure to carry out any maintenance in the explosive premises
- Is familiar with the working of fire-fighting and safety equipment
- Understands basic civil construction methods like masonry, RCC etc. including materials for equipment foundation works
- Is familiar with project execution activities
- Is familiar with all the associated documentation

Level 2-Practitioner

- Is conversant with the construction features and duty conditions of various equipment in the plant
- Is conversant with the handling of appropriate types of tools and tackles available for lifting and transportation of equipment
- Can read and interpret all the equipment design and layout drawings and manuals
- Can carry out routine, preventive, predictive and planned maintenance activities as per drawn out schedule
- Is able to continuously monitor the availability of spares and take appropriate steps to reduce the stock-outs
- Is conversant with the purchasing procedure and can identify vendors, negotiate and ensure spare availability as per the demand plan
- Can carry out non-destructive tests for all the critical equipment's to analyze the performance
- Can collect maintenance data, failure patterns, MTBF, MTTR etc. and initiate preventive and corrective actions
- Is conversant with statutory compliance matters and related documentation
- Is conversant with the present Indian and international safety rules
- Is conversant with all types of safety permits necessary for initiating maintenance jobs
- Is able to implement cost management initiatives in maintenance
- Can evolve action plans to enable the company achieve the objectives of S H E policy
- Is able to review service-level agreements with key suppliers / outsourced contractors and monitor their performance on a regular basis
- Is conversant with Implementation of TQM (5S, Kaizen, QCC etc.) and IMS system

Level 3-Developed

- Can establish norms and systems for the maintenance function
- Can prepare the preventive and predictive maintenance schedules and procedures to minimize equipment downtime
- Can plan and schedule jobs / activities / budget of annual / planned shut-down
- Is fully conversant with planning and preparing the annual budget
- Can study the operation parameters and interpret the working of the equipment vis-a-vis its design conditions to monitor its performance
- Can interpret the statutory rules and regulations / amendments related to the plant equipment's and guide personnel on these issues
- Can specify the right equipment and accessories for use at plant
- Can analyze non-destructive test results for all the critical equipment's to bring about improvements
- Can plan for overhauling, renovation, modification and upgradation of equipment's
- Can progressively monitor the consumption pattern of spare parts and components
- Is able to develop alternative suppliers for critical spare parts
- Is able to track and control the maintenance cost and guide in cost reduction initiatives
- Can decide on outsourcing of jobs to optimize the cost of maintenance
- Is fully conversant with the worldwide developments in the equipment's of plants
- Is able to carry out trend analyses and determine the best life of critical components of equipment
- Can take appropriate action to improve asset life of plant and machinery
- Can guide in implementation of TPM and other productivity enhancement initiatives

Level 4-Organizational Steward

- Has thorough knowledge of the process and the co-relation to the equipment design
- Has thorough knowledge of chemistry and metallurgy and can recommend measures to enhance equipment life
- Can guide towards achieving lowest maintenance cost and maximum equipment availability
- Can develop corporate strategy for procurement of equipment, components and spares
- Is familiar with competing technologies, their special features with reference to maintenance cost and can recommend adopting these features in the existing plant
- Can suggest measures to increase Mean Time Between Failures (MTBF) and reduce Mean Time to Repair (MTTR)
- Keeps track of global changes on maintenance practices and recommend new initiatives at plant
- Is aware of the latest amendment in regulatory act and educates others on it
- Is able to provide technical inputs to project management team during project planning and execution
- Can scan, map and co-relate maintenance best practices, including establishment of benchmark metrics for various key performance indices

Process Control & Instrumentation Maintenance

Description:

This competency may be defined as the combination of knowledge and skills required for carrying out testing, installation and maintenance of Process Control and Instrumentation systems during manufacture of various products / key intermediaries

Level 1-Novice

- Is able to understand the P&I and Process Flow Diagrams of the processes of the plant
- Understands the process chemistry involved in the manufacturing processes of various products/intermediaries
- Is familiar with the type of various process instruments and their working ranges
- Is familiar with all the spare parts and consumables related to instrumentation and controls
- Is able to differentiate various material of construction
- Is familiar with the operational features of mechanical and electrical equipment's
- Is aware of all test equipment in the instrumentation workshop for testing and calibration
- Understands the concepts of fail-safe, fail-danger positions of the instrumentation etc.
- Is aware of the basic maintenance practices such as preventive, routine, breakdown, annual turnaround plan in terms of purpose and significance etc.
- Is aware of the requirement of those instruments for which statutory compliances are involved
- Is aware of applicable legal / statutory rules and laws
- Is able to differentiate on types of compliances, metrology compliance, wireless device compliance etc.
- Is familiar with ERP concepts, procedures, their application and associated documentation
- Is familiar with installation and connecting procedures of all types of field instruments
- Is familiar with types and specification of cables used for Instrumentation
- Is able to differentiate between various components of Control Panel and their ratings
- Can identify various units/sub-assembly of the special equipment/vendor packages and the prescribed spares for these
- Has basic knowledge of the computer system, Working of the SCADA system/ DCS system
- Is aware about the checklist, testing procedures, knowledge of the Software and programming of the system
- Is aware about the communication protocols and its hardware connectors
- Is familiar with the safety precautions to be taken at the plant
- Is familiar with 5S, TQM etc. and can assist in implementing such initiatives

Level 2-Practitioner

- Understands the basic principle of all field instruments
- Can identify need of a particular type of field instrument for a specific application
- Can interpret the vendor operating/maintenance/spare parts manuals
- Can carry out the scheduled maintenance/Preventive and predictive maintenance/ break-down maintenance activities
- Is able to verify the range of the process parameter which will fall under the given specific range
- Is able to understand suitability of materials with the medium being handled and the external environment
- Understands the mechanical and chemical properties of the material of construction of instruments
- Can plan and schedule the maintenance in line with the OEM recommendation / Predictive maintenance using appropriate tools
- Is able to identify the frequency of replacement of critical components
- Is conversant with minimum stock to be maintained for spares and their reorder levels
- Can optimize the consumption of spares and consumables
- Is conversant with proper documentation to carry out any activity in the field related to instrumentation
- Can carry out calibration of these instruments by comparing to the standards
- Can read and interpret operating manual, service manual and part-list manual of pneumatic / electronic recorders, receivers, indicators and controllers, scanners etc.
- Can identify the ratings of the Control Panel components and UPS and recommend appropriate instrument / component
- Is able to co-relate module with Field instruments, its selection and suitability as per standard
- Is able to decide the rating of the battery as per the required power backup
- Is able to identify the frequency of replacement / recommend necessary changes in Switchgear based on failures observed
- Can identify the network hierarchy related to SCADA/DCS and troubleshoot the same
- Is able to verify whether the range of the process parameter will fall under the given specific range
- Can develop / update the SOP of the Calibration procedures
- Can conduct all tests as per SOP using test equipment
- Is able to maintain the Master calibration instruments
- Is able to understand compliance of Weighing balance, Wireless device, Outlet flow meters and carry out timely calibration of the same

