

Name and address of awarding body: Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Head Office, Guindy, Chennai

Name and contact details of individual dealing with the submission

Prof. (Dr.) S. K Nayak, Director General, CIPET, CIPET Head office, Guindy, Chennai

Ph: +91-44-22253040, +91-44-22254780

E-mail address: bdccipet@gmail.com, cipethq@vsnl.com, drsknayak@cipet.gov.in

List of documents submitted in support of the Qualification File:

1. Qualification Document – Chemical Effluent Treatment Plant Operator
2. Curriculum/ Syllabus
3. Criteria for Assessment of Trainees
5. Occupational Map
6. Documents supporting need of the Qualification:
 - a. Annual Report 2016-17
 - b. A Report on Human Resource and Skill requirement for the Chemicals and Pharmaceutical sector (2022) by NSDC.
 - c. Brief report of Chemicals and petrochemicals Industry in India, April 2015, Corporate Catalyst India Pvt Ltd, Page 4
 - d. Industry Engagement certificate in preparation of learning outcomes and Job Role identification in Petrochemicals sector

QUALIFICATION FILE
SUMMARY

Qualification Title: Chemical Effluent Treatment Plant Operator

Nature and Purpose of the qualification:

A CIPET trade certificate for chemical effluent treatment plant operator is work with equipment to remove potentially harmful industrial, agricultural, and domestic contaminants from wastewater before it is returned to the environment or recycled. The chemical effluent treatment plant operator will be able to ensure that water used for domestic and commercial purposes is safe for drinking and beneficial for the environment.

Body/bodies which will award the qualification:

The Academic Cell – HO, Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Head Office, Guindy, Chennai.

Body which will accredit providers to offer courses leading to the qualification:

The Academic Cell – HO, Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Head Office, Guindy, Chennai.

Body/bodies which will be responsible for assessment:

The assessment is being carried out at individual Centre level. Training Assessment Wing in Head Office (HO) of Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Guindy, Chennai is responsible for overall assessment.

Occupation(s) to which the qualification gives access:

Chemical Effluent Treatment Plant Operator occupation in chemical manufacturing process

Proposed level of the qualification in the NSQF: Level 4

Anticipated volume of training/learning required to complete the qualification:

960 Notional hours.

Entry requirements / recommendations:

Minimum qualification – Diploma in Chemical Engineering/ B.Sc. Degree with Environmental studies as one of the subject, Minimum age - 18 years completed.

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Progression from the qualification: Chemical Effluent Treatment Plant Operator will become the Supervisor in the Chemical Manufacturing Plant.			
Planned arrangements for the Recognition of Prior learning (RPL): RPL arrangements are being developed and will be informed in due course of time.			
International comparability where known: It will be carried out in next phase as comparability is being verified. Date of planned review of Qualification: 30.04.2020			
Format Structure of the Qualification:			
Title and Identification code of component	Mandatory/ Optional	Estimated Size (Notional Hours)	Level
CPC/N9404: To practice & maintain safe and good work environment	M	92	4
CPC/N9405: Controlled operation of equipment and monitor operating conditions	M	744	4
CPC/N9406: Understanding of Standard Methods for Water and Wastewater Laboratory Analysis	M	124	4
Total		960	

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SECTION1

ASSESSMENT

Body/Bodies which will carry out assessment:

A Separate department/ body -Training Assessment Wing of Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Head Office, Guindy, Chennai.

Will the assessment body be responsible for RPL assessment?

RPL arrangements are being developed and will be informed in due course of time.

Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, consistent and fair and show that these are in line with the requirements of the NSQF:

With uniformity and setting of learning outcomes for different Jobs Roles the assessment of candidates will be at learning outcome level. Assessment criterion has been defined for each learning outcome and it includes both theoretical and practical skills on which the candidate will be assessed. The question suite which will be used to check the skills of the trainee would include

