مجلس أبـــوظبـي للـجـودة والـمـطابـــقـة
ABU DHABI QUALITY & CONFORMITY COUNCIL

ABU DHABI OCCUPATIONAL TERMS

HVAC Team Leader – Level 4

22 NOVEMBER 2018
FIRST EDITION

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Amendment Page

This Amendment Page updated and issued with each set of revised and/or new pages of the document to help ensure that each copy of this Abu Dhabi Occupation Term (ADOT) contains a complete record of amendments.

This Occupational Term is a live document, which can be amended when necessary. QCC can review stakeholder comments in order to review and amend this document; ultimately resulting in an issuance of an updated version, if necessary.

Log of Amendments						
Amendment			Discard		Insert	
No.	Date	*Sections Changed	Page(s)	Issue No.	Page(s)	Issue No.

About the Abu Dhabi Quality & Conformity Council

The Abu Dhabi Quality and Conformity Council (QCC) were established by law No. 3 of 2009, issued by His Highness Sheikh Khalifa Bin Zayed Al Nahyan, President of the UAE. QCC is responsible for the development of Abu Dhabi Emirate's Quality Infrastructure, which enables industry and regulators to ensure that products, systems and personnel can be tested and certified to UAE and International Standards.

Products and services certified by QCC receive the Abu Dhabi Trustmark. The Trustmark designed to communicate that a product or system conforms to various safety and performance standards that set by Abu Dhabi regulators.

Foreword

The QCC, along with relative stakeholders, had developed occupational terms for 21 unique occupations in the construction sector. This was required because of a high dependence on migrant labor to fill key technical roles in the skilled trades and concerns about the productivity of the industry where skills investment is inconsistent.

The occupational terms are professional standards that personnel must meet in order to perform the jobs they assigned to, to produce quality outcomes. The Government of Abu Dhabi, under the leadership of His Highness Sheikh Khalifa bin Zayed Al Nahyan, President of the UAE and Ruler of Abu Dhabi, and His Highness Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi, Deputy Supreme Commander of the UAE Armed Forces and Chairman of the Abu Dhabi Executive Council, has invested heavily, and at high levels of professionalism and safety, in the Infrastructure of Abu Dhabi. Therefore, it is crucial and obligatory to encourage the presence of skilled workmanship to maintain the quality infrastructure value in the Emirate of Abu Dhabi in particular and the United Arab Emirates in general.

Acknowledgments

The QCC would like to thank the members of the working group listed below:

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Introduction

- Qualification Pack - HVAC Team Leader
- Brief description of Job – A HVAC team leader is an important job role in HVACR works that cater as a mentor for the HVAC technicians and workers and a resource person to implement the work strategy under HVAC supervisors.
- Personal attributes – A HVAC team leader should be a good team player who has thorough knowledge in installation and maintenance of HVACR equipment and fittings including but not limited to Chillers, Compressors, AHU's, DX systems, Roof top units, VRV units, Chilled water pipes, refrigerant pipes, valve packages, Ducts & its accessories etc.…

Duties and responsibilities	To lead a team of level 3 and level 2 HVAC technicians to install and maintain the HVAC installations and activities on construction sites and required maintenance workers under foreman and supervisors, read and implement the approved shop drawings and details.
Min. qualification	Technical diploma of refrigeration & air-conditioning/Mechanical after high School Diploma/ An Industrial Training Institute certification (ITI) or has 3 years of work experience as level 3 HVAC technician.
Training **(Suggested but not mandatory)**	On the job training for 6 months.
Work Experience	In line with min qualification he should have a total of 5 years of HVAC work experience among 3 years should be as level 3 HVAC technician.
Performance criteria	As described in relevant chapters

Occupational Terms

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No.	Field	Details		
8.	Grading	**Application unit**: *Competent/Not Yet Competent*		
9.	Industry sector	Construction & Maintenance		
10.	Developed by	Know How	Government Entities	Abu Dhabi Quality & Conformity Council
11.	Endorsement date	TBD		
12.	Frequency of review	2 Years		
13.	Version No.	0		
14.	ISCO-08	7124 Insulation Workers, 7126 Plumber and pipe fitters, 7127 Air Conditioning & Refrigeration Mechanics, 7213 Sheet Metal Workers		