Level 3-Developed

- Can develop the specification sheets of the field instruments and Control Panel based on the process requirement to get the maximum life of the instruments / system
- Can decide on the compatibility level of an instrument /system for a particular application
- Can review the system and recommend preventive and predictive methods to avoid failure of the instruments / enhance reliability and maintenance efficiency
- Is able to recommend the suitable materials understanding the usage in similar industry across the world
- Is able to recommend any treatment materials like - lining, coating, spraying to improve the suitability of the existing material, without going for replacement
- Can analyze the effectiveness of the existing maintenance schedule/practices and recommend appropriate measures to enhance maintenance efficiency
- Can carry out review of the equipment's and protection system to safeguard the other equipment's and recommend advanced version
- Can analyze the consumption of the critical components and provide suitable recommendations for any new or improved version available in global market
- Can review the working of SCADA / DCS system and recommend any preventive and predictive methods to avoid failure of the system /instruments
- Can enhance process efficiency by converting manual operations to auto operations wherever possible
- Can prepare detailed specifications for equipment's and spares
- Is fully conversant with techno-commercial evaluation of bids and spares
- Can prepare operation and maintenance manuals of all instruments and can conduct awareness programs of DCS to all plant personnel
- Can constantly monitor the performance of the test and calibration equipment and their capability to do accurate calibration
- Understands the trade-off between repair and replacement and frames guideline for the department in the above context
- Can identify the tools & techniques for carrying out the predictive maintenance and other activities
- Is able to plan the monthly, half yearly, Annual Turnarounds etc. taking into consideration the priority, backlogs and the resource requirements

Level 4-Organizational Steward

- Can decide on the suitability of a new or improved version of instrumentation available in global market
- Can conceptualize and design central process control systems for better process efficiency and minimize manual handling of operation
- Can evolve preventive maintenance systems to minimize breakdowns
- Has thorough knowledge on ISO and ERP related matters concerning instrumentation
- Can guide in the preparation of Detailed Project Report (DPR) for an instrumentation project
- Can scan, map and correlate maintenance best practices, including establishment of benchmark metrics for various key performance indices
- Can make comprehensive evaluation based on economic, technological, proprietary information etc. for purpose of partial or in-toto outsourcing options of maintenance
- Can negotiate/form alliance and partnerships with key vendors and identify methods to reduce the overall spares costs for the plant
- Can recommend methods to streamline Spare parts Management and also eliminate inconsistencies in the system
- Has thorough knowledge about the changing trends worldwide in Process Plant Instrumentation comprising various types of Field Instruments, Control Panel systems, DCS, Testing & Calibrating Equipment's etc.
- Is able to select the right type of instrumentation and test equipment's considering capital cost, ease of operation and maintenance, reliability, operating cost etc.

Process Engineering

Description:

The competency may be defined as the ability to determine the best equipment's and conditions in which the yields can be maximized and to increase the profitability of existing products / develop new products

Level 1-Novice

- Understands the fundamentals of Boiler operations and the various maintenance and safety related aspects of the same
- Can read and understand process flow sheet, equipment layout, plant layout, Process Instrumentation & Control Diagram
- Is familiar with the chemistry and manufacturing processes of various products / intermediaries
- Is familiar with the characteristics of raw materials, in-process materials, finished goods, effluents and emissions of each production unit
- Is familiar with the sourcing and storage of raw materials
- Is aware of the requirement and availability of utility systems such as water, power, steam, cooling water etc. for producing various products
- Is familiar with the operational features of mechanical and electrical equipment's
- Is aware of the types of process instrumentation and control system used in different plants
- Is familiar with the process requirements for a new product development
- Is aware of the safety precautions as stipulated for each chemical used in the plant
- Is familiar with types of personal protective equipment and their uses
- Is familiar with 5S, TQM etc. and can assist in implementing such initiatives
- Is familiar with the documentation related to the process of producing various products and the analytical reports from laboratory

Level 2-Practitioner

- Understands detailed physical and chemical specifications and properties of all the chemicals handled
- Is conversant with the conditions which may affect a particular reaction and can suggest steps to prevent them
- Understands the principle of operation of various process equipment's
- Is able to decide on the process selection / application for different processes
- Understands the exothermic / endothermic properties of the reaction at given stoichiometric ratios and can calculate the total energy transfer for a given volume and its rate of transfer
- Is conversant with the best conditions to be maintained with respect to pressure, temperature, pH etc. for optimum yields
- Understands the design aspects of the equipment's
- Is acquainted with the hazardous nature of the chemicals and the mixtures to take necessary precautions while charging, discharging, pumping and transfer
- Can suggest changes in design specifications to be considered for a chemical processing flow-path/stream for the selection of equipment's
- Can specify types of instrumentation needed to measure chemical process parameters
- Can identify the bottlenecks in processes, products packing and other services and suggest solutions for troubleshooting
- Can carry out the trend analysis of operations in the plant
- Can provide inputs to scale up basic process data to commercial plant level
- Can implement new processes for taking up new product development

Level 4-Organizational Steward

- Is aware of the changes worldwide in related technologies
- Can evaluate a project strategically and identify the most appropriate technology
- Can recommend suitable actions on any kind of reactions to achieve the desired objectives
- Is fully conversant with the rate controlling mechanisms of a reaction and can decide upon the process conditions/steps etc.
- Can use HAZOPS and fault-tree analyses in process design
- Understands environmental constraints and can incorporate these into process synthesis
- Can provide inputs to the management with respect to the trends, market share, growth potential and competitor movement
- Can prepare financial and strategic plans for new product concepts

Process Improvement

Description:

This competency may be defined as the combination of knowledge and skills required for identifying, planning and executing the improvement projects on the characteristics of existing products/packaging and also scaling up to plant level, the studies related to new product or process development done by R&D, which are technically and economically feasible and viable

Level 1-Novice

- Is familiar with the process flow sheet, equipment layout, plant layout, P&I Diagram etc. related to the products/intermediaries manufactured
- Understands the process chemistry involved in the manufacturing processes of various products/intermediaries
- Is familiar with the operational features of mechanical and electrical equipment's and instrumentation
- Is aware of the SOPs that are laid down for the manufacture of products/intermediaries
- Understands the design features to be considered for the selection of the technology and equipment
- Is familiar with the sourcing and storage of raw materials, intermediates, solvents etc. for producing different products
- Understands the consumption norms of utilities and the yields for specific products as per rated capacity
- Is aware of the quantity and quality of all effluent / by- products stream
- Is able to work in coordination with R&D to study the plant performance in terms of productivity, quality, yield and safety
- Can identify the areas or sections where process can be improved
- Is familiar with various improvement tools, such as 7 QC tools, for data capture and analysis
- Is aware of the need for transferring the findings of R&D as identified as feasible for scaling up to plant-level projects
- Can highlight variations / deviation and other concerns to help trigger the process improvement process
- Is familiar with the safety precautions to be taken at the plant
- Is familiar with 5S, TQM etc. and can assist in implementing such initiatives

Level 2-Practitioner

- Understands the principle of operation of different types of equipment and process instrumentation
- Is conversant with the best process conditions to be maintained with respect to pressure, temperature, pH etc. for achieving high productivity
- Carries out analysis of plant performance based on real time/historical information, compare them with standards and identify areas of improvement / rectification
- Is able to review performance of the plant periodically with the production, maintenance and R&D
- Is conversant with the hazardous nature of the chemicals and precautions to be taken to ensure safety
- Is conversant with various process control equipment, DCS, PLC and the information that can be generated from them
- Is able to consider various options to remove the bottlenecks in processes, products packaging and offsites
- Can prepare the technical proposals for modifications related to process layout, piping and equipment design etc.
- Can prepare the trend analysis of operational parameters in the plant
- Is able to scale-up basic process data derived by R&D, to pilot / commercial plant levels
- Can perform evaluation of any changes proposed in the plant for resulting in yield increase, operational and
- maintenance convenience, IRR, ROI, hazards reduction etc. in the long run
- Can work with internal project and /or external service providers to execute the project (large scale and small changes)
- Is conversant with 5S, TQM etc. and can assist in implementing such initiatives