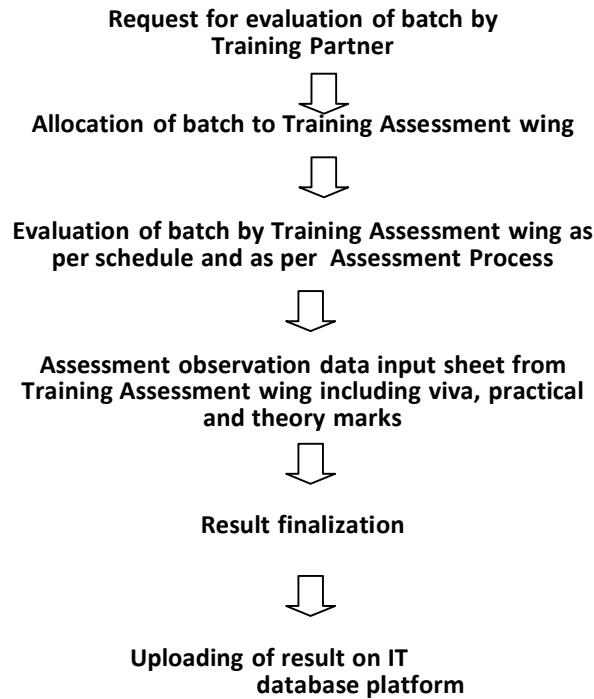
- **Theoretical test suite** – Will include multiple choice questions, audio-video question etc. which will test the trainee on his knowledge of the subject
- **Practical Knowledge suite** – Practical knowledge can be tested through Assessor driven evaluation/test, Situational Judgment Tests etc to test practical core competence. A mix of these would be able to evaluate the trainee on his practical knowledge of the Qualification Document.

Assessment strategy:

- Assessment criteria for Qualification Document have been developed. Each Learning Outcome have separate marks for Theory and Practical Skills.
- The Training Assessment Wing will have assessors who will not be associated with training activities and will be provided training on the said work. Thus it will ensure that the assessment carried out is fair and consistent.
- Set of question bank developed to assess the theoretical and practical knowledge. To ensure the quality, each trainees get the unique set of question.
- Student has to score minimum marks separately for theoretical and practical skill and overall percentage should also be 50% for theory and 70% for practical.
- Empanelment of subject matter expert as assessor to assess trainee specifically on practical skills.
- Assessments are preferably conducted by written examination papers in English/regional languages according to the requirement.
- It has been ensure that TP/trainer should not be present during assessment

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Assessment Process Flow:



Summative Assessment:

Based on the Total Marks allotted for the specific subject, formal evaluation shall be conducted. Based on secured marks, candidates shall be declared pass or fail.

Steps undertaken for summative assessment:

1. Based on Completion of Batch, Evaluation Schedule shall be prepared
2. Identified Assessor is nominated for Evaluation
3. Setting up of separate Question Paper for Theory & Practical Examination
4. Conduct of examination as per the schedule
5. Evaluation & Certification

Evidence Collected during Assessment: Theoretical Answer Sheets, Practical Exam Sheets, Evaluation Sheets, Jobs produced during practical Exams.

Protocol for Selection of Assessors:

The Assessors should have the minimum qualification: Degree in Science/Engineering.
The Assessors should have minimum 5 years of Experience in the relevant field.

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ASSESSMENT EVIDENCE

1. Criteria for assessment for each Qualification Document will be created by CIPET.
2. Each Assessable outcome (AO) will be assigned marks proportional to its importance in Learning Outcome and few performance criteria may be allotted marks in combine.
3. Each Learning Outcome will be assessed both for theoretical knowledge and practical which is being proportionately demonstrated in the table below.
4. The assessment for the theory part will be based on knowledge bank of questions created by CIPET which will contain multiple choice theory questions and Practical question database with mark allotment criteria.
5. To pass the Qualification Document, every trainee should score a minimum of 50% in Functional and all Generic Learning Outcome's.
6. In case of successfully passing only certain number of Learning Outcome's, the trainee is eligible to take Subsequent assessment on the balance Learning Outcome's to pass the Qualification Document.

Title of the Component: Chemical Effluent Treatment Plant Operator

Assessable outcome		Assessment criteria for the outcome		
LO	Assessable outcome Description	Theory	Practical	Total
1. CPC/N9405: Controlled operation of equipment and monitor operating conditions	AO1. Discuss the work order (work output) required from the process and with the supervisor	1	5	6
	AO2. Refer all components/process related documents to understand dimensions and properties of the required work output	1	5	6
	AO3. comprehend the process and chemical equipments required for the process	2	5	7
	AO4. Clearly understanding the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by supervisors	1	5	6
	AO5. Operate and adjust equipment controls to purify and clarify water	1	8	9
	AO6. Inspect equipment and monitor operating conditions, meters, and gauges to determine load requirements	2	8	10
	AO7. Record operational and laboratory data, observations of processes, and meter and gauge readings on specified forms	2	4	6
	AO8. Ensure the availability of spare parts for continuous operation of machine	2	10	12
	AO9. Ensure that instruments machines parts & no foreign material is entrapped in parts of mould/die.	2	10	12
	AO10. Ensure cleaning of the other machine tools, auxiliaries (if any)	3	10	13