Key terms

Term	Description
Personal Protective Equipment (PPE)	Items that construction workers can use to protect themselves against hazards. PPE includes but not limited to gloves, safety helmet, eye protection, face protection, foot protection and appropriate clothing.
Risk	Risk is the product of the measure of the likelihood of occurrence of an undesired event and the potential adverse consequences which this event may have upon: · People – injury or harm to physical or psychological health · Environment – water, air, soil, animals, plants and social Risk = frequency x consequences
Hazard	Any substance, physical effect, or condition with potential to harm people, property or the environment.
OSHA	Occupational Safety & Health Administration
OSHAD	Abu Dhabi occupational safety and health center
Building diagram	A technical drawing of a structure or building which drawn in a scale that is proportionate to its real-world dimensions. Building drawings include site plans, floor plans, elevations and sections. Drawings that provide additional specific/specialist details known as Coordination Drawings.
Cross Section	A section is a type of building drawing. It represents a vertical plane cut through the structure.
Elevation	An elevation is a type of building drawing. It is a drawing of the exterior or interior of a building or structure as seen from a horizontal position - without dimensional perspective.
Floor plan	A floor plan is a building drawing. It is a drawing to scale showing a view from above, of the relationships between rooms, spaces and other physical features at one level of a structure.
Layout drawing	An approved design or plans to show the way things are arranged
Site Plan	A site plan is a type of building drawing that shows a new or existing building's position in relation to the boundaries of the block of land.
Work instructions	Written or verbal description of the work to be undertaken by an individual or work team.
HVAC	Heating, Ventilation, & Air Conditioning here refers to "Self-Contained Equipment" i.e. Complete, factory-assembled and tested, heating, air-conditioning equipment installed as a single unit, and having all working parts, complete with motive power, in an enclosed unit of said machinery and/or Split System/DX Split System consisting of indoor unit housing evaporator & fan and outdoor unit housing compressor, condenser and heat rejection fan.
Cassette unit	HVAC equipment installed in false ceiling which recirculates & provides cool air and is part of DX and chilled water equipment.
Airside Chilled Water	HVAC equipment dealing with recirculate, outdoor, or mixed air for purpose of cooling & ventilation

Equipment	
Air Handling Unit	A series of components joined in section that provide cool air and/or treated ventilation air to space directly or indirectly.
Ceiling Suspended Ducted Unit	HVAC equipment hung or installed above false ceiling suspended from slab of floor above.
Compressor	A compressor is a mechanical device that increases the pressure of a gas by reducing its volume. It's the main component in the refrigerant cycle of air conditions and refrigerators. Different types of compressors are Reciprocating compressors, Screw Compressors, Scroll compressors, Centrifugal compressors…
Duct	A tube or conduit utilized for conveying air. The air passages of self-contained systems are not to be construed as air ducts
Duct Accessories	Fire Dampers, Motorized Fire Dampers, Motorized Smoke Dampers, Motorized Combined Fire & Smoke Dampers, Volume Control Dampers installed in duct system to serve designed purpose
Duct Fittings	A piece of duct in a standard form or shape to connect two pieces of ducts
VAV's	Variable air volume (VAV) is a type of heating, ventilating, and/or air-conditioning (HVAC) system. Unlike constant air volume (CAV) systems, which supply a constant airflow at a variable temperature, VAV systems vary the airflow at a constant temperature
DX Equipment	Abbreviation of Direct Expansion; of Refrigerant that takes advantage of latent heat of the refrigerant fluid, and cools it by expansion
Equipment	All piping, ducts, vents, control devices and other components of systems other than appliances which are permanently installed and integrated to provide control of environmental conditions for buildings
Fabricate	Construct or manufacture
Fan Coil Unit	A simple device consisting of cooling coil, fan, motor, & filter used for providing cool air to space
Install	Place or fix equipment or an item in position ready for use
Insulate	The act of protecting something by surrounding it with material that reduces or prevents the transmission of heat
Piping	**Pipe:** A rigid conduit of iron, steel, copper, brass or plastic. **Tube:** Semi rigid conduit of iron, steel, copper, brass or plastic
Pressure Test	A test following the installation of new equipment/piping system or modification of existing equipment/piping system where the equipment/piping system is place under pressure to ensure that it will not leak.
Refrigerant	A substance or mixture, usually a fluid used for cooling & heating application.
Rooftop Package Unit	Self-contained HVAC equipment installed on roof that provide cool and/or treated air directly or indirectly to space.
Valve Package	Chilled water valves & accessories installed to operate, test, commission, & maintain equipment such as Fan Coil Unit, Air Handling Unit etc.
Wall Mounted Unit	A part of split system, installed in a space, where it provides recirculates & provides conditioned air.

VRF	Variable refrigerant Flow
EC-Motor	Electronically communicated Motor
VFD	Variable Frequency Drive
PLC	Programmable Logic Control
PICV	Pressure Independent Control Valves
DRV	Double Regulating Valve
BMS	Building Management System
WMS	Work Method Statement
SOP	Standard operating Procedure
GMP	Good Manufacturing Practices

Performance Criteria

Element1: Monitor- inventory, assembly, installation, operation and maintenance of HVAC equipment and Systems.