Level 3-Developed

- Can identify, based on historical trends, the areas upstream and downstream to the process, to R&D for bringing about improvements
- Is able to suggest based on the product, alternate for MOC, PLC, DCS which will help in process management as well as capturing information about process
- Is aware of the latest development in equipment designs to perform a given unit operation or process with much ease in operation and less motive power
- Is conversant with process simulation software for process development
- Can work with vendors of equipment, machinery etc. and R&D to explore implementation of emerging methods in the process - both existing and intended
- Is able to scale-up plant and equipment for increased capacity
- Provides critical inputs for CAPEX layouts for process improvement, by creating the detailed business case for the same
- Can suggest / recommend process equipment / instrumentation which are contemporary and can meet the current and future business requirements
- Can develop new SOP/PFD as per the new process layout / design and stabilize plant with revised capacity & consumption norms
- Can monitor and ensure that the ROI for projects is in line with the requirement / plan
- Can work with Toll Manufacturers to help them in their Capex and other improvement projects
- Can transfer process technology from lab / pilot plant to full scale production

Level 4-Organizational Steward

- Is aware of the changes in related technologies worldwide
- Is conversant with types and availability of advanced technology/equipment world-wide
- Can interact with technology consultants on technical matters
- Creates enterprise-wide framework with respect to processes which help in improvement of plant performance
- Can evaluate the feasibility and viability of a project in association with R&D and identify the most appropriate technology
- Understands environmental constraints and can incorporate these into technological changes planned for execution
- Can give inputs to develop financial and strategic plans for new product concepts
- Can scan global best practices for equipment and process monitoring and maps scope for their implementation in the organization
- Can recommend best practices of management of change across areas and functions to strengthen process-related MOC
- Creates enterprise-level data integration process - which seamlessly integrates all relevant information in a real-time scenario

Process Safety

Description:

The set of knowledge elements which enables one to understand and adopt appropriate steps for adhering to / maintaining process safety, during manufacture of various products / intermediaries

Level 1-Novice

- Understands the critical aspects in the manufacture of various products which have a bearing on safety
- Is aware of various aspects which impact the health of the worker, including chemical properties of raw materials, in process materials and finished products, their handling methods, pollutants and hazardous material/gases generated etc.
- Is aware of the safety objectives of the plant in terms of the statutory regulation (e.g., storage of hazardous chemicals), enforcement methods, precautionary steps and emergency procedures
- Is aware of the hazards & risks associated with handling of hazardous materials used in the plant Is aware of precautions / permit systems to be used in the plant while attending to any maintenance work on the equipment handling hazardous material
- Is aware of the routine documentation and also special documentation to be prepared in aspects pertaining to safety, its enforcement and reporting
- Is aware of safe practices initiative such as 5 S
- Is aware of the various legal matters pertaining to worker health and safety Is aware of the available PPEs and their application / SOPs in various operations
- Is aware of all the fire and safety equipment, checklist for their upkeep & their usage for specific activities
- Is familiar with the Disaster Management Plan prepared for the storage facility/handling of various chemicals and solvents
- Knows about the need and types of Mock Drill, Fire Drill, Table Top Drill etc.
- Is aware of the requirement of stipulated man-days training per person, training material and the schedule

Level 2-Practitioner

- Is able to adhere to the organizational policy on Safety
- Is conversant with the critical aspects during production of various products and utilities which have a bearing on Safety
- Is conversant with the safety objectives of the company
- Is conversant with the hazards & risks associated with handling / storage of hazardous materials and can attend to emergencies
- Can assist in framing the educational and training needs for employees to maintain and ensure a safe working place
- Is conversant with the routine documentation and also special documentation to be prepared in aspects pertaining to safety, its enforcement and reporting
- Can implement safe practices initiatives such as 5 S
- Has wide knowledge of the various aspects which impact the health of the worker, including chemical properties of raw materials, in-process goods and finished products, their handling methods, hazardous emissions and effluents
- Is conversant with the various statutes pertaining to worker health and safety
- Is able to implement and monitor the Safety systems & Procedures
- Is able to communicate the hazards due to process properly to all concerned personnel
- Is able to issue the necessary permits after ensuring the compliances
- Can ensure safety-related documents are completed & updated
- Ensures compliances and responds to queries raised by the regulatory authorities
- Is conversant with procedures for process safety audit

Level 3-Developed

- Is conversant with national and international safety norms so as to ensure that product sale is not affected due to noncompliance of any of these norms
- Is able to guide the personnel in the compliance of current statutory standards and procedures related to process safety
- Can guide the production and maintenance teams in setting up safety systems for handling and storage of hazardous chemicals
- Is able to develop and update the Safety guidelines, systems and procedures
- Can conduct safety audits and recommend appropriate measures for enhanced safety standards
- Can give technical inputs in risk identification and suggest mitigation methods
- Can formulate training programs to achieve best safety norms in the related sector
- Can interact with the statutory bodies and guide in complying with necessary documentation and norms

Level 4-Organizational Steward

- Is able to develop new techniques in measuring Safety standards and performance
- Can design Safety systems and procedures for a process plant
- Can recommend measures to ensure Safety norms at selection of technology stage/ design of equipment itself
- Can suggest the need to make changes in statutory regulation
- Can impart knowledge on Safety to various stakeholders in the industry

Product Development

Description:

This competency may be defined as the combination of knowledge and skills required for identifying, planning and executing the development of new products or improving existing products so that the company can meet customers' needs more effectively

Level 1-Novice

- Is familiar with the process flow sheet, equipment layout, plant layout, P&I Diagram etc. related to the products/intermediaries manufactured
- Is familiar with the process chemistry involved in the manufacturing processes of various products/intermediaries
- Is familiar with the operational features of mechanical and electrical equipment's and instrumentation
- Is aware of the SOPs that are laid down for the manufacture of products/intermediaries
- Is aware of the need for transferring the findings of R&D as identified as feasible for scaling up to plant-level projects
- Is familiar with the characteristics of all existing products manufactured
- Is aware of the characteristics of the packing material and labeling methods/standards
- Is familiar with the safety precautions to be taken at the plant
- Is familiar with 5S, TQM etc. and can assist in implementing such initiatives

Level 2-Practitioner

- Is conversant with the characteristics of all existing products manufactured
- Is conversant with the characteristics of the packing material and labeling methods/standards
- Is able to collaborate with marketing, technical and manufacturing specialists throughout the product-development process
- Is able to find out what customers want from a product, how they use it and why they prefer certain product features over others
- Is conversant with all regulation issues and competitor business
- Is conversant with the process of pricing for individual product
- Can allocate appropriate resources for product development project
- Can manage the product development process from the concept phase to the post-launch analysis phase
- Can perform product testing as per SOPs laid out
- Can prepare required documents for the cycle of product development
- Is able to work with other departments to establish a design, technology, product development, vendor strategy and compliance issues
- Is able to ensure that labeling and marketing/promotional literature match new product specifications
- Is conversant with 5S, TQM etc. and can assist in implementing such initiatives