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	AO11. Ensure cleaning of the area around the machine for any oil, grease, water etc	3	10	13
	AO12. Consult with superiors in case of any doubt/clarification	4	0	4
	AO13. Develop self-confidence after resolving the queries to complete	3	0	3
	AO15. Report completion of work to superiors	3	0	3
	AO16. Develop good interpersonal relations with superiors & fellow	4	0	4
	AO17. Ensure disciplined behavior in work place	3	0	3
	AO18. Develop good coordination with other department person for getting their support for work.	3	0	3
	Sub total	40	80	120
2. CPC/N9406 : Understanding of Standard Methods for Water and Wastewater Laboratory Analysis	AO1. Collect and test water and wastewater samples	10	30	40
	AO2. Evaluate Total coliform / E.coli sampling from each source of supply	5	30	35
	AO3. Ensure Chlorine residual to be measured and recorded at representative points in distribution system	5	30	35
	AO4. Knowhow about the Effluent and Influent	5	30	35
	AO5. Evaluate Total Suspended Solids (TSS)	5	30	35
	AO6. Knowhow about the wastewater Chemistry	5	30	35
	AO7. Report the problems caused by machines to superior, when not resolved by operator.	3	5	8
	AO8. Report major processing defects beyond control of operator	2	5	7
	AO9. Keep records of machine log book, data sheet of machine parameter	3	5	8
	AO10. Maintain Documents related to incoming & outgoing material	2	5	7
	AO11. Meet targets & goals for production	2	4	6
	AO12. Minimize defects in final product	2	4	6
	AO13. Follow quality system to get better product	2	4	6
	AO14. Keep work area clean & systematic	2	4	6
	AO15. Comply to safety & health guidelines & rules	2	4	6
	Sub total	55	220	275

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3. CPC/N9404: To practice & maintain safe and good work environment	AO1. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise	1	4	5
	AO2. Identify areas in the plant which are potentially hazardous/unhygienic in nature	1	4	5
	AO3. Conduct regular checks with support of the maintenance team on machine health to identify potential hazards due to wear and tear of machine	2	4	6
	AO4. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc.	2	4	6
	AO5. Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations	2	4	6
	AO6. Create awareness amongst other by sharing information on the identified risks	2	4	6
	AO7. Support the Safety team and the supervisor in creating the risk mitigation plan	2	4	6
	AO8. Plan for Minimum wastage & its safe disposal	2	4	6
	AO9. Work in conformance to legal requirements, organizational policies and procedures	2	4	6
	AO10. Ensure that the mould is ready & having no problem in dry run	2	4	6
	AO11. Check material is available for production. If required Arrange for pre drying	2	4	6
	AO12. Check the availability & readiness of ancillary Equipments	2	4	6
	AO13. Load the material (if required) in the hopper	2	4	6
	AO14. Set the parameters of the machine i.e temperature, pressure, speed etc	2	4	6
	AO15. Check the temperature on the barrel with respect to Set temperature	2	4	6
	AO16. Conduct trial run to gets ample piece once machine is set	2	4	6
	AO17. Adjust parameters unless getting final product	2	4	6
	AO18. Visual check of final product	2	4	6
	AO19. Define accepted products and defective products as per approved plan	2	4	6
	AO20. Carry out post molding operation during the cycle time run such as. trimming, apply protective tapes, putting labels on each product for identification	1	4	5
	AO21. Store the final product in specified area	1	4	5
	AO22. Clean the machine & equipments at regular interval	1	4	5
	AO23. Work in compliance with specified health and safety standards	1	4	5
	AO24. Ensure preventive maintenance of machines & ancillary equipments	1	4	5

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	AO25.Develop coordination with maintenance department for resolving breakdown maintenance in minimum possible	1	4	5
	AO26.Ensure Root cause analysis of moulding defects	1	4	5
	AO27. Carry out Analysis of data sheets available in	1	4	5
	AO28.Take all corrective & preventive action	1	4	5
	AO29.Report the problems caused by machines to Superior, when not resolved by operator.	1	4	5
	AO30.Report defects in the moulds that one do not have the Authority to repair	1	4	5
	AO31.Report major processing defects beyond control of operator	1	4	5
	AO32.Keep records of machine log book, datasheet of Machine parameter	1	4	5
	AO33. Maintain documents related to incoming & outgoing	1	4	5
	AO34.Meet targets& goals for production	1	4	5
	AO35.Minimize defects in final product	1	4	5
	AO36. Follow quality system to get better product	1	4	5
	AO37.Keep work area clean & systematic	1	3	4
	AO38.Comply to safety & health guidelines & rules	1	3	4
	Sub total	55	150	205
	Total	150	450	600
Means of assessment 1:				
The assessment comprise of -				
Theory Assessment				
Viva voice				
Practical assessment				
Means of assessment 2:				
Pass/Fail-				
The Pass mark of theory written assessment is 50% and for viva and practical assessment is 70%. The candidate has to pass separately in Theory and Practical.				