Level 3-Developed

- Can carry out research and monitor existing client base and industry developments and identify potential new product opportunities
- Can develop SOPs for product development process
- Can plan and formulate budget for product improvement or development project, equipment and human resource requirements, time required etc.
- Can prioritize projects for product development
- Can guide and administer all product development projects and ensure completion within required time-frame
- Can advise on all aspects of product such as pricing and legal requirements
- Can manage project budget and prepare financial analysis reports for top management
- Can continually review, evaluate and enhance the current product offering
- Can ensure that all product development communications are made effectively, internally and externally
- Can evaluate and resolve technical feasibility, design optimization and production issues
- Can develop labeling and marketing / promotional literature matching new product specifications
- Can negotiate contracts with consulting firms to perform research or other applicable studies or support

Level 4-Organizational Steward

- Is aware of the changes in related technologies worldwide
- Can create enterprise-wide framework with respect to processes which help in improvements and innovations related to products
- Can evaluate the feasibility and viability of a product development project in association with R&D and Production and identify the most appropriate processes / technology
- Can guide on matters related to environmental constraints and can incorporate these into technological changes
- planned for product improvement / new product development
- Can give inputs to develop financial and strategic plans for new product concepts
- Can recommend which products to develop or retire

Product Packaging

Description:

This competency may be defined as the combination of knowledge and skills required for transportation, bulk storage, weighing, bagging, stacking, loading products into the transport & managing work force for the above activity

Level 1-Novice

- Is aware of the physical and chemical characteristics of the products to be packed
- Is familiar with the unit operations involved like - conveying, storage, weighing, packaging, stacking and loading
- Is aware of the basic construction features of the major Plant and Machinery used in the packaging plant
- Is familiar with the operation of the above equipment's
- Is familiar with the standard calibration method for equipment's
- Is aware of the suitable packing material and labeling required
- Is aware of the safety systems followed in the plant
- Is aware of various process measurement and control instruments used in the plant
- Is familiar with the space available in the finished goods yard for stacking
- Is aware of the maintenance issues associated with the equipment
- Is aware of the waste being generated in the process and its disposal method
- Is aware of the pollution treatment equipment in the section

Level 2-Practitioner

- Is conversant with the physical and chemical characteristics of the products to be packed
- Is conversant with the processes involved in finished goods packaging plant
- Can read and interpret the process flow diagram (PFD) and piping and instrumentation diagram (PID)
- Is conversant with the layout of the packaging plant and machinery
- Can operate the packaging plant to ensure that complete production is transported and/or bagged
- Is conversant with the standard calibration method for weighing and measuring equipment's
- Is conversant with all safety systems available in the packaging plant
- Is conversant with MSDS of the product and its effect on exposure
- Can define the scope of work, award contract and manage the contractors to execute the activities
- Can operate and maintain all auxiliary and supportive equipment
- Is conversant with process control instruments used in the plant
- Understands the characteristics of the solid waste and effluents being generated in the plant, their treatment and disposal methods

Level 3-Developed

- Is fully conversant with the material handling equipment's used, their layout etc. to pack the product with minimum
- manpower and energy cost
- Is fully conversant with all the operations in packaging and can diagnose any malfunctioning in the process and
- suggest remedies
- Can develop fail-safe system for calibration and operation of packing unit
- Can guide in attending to any operational emergencies
- Can do trend analyses of process operating data to improve efficiencies
- Can diagnose the functioning of each equipment from the data and suggest modifications, repairs, cleaning etc. of the
- equipment during planned shutdown
- Can sort out any serious customer grievances with regards to packaging quality
- Can guide the project department in procurement / fabrication of the new equipment/components
- Can review and progressively improve operating procedures of every equipment
- Can develop training manuals for the personnel
- Can prepare SOPs for plant and machinery
- Is fully conversant with the PFD and PID and can recommend changes to improve the process
- Can suggest modifications / improvements on the safety, health and environmental issues pertaining to the section

Level 4-Organizational Steward

- Is fully conversant with the advanced technologies worldwide for packaging operations
- Can progressively recommend improvements in the equipment design and / or recommend replacement for improving the performance
- Can improve energy consumption, optimize manpower and increase automation
- Can recommend integration of any new system without affecting present operations
- Can recommend new packaging materials to meet Indian and international norms
- Can recommend automation in packing system to reduce errors, manpower and time cycle
- Is fully conversant with the cost-benefit analysis
- Is fully conversant with the international norms related to packaging
- Can proactively map changes in the environment / pollution policies/regulation to the equipment / processes/ materials in the section and also recommend appropriate changes
- Can recommend best practices used worldwide for packaging

Production Planning & Control

Description:

The combination of knowledge and skills required for carrying out the planning of production schedule, establishing sequence and lead time of each operation, to meet dispatch/delivery dates according to sales forecasts or customer orders for various products/intermediaries

Level 1-Novice

- Understands the process chemistry involved in the manufacturing processes of various products/intermediaries
- Is familiar with the physical and chemical characteristics of raw materials, in-process materials, finished goods,effluents and emissions of each production unit
- Is familiar with the operational features of mechanical and electrical equipment's and instrumentation
- Is aware of the basic maintenance practices such as preventive, routine, breakdown, annual maintenance, annual turnaround plan in terms of purpose and significance etc.
- Understands the relationships between the production plan, sales plan and overall business plan
- Is familiar with the engineering stores operations; storing, goods receipt & goods Issue
- Is familiar with the handling and storage operations of bulk material
- Is familiar with the ERP used for Production planning
- Is familiar with safety aspects related to manufacturing process
- Is familiar with 5S, TQM etc. and can assist in implementing such initiatives

Level 2-Practitioner

- Can draw up the production schedule in consultation with Production, listing out details related to all the resources such as, materials and machines, cost of materials, human resources, time required to complete the job and the quality standards to be met
- Can resolve complex issues, if any, related to production such as a shortage of staff or materials and machinery breakdowns
- Can investigate production problem, analyze root causes and suggest solutions to Production
- Can analyze back orders, current orders and upcoming orders to prioritize, plan and schedule the production operations
- Can assist in implementing technical changes in production lines
- Is able to adhere to company standards and production policies to meet company objectives
- Can analyze delays and interruptions and accordingly alter production schedule and expedite operations to meet deadlines
- Can prepare and maintain reports for production planning activities and sequences
- Can prepare list of required materials, tools and equipment for new product development

Level 3-Developed

- Is fully conversant with inventory management processes
- Can monitor production progress and ensure that final product meets quality standards and customer specifications
- Can coordinate with Production, Engineering, purchasing to achieve on-time delivery at optimum cost with optimum inventory levels
- Can recommend and plan technical changes in production lines
- Can establish and monitor ERP system parameters, including safety stock levels for finished goods and raw material inventories
- Can analyze all phases of WIP (work-in-process) and manage bottlenecks and capacity issues with the Production team and co-ordinate internally and externally the resolution of the issues
- Can evaluate production statistics and their impact to the production schedule
- Can recommend course correction action plans for managing variances as they arise
- Is fully conversant with stock reconciliation process
- Can effectively analyze if inventories need to be maintained, raised or lowered

Production Technology

Description:

This competency may be defined as the knowledge and skills required to manufacture the herbicides, insecticide, fungicides and other related products from starting raw materials and/or key intermediaries

Level 1-Novice

- Is familiar with the physical and chemical properties, form, type of packaging etc. of the chemicals, intermediates, solvents related to respective production areas
- Is familiar with the basic chemistry involved in the manufacturing process across various sections
- Is able to follow and understand Process Flow Diagrams (PFD) and Piping and Instrumentation Diagrams (PID) related to the manufacturing process
- Is aware of the characteristics of all the raw materials and utilities
- Is aware of the basic construction features of the major Plant and Machinery used in the manufacturing process
- Is able to follow Standard Operating Procedures (SOPs) indicated for plant operations
- Is aware of the key process parameters to be controlled/ monitored in the process
- Is familiar with the operating procedures of equipment's and for Scrubbing, Filtration, Evaporation, Crystallization, Drying & Stripping, Distillation etc.
- Is aware of the basic function of the Process Control & Instrumentation System
- Understands the mechanical, electrical and instrumentation maintenance issues associated with the operation of plant
- Is aware of the effluents/ wastes generated in the plant and their treatment and disposal methods
- Is aware of the packaging operations for various products
- Is familiar with the hazards associated with and the precautions to be taken while handling various chemicals used in the plant
- Understands the environmental issues / concerns associated with the process

Level 2-Practitioner

- Is conversant with the characteristics of raw materials, in-process materials, products utilities and packaging materials
- Understands the characteristics of the effluents and the permissible limits
- Is conversant with the basic construction features of the major Plant and Machinery used in the manufacturing process
- Is conversant with the process chemistry involved in the manufacture of the each of the products of the organization
- Can operate the plant effectively and efficiently by monitoring all the process parameters as mentioned in SOPs and using manual controls, automated instrumentation, SCADA etc.
- Is conversant with all the processes of the plant
- Can implement the initiatives of improving the characteristics of existing products/packaging
- Is conversant with the storing, packing and movement/ transport requirements of the materials handled / manufactured
- Can implement process and quality improvement initiatives like TPM, TQM, Kaizen, QCC etc.,
- Can effectively troubleshoot any typical problems that may arise during the operation
- Is conversant with the procedures of calibration of equipment and instruments as required
- Is conversant with statutory compliances and related documentation
- Is conversant with the hazards & risks associated with handling / storage of hazardous materials and can attend to emergencies
- Can suggest modifications / improvements on the safety, health and environmental issues pertaining to the plant
- Is conversant with the use of the proper PPEs and other safety items

Level 3-Developed

- Is fully conversant with PFD and PID and can recommend changes to improve the process
- Can plan, organize and direct all activities related to production
- Can sustain the plant parameters for safe and economic operation
- Can bring back into normality any abnormality observed in the plant/process
- Can periodically review plant performance, variances and take appropriate actions to achieve rated output
- Is able to carry out breakdown analyses of any equipment and suggest/recommend remedial methods to avoid such breakdowns
- Can do trend analyses of process operating data and various in-process analytical data to improve efficiencies
- Can diagnose the functioning of each equipment from the data and suggest modifications, repairs, etc. of the equipment during planned shutdowns
- Is fully conversant with the critical issues of production and can work towards finding a long-lasting solution
- Is able to provide inputs to equipment and process designers on critical aspects
- Can develop training manuals
- Is able to recommend appropriate automation to improve safety aspects and to optimize manual operations
- Can initiate methods for reducing effluent generation and/or reducing treatment costs by new technologies or finding alternate commercial usage for discharge streams
- Is able to identify major cost drivers and draw an action plan for reducing the same
- Is aware of the latest development in equipment designs
- Is able to scale-up plant and equipment for increased capacity

Level 4-Organizational Steward

- Has thorough knowledge of the PFD and PID and can make suitable suggestions or modifications so as to improve efficiency
- Can explore and select technologies, prepare PFD and Basic Engineering for plants
- Can provide technical inputs to engineering consultants
- Can provide guidance during trial run and commissioning of the plant and achieve the rated capacity and quality norms
- Can recommend best of technologies from those available globally
- Can scan, map and correlate best manufacturing practices, including establishment of benchmark metrics for various key performance indices
- Can proactively map changes in the environment/pollution policies/regulation to the equipment/processes/materials in the plant and also recommend appropriate changes
- Can recommend proper equipment to reduce energy consumption
- Can plan, organize and execute the start-up and commissioning activities of plant
- Can prepare Basic Engineering documentation for a new plant
- Can interact with detailed engineering consultants and provide technical inputs
- Can guide in developing on-site and offsite disaster management plans

Project Management

Description:

This competency may be defined as the combination of knowledge and skills required for conceptualizing, planning, basic and detailed engineering, procurement, inspection, erection, testing and commissioning to achieve successful project completion of installation of facilities required within the resources available

Level 1-Novice

- Is familiar with the basic content of feasibility study and basic engineering
- Is aware of the requirement and features of a Detailed Project Report
- Is aware of the principles, methods or project management tools for developing, scheduling, coordinating and managing projects and resources, including monitoring and inspecting costs, work and contractor performance
- Is aware of the process technologies involved in the project
- Can read and interpret engineering diagrams such as process flow diagram, fabrication and construction, piping and instrumentation drawings, electrical diagrams and schematics etc.
- Is familiar with the approximate cost of each equipment, materials & services required for the project
- Is aware of the resources available at site and those required to take up erection
- Is familiar with the machinery, tools and techniques used in the erection work
- Is aware of the characteristics, material strength properties and service applications for the construction materials used
- Is familiar with inspection methods to be carried out like stage inspection and final inspection for both equipment's and materials supplied and work executed at site
- Is able to understand the quality control parameters required for the projects
- Is conversant with the relevant national and international standards for engineering items
- Is familiar with the safety measures used as safeguards
- Is familiar with statutory compliances related to different agencies of the Government
- Is familiar with the inventory management at project site
- Is aware of the documentation required in execution of a project

Level 2-Practitioner

- Is able to understand the detailed engineering design
- Can prepare the specification of various engineering material that needs to be procured
- Can estimate the detailed cost of each equipment/work
- Can prepare a detailed list of equipment's and accessories required for the project
- Is conversant with the requirements and methodology of preparation of Techno-Economic Feasibility Report and Detailed Project Report
- Can prepare the vendor evaluation sheet
- Is conversant with contractual terms and scrutiny of offers
- Is able to identify the material to be procured from outside suppliers and get certain activities performed through contractors
- Is conversant with procedures of procurement, award of contracts etc., and legalities related to project items
- Knows the commercial aspects of procurement within India and imports
- Is able to manage the execution team / contractors to complete the erection within the approved time and cost and quality
- Is able to create as-built drawing
- Is conversant with project planning and monitoring tools and can operate independently
- Understands all the documentation related to project
- Is conversant with procedures of stage-wise/final inspection for equipment's, engineering materials, site works and final test procedures like no-load trial/load trial etc.
- Can take corrective / rectification measures wherever any discrepancies is observed
- Understands safe storage practices for every material
- Is conversant with the safety norms to be followed in project execution / commissioning
- Is conversant with the site conditions for executing projects
- Can interpret PFD and PID drawings
- Is conversant with the battery limits of the project and how to integrate different facilities, as required
- Is conversant with the basic engineering design document