QUALIFICATION FILE

SECTION2

EVIDENCE OF LEVEL

Level of qualification: 4

Title /Name of Qualification/Component: Chemical Effluent Treatment Plant Operator Level: 4			
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF Level descriptors	NSQF Level
Process	<p>Chemical Effluent Treatment Plant Operator ^[SEP] he/she has to-</p> <ul style="list-style-type: none"> • Understanding the work order and the process requirement from the supervisor • To interact with the supervisor in order to understand the production schedule • To plan the day's production activities based on the supervisor's instructions • To collect material data sheet, machine instructions and work manuals • To ensure availability of consumables and plastics materials for production in sufficient quantity as per production plan/supervisor instructions. • Clearly understanding the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by supervisors. • Check availability of the personal protective equipment's (PPE) like Gloves, Goggles etc. • Ensure that the required material is procured from the store before starting the process 	<p>Chemical Effluent Treatment Plant Operator - requires limited range of activities which are familiar and predictable like availability of consumables, safety PPE, raw material used, basic machine parts and its functions etc.</p> <p>He should understand Inspect equipment and monitor operating conditions, meters, and gauges to determine load requirements and detect malfunctions which justifies the pegging of level 4.</p>	4

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	<ul style="list-style-type: none">• Add the raw material in the machine using material loader or by manual feeding.• Ensure cleaning of the area around the apparatus for any oil, grease, combustible substances etc. so as to prevent any accident• Ensure availability of the coolant and working of valves to circulate the coolant to cool and solidify plastic• Refer the queries to supervisor if they cannot be resolved by the operator• Confirm self - understanding to the supervisor once the query is resolved so that all doubts & queries can be resolved before the actual process execution• He is responsible for checking the operations of the equipment• Perform visual inspection of the output products• Achieve productivity, quality and safety standards as per company's norms• Report problems to supervisor• He will be responsible for Inspecting the finished components conducting minor repair/de-flashing if any on output parts which can be reworked• The role holder will interact with maintenance team and material management team• The individual needs to ensure sorting, streamlining & organizing, storage and documentation, cleaning, standardization and sustenance across the plant and office premises of the organization		
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	<ul style="list-style-type: none"> • He needs to understand Market Information Management • Client Relation Management • Marketing knowhow and strategy • He also needs to understand and practice Entering, update and maintain data in MS Office system/ Office open source system. 		
Professional knowledge	<p>The user/individual on the job needs to know and understand:</p> <ul style="list-style-type: none"> • Basic knowledge of microorganisms used in wastewater treatment like Anaerobic Digestion and Activated Sludge. • Basic knowledge of plant and animal organisms, their tissues, cells, functions, interdependencies, and interactions with each other and the environment. • Basic knowledge of the chemical composition, structure, and properties of substances and of the chemical processes and transformations that they undergo. This includes uses of chemicals and their interaction, danger signs, production techniques, and disposal methods. • Knowledge of hydraulics, flow dynamics, electricity and head pressure. 	Chemical Effluent Treatment Plant Operator should know factual knowledge of Microbiology, Biology and Chemistry and Physics which justifies the pegging of level 4.	4
Professional skill	<p>The user/individual on the job needs to know and understand:</p> <ul style="list-style-type: none"> • General principles of plastics processing, Knowledge Understand the operation and control process and Operation of Different types of Equipment 	Chemical Effluent Treatment Plant Operator should know about Operation, control, and maintenance of electric motors, valves, pumps, chemical feeding devices, and mixers	4