Level 3-Developed

- Can formulate the specifications of a project and spell out the major components
- Is conversant with the national and international standards for construction and operation of various equipment's and components
- Can develop time, material and labour estimates for a project
- Is able to conduct feasibility studies/cost-benefit analysis of the project proposals
- Can establish the objectives of a project, translate them into targets and goals
- Can consider alternatives possible in executing a project to suggest the best option
- Can provide inputs in developing Detailed Project Report
- Can take remedial actions in case of any variance in time, cost and quality
- Is conversant with various types of equipment's and manufacturers available so as to choose the most appropriate equipment's and components
- Is fully conversant with the commercial aspects of domestic purchase and import
- Is able to choose a vendor at optimum cost and better quality in line with project requirement
- Is able to successfully implement contracts and recommend / take penal actions on contractors, wherever necessary
- Is able to review and modify the HAZOP, QRAs and design safety
- Can identify user friendly / more advanced and sophisticated documentation system / software for the project
- Is able to suggest methods for proper storage and retrieval of goods for minimum damage during storage
- Is familiar with possibilities of directly unloading of larger equipment at required place with appropriate heavy machinery and tools
- Is able to finalize contracts related to erection works
- Is able to define the management systems for tracking and control of the project management
- Can verify and approve the quantity and quality of work completed
- Can monitor and guide the trial run /commissioning of the project and suggest improvements wherever required to get desired end results

Level 4-Organizational Steward

- Can conceptualize a project and carry out feasibility study
- Can identify possibilities of improvement in the project already conceptualized and suggest improvements
- Is aware of the latest developments in project management tools and techniques
- Can identify competent vendors, contractors, consultants etc.. for projects
- Is able to coordinate with the technology provider and prepare PID & the basic engineering document
- Can guide in the preparation of Detailed Project Report
- Can select most suitable site from the options available and recommend it for execution of a project
- Is familiar with development in various capital goods including the material of construction and technologies/ system

Quality Assurance

Description:

This competency may be defined as the combination of knowledge and skills required for developing, evolving, directing and controlling implementation of Quality Management System based on the Quality Policy and Objectives laid down by the company so as to ensure production of final products/intermediaries as per desired specifications and customer's requirement

Level 1-Novice

- Is familiar with the analytical methods for determining various parameters
- Understands the process chemistry involved in the manufacturing processes of various products/intermediaries
- Is familiar with the physical and chemical characteristics of raw materials, in-process materials, finished goods, effluents and emissions of each production unit
- Is aware of the sampling techniques and equipment used
- Is aware of the sources which may contaminate the samples
- Understands the methods to store and handle chemicals safely
- Is familiar with personal protective equipment to be used while collecting samples at locations
- Understands sample identification and labeling procedures
- Is familiar with the common laboratory apparatus and glassware
- Is aware of the methods of weighing and the required accuracies
- Is familiar with standards and types of laboratory reagents, common acids and alkali solutions etc...
- Is familiar with Material Safety Data Sheets
- Is familiar with regular maintenance practices at plants
- Is familiar with personal protective equipment to be used while collecting samples at locations
- Is familiar with ERP and its application and associated documentation
- Is familiar with ISO concepts, procedures, their application and associated documentation

Level 2-Practitioner

- Can test current products / processes and identify deficiencies and suggest solutions
- Can investigate product quality and recommend improvements to achieve better customer satisfaction
- Can implement the overall Quality Planning strategy
- Can collaborate with the Product Development team
- Can oversee continuous improvement projects
- Can identify key KPIs for product quality
- Can estimate, prioritize, plan and coordinate quality testing activities
- Can verify and approve specifications / norms and standards of raw materials, in-process, intermediates and finished products / intermediaries, packaging material and labeling material
- Can prepare statistical data from the production lines to identify quality problems
- Is conversant with statutory / regulatory compliance procedures
- Can prepare equipment's / instruments in lab for periodic calibration
- Can carry out continuous improvement programs along with Production and Maintenance to improve productivity
- Can update Quality manuals periodically

Level 3-Developed

- Can initiate implementation of Quality Management System across the organization
- Can develop strategies for achieving quality objectives of the company relating to raw material / product quality, operations (process) quality etc.
- Can formulate guidelines and systems for implementing Quality Policy and objectives
- Can prepare, update and approve specifications / norms and standards of raw materials, in-process, intermediates and finished products / intermediaries, packaging material, labeling material and standard test procedures
- Can help suppliers to formulate quality standards for the goods they deliver
- Can set up, review and approve the Standard Operating Procedures (SOPs) for Quality Control and other inter-related functional departments
- Can identify, select equipment's / instruments for, analytical lab
- Can review/analyze statistical data from the production lines to identify quality problems and recommend changes to production processes or quality control to eliminate the problem
- Can carry out filing of common technical documents to regulatory authorities
- Is fully conversant with statutory compliance norms/ good manufacturing practices
- Is fully conversant with calibration of various types of equipment's/instruments in lab
- Is fully conversant with customer audits / regulatory inspections (international / national authorities)
- Can develop and monitor continuous improvement programs, aiming to reduce the number of defects and improve levels of quality

Level 4-Organizational Steward

- Is aware of the changes worldwide in the field of quality management
- Is aware of the changing requirements of the customer and can recommend improvements in the process and product characteristics
- Is able to set up and develop analytical lab for a new plant
- Can recommend advanced equipment and instrument for use in the lab
- Can develop a quality management plan for a manufacturing company

Quality Control

Description:

This competency may be defined as the combination of knowledge and skills required for carrying out physical and chemical analysis to monitor the quality parameters so as to ensure production of final products/intermediaries as per desired specifications and customer's requirement D

Level 1-Novice

- Is familiar with analytical methods such as acid-base, complexometry, gravimetry, Spectro-photometry, separations and Instrumental Analysis
- Is familiar with the chemistry related to various analytical methods for determining various parameters
- Understands the process chemistry involved in the manufacturing processes of various products/intermediaries
- Is familiar with the physical and chemical characteristics of raw materials, in-process materials, finished goods, effluents and emissions of each production unit
- Is aware of the appropriate sample locations of different plants
- Is aware of the sampling techniques and equipment used for the same
- Is aware of the sources which may contaminate the samples
- Understands the methods to store and handle chemicals safely
- Is familiar with personal protective equipment to be used while collecting samples at locations
- Understands sample identification and labeling procedures
- Is familiar with the common laboratory apparatus and glassware
- Is aware of the methods of weighing and the required accuracies
- Is familiar with standards and types of laboratory reagents, common acids and alkali solutions etc.
- Is familiar with Material Safety Data Sheets
- Is familiar with ISO concepts, procedures, their application and associated documentation
- Is familiar with ERP and its application and associated documentation

Level 2-Practitioner

- Is conversant with analytical chemistry, process standards, testing and inspection laid out for raw material, in-process material, finished products, effluents, emissions, packaging products etc.
- Is able to operate lab equipment / instruments and attend to the preventive maintenance and troubleshooting
- Is conversant with BIS standards relevant to the industry
- Can perform calculations related to the analysis carried out
- Understands standards of reagent purity and can prepare them for use in analytical works
- Can select proper method for testing different parameters
- Understands analytical method limitations wherever applicable
- Is able to prepare samples for analysis, analyze them and interpret results
- Is conversant with documentation of all the analysis carried out
- Is conversant with calibration and checking of lab instruments
- Is able to optimize lab equipment and instruments for effective utilization
- Is able to recognize abnormal analytical results and determine appropriate corrective action
- Can maintain inventory and optimize consumption of chemicals and reagents
- Is able to take appropriate action for disposal of expired and excess reagents and chemicals
- Is able to maintain Material Safety Data Sheet files
- Is conversant with segregation of chemicals based upon their compatibility
- Is conversant with safety aspects related to lab operations
- Is familiar with 5S, TQM etc. and can assist in implementing such initiatives

Level 3-Developed

- Is fully conversant with the specifications of lab equipment's and instruments
- Can train staff on lab techniques, analytical methods and use of advanced equipment's and instruments
- Is able to maintain regulatory compliance related to processes carried out
- Is able to develop Standard Operating Procedures (SOPs) for the analytical lab
- Can organize and plan analytical activities related to different plants
- Can establish documentation related to analytical works of all the plants
- Can evaluate and interpret data related to analysis
- Can review and monitor the activities carried out in lab and take corrective actions in case of deviations
- Has thorough knowledge of the safety regulations, procedures and emergency plan related to chemical lab
- Can select appropriate personal protective equipment and other safety equipment's for the lab
- Can prepare and update specification norms for raw materials, in-process material, packaging material, finished products etc.
- Can provide responses to customer complaints on finished products
- Can conduct laboratory investigations for detailed troubleshooting of chemical applications
- Is able to identify and initiate automation in laboratory
- Can provide technical inputs to production in preparing the documentation for product license applications, HACCP aspects etc.

Level 4-Organizational Steward

- Is aware of the changes worldwide in technologies related to the products manufactured
- Is aware of the changing requirements of the customer and can recommend improvements in the process and product characteristics
- Is able to set up and develop analytical lab for a new plant
- Can recommend advanced equipment and instrument for use in the lab

Research & Development

Description:

The combination of knowledge and skills required for determining the best equipment and process conditions in which the yields can be maximized and to increase the profitability of existing products / key intermediaries / develop new products

Level 1-Novice

- Can read and understand process flow sheet, equipment layout, plant layout, Process Instrumentation & Control Diagram
- Is aware of the design specifications to be considered for a chemical processing flow-path / stream in the selection of the technology and required equipment's / components etc.
- Is familiar with the physical and chemical characteristics of raw materials, in-process materials, finished goods, effluents and emissions of each production unit
- Is familiar with the sourcing and storage of raw materials, intermediates, solvents etc. for producing different products
- Is familiar with the chemistry and production processes of various products
- Is aware of the requirement and availability of utility systems such as water, power, steam, cooling water etc. for producing various products
- Is familiar with the consumption norms of utilities and the yields for specific products as per design and rated capacity
- Knows the quantity and quality of all effluent/ by-products stream
- Is aware of the safety precautions as stipulated for each chemical used in the plant
- Is familiar with the documentation related to the process of producing various products and the analytical reports generated at laboratory
- Is aware of the key process parameters used in the trend analysis of process
- Can identify the areas where process can be improved

Level 2-Practitioner

- Understands detailed physical and chemical specifications and properties of all the chemicals handled at the plant
- Is conversant with the best conditions to be maintained with respect to pressure, temperature, pH etc. for optimum yields
- Understands the principle of operation of different types of equipment's
- Is able to collect, collate, compute and analyze operating data, utility consumption details and quality parameters and suggest measures for improvements in plant operation
- Is conversant with the conditions which may affect a particular reaction and can suggest steps to prevent them
- Is able to decide on the process selection / application for different processes
- Is acquainted with the hazardous nature of the chemicals and the mixtures to take necessary precautions while charging, discharging, pumping and transfer
- Can suggest changes in design specifications to be considered for a chemical processing flow-path/stream for the selection of equipment's
- Can specify types of process instrumentation needed to measure chemical process parameters
- Can identify the bottlenecks in processes, products packing and other services and suggest solutions for troubleshooting
- Can prepare proposals of energy savings and its optimal use together with their economic evaluation
- Is able to carry out bench-level experiment to confirm that improvement can be done
- Can provide inputs to scale-up basic process data to commercial plant level

Level 3-Developed

- Can identify the potential areas of improvement to optimize the product cost or improve quality or throughput to get the better market share for the product
- Can evaluate new and modified process/equipment/layout etc. and recommend required changes
- Carries out experiment by varying raw material quality / quantity and process condition to either reduce the effluent or increase value of the effluent
- Can incorporate newer processes employing lesser number of steps of reaction, low energy volumes and cheaper/environment-friendly energy sources
- Can bring back into normality any abnormal reaction observed in the plant
- Can progressively evolve usage of non-hazardous materials and processes
- Is aware of the latest development in equipment designs to perform a given unit operation or process with much ease in operation and less motive power
- Is fully conversant with the factors governing the design of particular equipment to modulate the operating parameters
- to achieve the same/improved yields at different capacity utilization
- Is fully conversant with the various spent streams of vapours, liquids and solids to suggest recovery methods to optimize the raw material consumption
- Is fully conversant with the hazardous nature of various chemicals / intermediates used in the plant to design improved safety precautions for operation, handling, spillage, leakage etc.
- Is able to scale-up plant and equipment for increased capacity
- Can undertake market analysis of potential gaps and identify new areas for growth for the business

Level 4-Organizational Steward

- Is aware of the changes in related technologies worldwide
- Can evaluate a project strategically and identify the most appropriate technology
- Can recommend suitable actions on any kind of reactions to achieve optimum conditions/ desired objectives
- Is fully conversant with the rate controlling mechanisms of a reaction and can decide upon the process conditions /steps etc.
- Can use HAZOPS and fault-tree analyses in process design
- Understands environmental constraints and can incorporate these into process synthesis
- Can provide inputs to the management with respect to the trends, market share, growth potential and competitor performance and strategy
- Can give inputs to develop financial and strategic plans for new product concepts
- Scans global best practices for equipment and process monitoring and maps scope for their implementation in the organization
- Is fully conversant with the present end-uses of the product and try to find more uses in other industry to increase the market share

Safety, Health & Environment

Description:

The set of knowledge elements which enables one to understand and adopt appropriate steps for adhering to / maintaining aspects related to safety, occupational health and environment during manufacture of products / key intermediaries

Level 1-Novice

- Is aware of the organizational policy and objectives related to SHE
- Understands the various critical aspects in the manufacture of various products which have a bearing on safety and health of the worker
- Is aware of the hazards & risks associated with handling of hazardous materials used in the plant
- Is aware of precautions / permit systems to be used in the plant while attending to any maintenance work on the equipment handling hazardous material
- Is aware of the routine documentation and also special documentation and reporting
- Is aware of safe practices initiative such as 5 S
- Is aware of the various legal matters pertaining to worker health and safety
- Is aware of the available PPEs and their application / SOPs in various operations
- Is aware of all the fire and safety equipment, checklist for their upkeep & their usage for specific activities
- Is familiar with the Disaster Management Plan prepared for the storage facility/handling of various chemicals and solvents
- Knows about the need and types of Mock Drill, Fire Drill, Table Top Drill
- Is aware of the requirement of pollution control, waste management, recycling, environmental health, conservation and renewable energy
- Is aware of the requirement of stipulated man-days training per person, training material and the schedule