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	<ul style="list-style-type: none"> • Hazards and safety aspects involved in tape production and usage of relevant PPEs • Safety procedures to be adopted to complete die removal process • Detect problems in day to day tasks: Support operator in using specific problem solving techniques and detailing out the problems • Discuss possible solution with the supervisor for problem solving. <p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> • Plan and organize the work order and jobs received from the internal customers/ operator. • Organize all process/ equipment manuals so that sorting out <p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> • Follow instructions and work on areas of improvement identified • Complete the assigned tasks with minimum supervision • Complete the job defined by the operator within the timelines and quality. • The user/individual on the job needs to know and understand how to: • Use common sense and make judgments during day to day basis • Use basic reasoning skills to identify and resolve basic problems • Use intuition to detect any potential problems which could arise during operations. • He needs to know about entrepreneurship associated with plastics extrusion, its concepts etc. He needs to know about marketing strategy involved for the products manufactured, market availability etc. 	<p>Chemical Effluent Treatment Plant Operator should be able to Operate and monitor process units treating the solids removed from wastewater as well as the foul air generated from treatment.</p> <p>Chemical Effluent Treatment Plant Operator should Daily reading and logging of meters, gauges, and indicators which justifies the pegging of level 4.</p>	
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Core skill	<p>The user/ individual on the job needs to know and understand how to:</p> <p>How to be able to read warnings, instructions and other text material on product labels, components etc</p> <p>How to enter into the history card details of the fault identified in the plastic product manufactured read equipment manuals and process documents to understand the equipment and processes better.</p> <p>Read instructions especially safety instructions especially symbols while using the equipment in the plant area logs.</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>Discuss task lists, schedules, and work-loads with co-workers/assistants and supervisors</p> <p>Question internal customers/ Shop floor operator appropriately in order to understand the nature of the problem and make a diagnosis</p> <p>Avoid using jargon, slang or acronyms when communicating with a operator /fellow subordinates etc. Unless it is required.</p>	Chemical Effluent Treatment Plant Operator should be able to read /write warnings, instructions and other text material on product labels, components etc with minimum required clarity, should have skill of basic arithmetic, like raw material weights additions etc. which justifies the pegging of level 4.	4
Responsibility	The chemical effluent treatment plant operator should have basic knowledge of the materials, tools, and methods used in general construction, repair, maintenance and operation of treatment plants and related pump stations; knowledge of elementary chemistry and biology; knowledge of the operation and maintenance of motors, pumps, and related equipment learn to perform laboratory tests, maintain records and take readings of gauges and meters, with minimum supervision.	The chemical effluent treatment plant operator will be able to ensure that water used for domestic and commercial purposes is safe for drinking and beneficial for the environment which justifies the pegging of level 4.	4

QUALIFICATION FILE

SECTION3

EVIDENCE OF NEED

What evidence is there that the qualification is needed?

Qualification document has been developed by suggestion and approval of Chemicals and Petrochemicals Core committee constituted by Department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilizers, Govt. Of India which consist of senior leaders and experts from Plastics and Allied Industry, Associations under which more than 1 Lakhs Industrial units and has been further substantiated by various study reports, Annual reports etc.

What is the estimated uptake of this qualification and what is the basis of this estimate?

The Skill gap report states that, incremental human resource requirement for the chemical sector is 1.95 lakhs by 2022. Refer: Name of the Report "Are port of C&PC on Framework for Skill Management in the chemical sector.

What steps were taken to ensure that the qualification(s) does/do not duplicate already existing or planned qualifications in the NSQF?

Mapping of Chemical Effluent Treatment Plant Operator has been done with National Classification of Occupation 2015 to ensure the qualification does not duplicate, the qualification have being checked with qualification pack of other sectors like Rubber, Electronics etc and there is no duplicity observed in terms of contents, module/syllabus covered etc.

The NSDC list of approved and under developed Qualification Packs was checked prior to stating the work to ensure no duplicity.

What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated?

Qualification documents shall be revised once in a year and CIPET shall collect the feedback from Industries/ Associations and necessary revisions/updating in Qualification document will be carried out. Feedback mechanism has been created by CIPET. Based on the Industry feedback in term of employability, course coverage, placement factors etc will be checked and growth indicators will be identified and reviewed by CIPET.

ANNEXURE:

7. Presentation of 2nd core group committee meeting along with Minutes of meeting approved by members
- 9 (b). A Report on Human Resource and Skill requirement for the Chemicals and Pharmaceutical sector (2022) by NSDC.
- 9 (c). Brief report of Chemicals and petrochemicals Industry in India, April 2015, Corporate Catalyst India Pvt Ltd, Page 4

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SECTION4

EVIDENCE OF RECOGNITION AND PROGRESSION

What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?

Relevant information was collected from Industries and allied sector working in this area. The Plastics industries are recruiting people based on the qualification acquired. Maximum of the industries accept this as qualification for selection/short listing of the individual **(Minutes of Meeting of Core committee is attached).**

The skills acquired at level 4 for a particular duration makes it easy for the Individual to progress to the next level.

Vertical Pathway:

The Occupational Map has been created & attached.

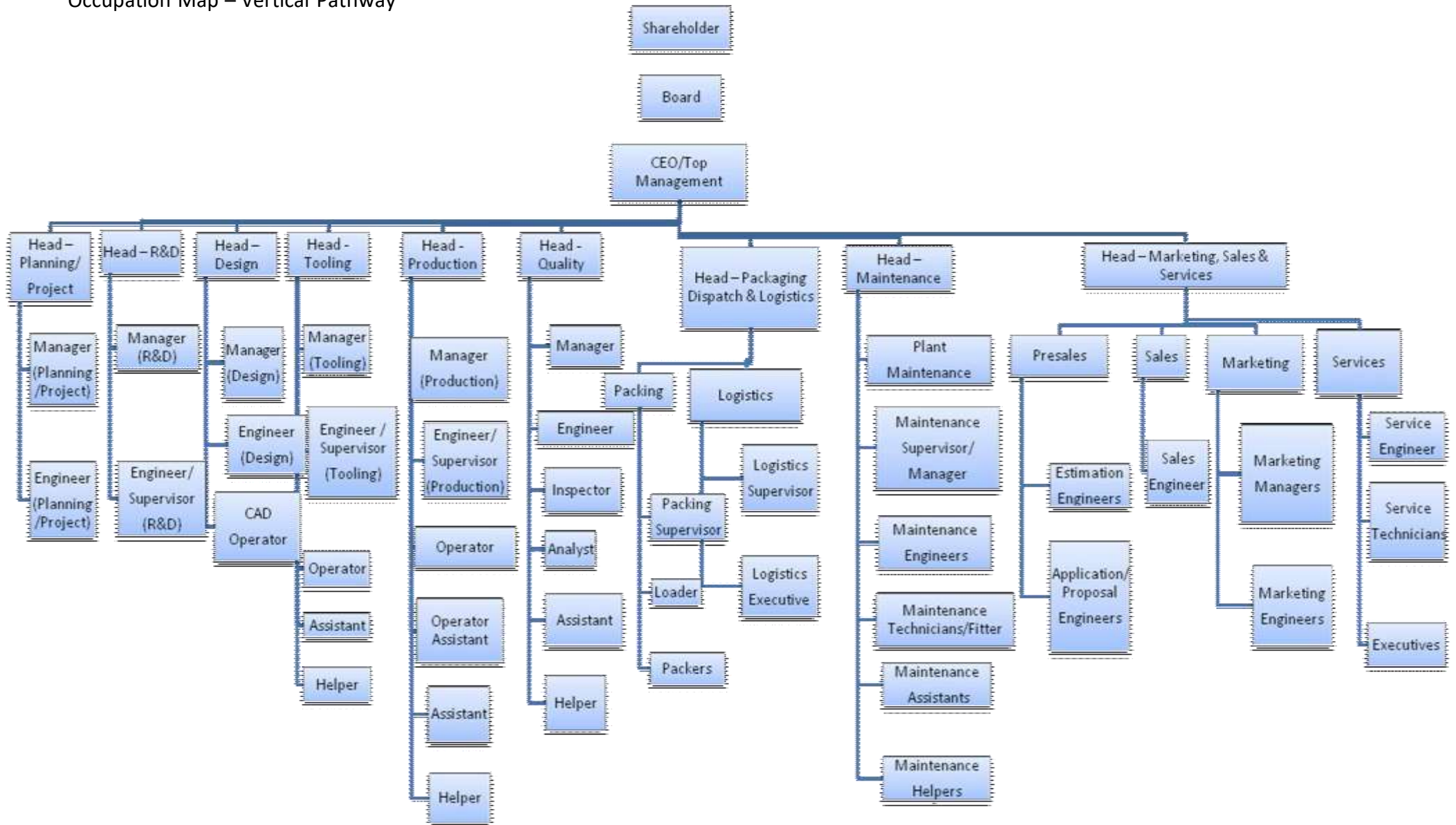
The Chemical Effluent Treatment Plant Operator has a clear pathway to Chemical Plant Supervisor.

Horizontal Pathway:

The individual can migrate within the chemical processing related industries

QUALIFICATION FILE

Occupation Map – Vertical Pathway



Job Role: Chemical Effluent Treatment Plant Operator