Level 2-Practitioner

- Is conversant with the critical aspects during production of various products and utilities which have a bearing on SHE
- Is conversant with the safety objectives of the company - in terms of the statutory regulation enforcement methods, precautionary steps and emergency procedures
- Is conversant with the hazards & risks associated with handling / storage of hazardous materials and can attend to emergencies
- Can plan and conduct mock drills / exercises
- Is conversant with the routine and special documentation to be prepared in aspects pertaining to SHE, its enforcement and reporting
- Can implement safe practices initiatives such as 5 S
- Has wide knowledge of the various aspects which impact the health of the worker
- Is conversant with the various statutes pertaining to worker health and safety
- Is able to implement and monitor the systems & Procedures related to Safety /occupational health
- Is able to ensure quality / availability and replacement of PPEs as per the schedule
- Ensures compliances and responds to queries raised by the regulatory authorities
- Can implement environmental strategies and action plans, to ensure corporate sustainable development
- Can carry out process safety audits
- Can coordinate all aspects of pollution control, waste management, recycling, environmental health, conservation and renewable energy
- Is conversant with the concepts of risk management, identification of the risks and the mitigation methods

Level 3-Developed

- Is conversant with national and international norms related to SHE
- Is able to guide the personnel in the compliance of applicable statutory standards and procedures
- Is fully conversant with setting up safety systems for handling and storage of hazardous chemicals
- Can ensure that all accidents are documented, investigated and recommended improvements implemented
- Can conduct risk rating for any activity planned in the plant
- Is able to develop and update the Safety guidelines, systems and procedures
- Can conduct safety audits and recommend appropriate measures for enhanced safety standards
- Can carry out audit, analyze and report environmental performance to internal and external clients and regulatory bodies
- Can give technical inputs in risk identification and suggest mitigation methods
- Can formulate training programs to achieve best safety norms in the related sector
- Can interact with the statutory bodies and guide in complying with necessary documentation and norms
- Is fully conversant with the latest developments / new PPEs / Fire and Safety equipment availabilities and is able to select appropriate ones for the plant
- Can establish/develop structured programs of health & safety training throughout the Company
- Can guide in preparation of Disaster Management Plan for the plant
- Can set organizational sustainability targets related to environment and develop plans to meet those targets and oversee their delivery

Level 4-Organizational Steward

- Is able to develop new techniques in measuring standards and performance for safety, occupational health and environment
- Can design systems and procedures for the plant for SHE
- Can recommend measures to ensure norms at selection of technology stage / design of equipment and plant
- Can recommend the need to make changes in statutory regulation based on technological advances
- Can impart knowledge on SHE to various stakeholders in the industry
- Can promote and raise awareness, at all levels of an organization, of the impact of emerging environmental issues

Spare Parts Planning

Description:

This competency may be defined as the combination of knowledge and skills which enables organization to continuously optimize the spares inventory while providing the required service levels (availability) at the optimum costs through better planning, forecasting, streamlining policies and processes of the Spare Parts Management

Level 1-Novice

- Has basic understanding of the Spare Parts Management system and the processes involved
- Understands basic stores operations; Layout, Storing methods, Goods receipt & Goods Issue
- Is aware of the material codification system followed
- Can assign part numbers using the existing codification system, updating the source documents and also maintaining the engineering change note control
- Is familiar with the equipment's and accessories used in the plant
- Is familiar with all the engineering standards
- Is aware of the spare parts purchasing process from purchase requisitions to goods receipts
- Is familiar with the inventory concepts and inventory control systems and control tools like ABC analysis, VED analysis
- Is aware of the importance of the physical inventory accuracy
- Is familiar with the physical and chemical characteristics of raw materials, in-process materials, finished goods, effluents and emissions of each production unit
- Is aware of the process involved in the manufacturing of various products / intermediaries
- Can read and interpret engineering diagrams
- Is familiar with the approximate cost of each equipment, materials & services required for the project
- Is familiar with ERP and its application and associated documentation
- Is familiar with 5S, TQM etc. and can assist in implementing such initiatives

Level 2-Practitioner

- Can monitor trends and gather all relevant information to enable better forecasting and demand planning of the spares
- Is able to continuously monitor the availability of spares and take appropriate steps to reduce the stock-outs
- Is conversant with the purchasing procedures, policies and is able to identify suppliers, negotiate and ensure spare availability as per the demand plan
- Is able to streamline all transactions related to purchase, inventory management, warehouse management and accounts payables for the vendors
- Is able to assist the Production Planning & Control in generating the maintenance plans and provides critical inputs in terms of spares availability, planned due dates etc.
- Is able to monitor the quality of incoming spares and plan appropriate actions/strategies to reduce the quality issues with the vendors
- Can evaluate vendor, set norms and parameters for evaluation and also monitor the performance and take appropriate actions
- Is able to standardize the codification system, engineering change control system, parts location etc.
- Can perform a VED and ABC analysis and adopt specific strategies for all categories of spares to reduce the inventory risks and costs
- Can assimilate the spares requirements of annual turnaround and plan the availability of spares

Level 3-Developed

- Is able to generate the demand plan of spare inventories in a scientific manner using the MTBF, asset usage levels, planned maintenance, and vendor returns to ensure the assets are serviced in the best possible manner
- Is able to design service levels for spare parts availability after taking into consideration the trade-off in the service level -cost model, logistics delay time etc.
- Can apply tools and models to design the inventory norms and policies, safety stocks, reorder points, stock outs etc.
- Can carry out a FMEA (Failure Mode and Effects Analysis) for critical spares and plans corrective and control activities
- Is able to build an indigenous supplier network to reduce the overall costs and also provide critical inputs and support to vendors in indigenizing the spares
- Understands the trade-off between repair and replacement and frames guideline for the department in the above context
- Is able to design Quality Management System and Procedures for ensuring the quality, cost and performance of the sub-contracted jobs meet the service expectations
- Can carry out reliability assessment of critical spares
- Is able to form service level agreements with key suppliers and monitor their performance on a regular basis
- Is able to standardize the pricing procedures for procurement of spares and streamline the pricing in special cases such as job work, consignment stock etc.

Level 4-Organizational Steward

- Understands the impact of spares inventory on the inventory turnover measure for the plant / company and can frame strategies/policies to optimize the spares inventory
- Can develop annual spares budget based on past performance and historical data
- Can negotiate/form alliance and partnerships with key vendors and identify methods to reduce the overall spares costs for the plant / company
- Is able to benchmark the trade-off between availability and costs of spares and initiate specific strategies to reduce the costs
- Understands the Total Cost of Ownership (TCO) concept and is able to institutionalize and integrate it in the pricing procedure
- Is aware of the emerging trends in the area of spare parts management systems and is able to implement these systems to optimize the spare parts inventories and spare parts costs
- Is able to reduce the forecast variation in the demand plans and build robust demand planning process for spares
- Is able to design processes to build/enhance the inventory visibility for spare parts across the sections/plants
- Is able to optimize the 'safety stock' inventory based on the lead times, historical data
- Can design time-based replenishment policies for items in terms of re-order points and quantities
- Is able to streamline Spare Parts Management system and also eliminate inconsistencies in the systems
- Is able to offer solutions to automate the spare parts management related processes and procedures

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