Scope	• Inventory assembly and Installation • System Checks • Maintenance
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Inventory, assembly and Installation	To be competent, the user/individual on the job must be able to: PC1. coordinate with in & out of organization to determine proper selection of materials and spare parts for installation and maintenance of HVAC equipment PC2. assist in maintaining proper levels of materials/supplies to ensure timely and efficient completion of necessary task PC3. assist in purchase of materials and ensure prevention of defects and maintenance of quality as per requirement PC4. follow the procedure for additional or new installations in assigned job site as per approved WMS PC5. identify defect/problem in HVAC equipment installations
System Checks	PC6. start, operate, monitor and adjust HVAC equipment to ensure proper working (such as air flow and turbulence, pressure differentials, filter efficiencies) PC7. ensure compliance with all regulations and company policies, including inspection and re-inspection of HVAC equipment as per GMP and O&M standards PC8. review all work orders before and after completion PC9. take corrective action in response to typical faults and inconsistencies in equipment readings PC10. set up appropriate equipment or apparatus for testing correctly PC11. calibrate the equipment periodically as per the SOP and manufacturer recommendations PC12. identify defective equipment/apparatus and steps to be taken like support preventive maintenance activities PC13. verify the equipment accuracy by comparing with the standard reference PC14. respond to emergency calls for system and equipment failure
Maintenance	PC15. set and adjust controls PC16. assist relevant stakeholders of HVAC with technical support; technical data, fault identification… PC17. ensure that maintenance helper is working as per the SOP PC18. She/he shall train and guide his Team of Mechanics & Technician for the operation and maintenance of the HVAC Equipment & systems in accordance with the manufacturer's instructions, Equipment O & M Manuals and the provided PMP of the manufacturer and shall also attend and coordinate training session from Equipment Manufacturer/vendor for the proper Maintenance of HVAC Equipment. PC19. He shall be fully aware of the Building HVAC installations Maintenance

	management system. PC20. Shall implement the safe Refrigerant handling and monitoring practices.

Element2: Prepare effective maintenance schedules and ensure smooth flow of work

Scope	• Maintenance Schedules • Operations
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Maintenance Schedules	To be competent, the user/individual on the job must be able to: PC1. inspect the manpower requirement based on maintenance required PC2. identify the material requirements for carrying maintenance PC3. support preparing planning schedule for maintenance activities by maintenance manager (including preventive maintenance) while ensuring that work is not hindered PC4. select the suitable alternatives in case the appropriate equipment and materials are not available for maintenance and inform the appropriate person PC5. plan the schedule of workmen for maintenance process PC6. inform the workmen of the maintenance schedules PC7. display the appropriate signage for the work being conducted PC8. assign and distribute work orders and work requests PC9. follow vacation schedule for assigned team and ensure that work is not affected adversely PC10. identify and provide appropriate Tools & Tackles for Maintenance Crew.
Operations	PC11. ensure that there is adequate ventilation for the work being carried out PC12. ensure that the workmen are on time as per the schedule PC13. ensure that work is carried out on time PC14. ensure that they are carrying out their work without disturbing others PC15. provide technical assistance when requested PC16. replenish any necessary supplies or consumables PC17. report to the appropriate person any disturbances in material flow or equipment PC18. identify and report to the appropriate person any additional work required that is outside one's responsibility or skill PC19. follow workplace procedures to deal with any accidental damage caused during the installation and maintenance process and adhere to 5S and TPM guidelines PC20. ensure that, on completion of the work, the area is left clean and dry and meets requirements PC21. ensure that the equipment, materials and personal protective equipment that were used are returned to the right places making sure they are clean, safe and securely stored PC22. assist to determine time and cost estimates for installation and maintenance

Element3: Carry out reporting and documentation for maintenance activities

Scope	• Reporting • Recording and Documentation • Information Security
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Reporting	To be competent, the user/individual on the job must be able to: PC1. report data/problems/incidents as applicable in a timely manner PC2. report to the appropriate authority as laid down by the company PC3. follow reporting procedures as prescribed by the company PC4. inform supervisors about completed and outstanding work orders in the appropriate means & Software for maintenance.
Recording and Documentation	PC5. identify documentation to be completed relating to one's role PC6. record details accurately in the appropriate format PC7. prepare complete job documentation including site assessments, daily status reporting, assessment reports, post installation reporting, lessons learned, opportunity for improvement, serial number and other relevant information PC8. maintain time, materials and equipment use reports PC9. maintain records of all data attendance and provide effective training to all team PC10. complete all documentation within stipulated time according to company procedure PC11. ensure that the final document meets the requirements of the individuals who requested it or make any amendments accordingly PC12. HVAC Team Leader shall have skills and knowledge of Electronic Data Entry, reporting and communications. He shall be skilled enough to manage data of all alarms and faults from the BMS system and shall keep history of all maintenance activates on the computerized MMS software
Information Security	PC13. respond to requests for information in an appropriate manner while following organizational procedures PC14. inform the appropriate authority of requests for information received

Element4: Identify and resolve issues related to installation, operation or maintenance of HVAC equipment and systems.

Scope	• Inspection • Analysis
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Inspection	To be competent, the user/individual on the job must be able to: PC1. inspect maintenance works to ensure compliance with standard procedures PC2. undertake immediate actions to resolve sudden errors or faults in equipment or functionality of systems PC3. identify non-conformities to the company maintenance SOP

Analysis	PC4. analyze potential causes of non-conformities to operation & maintenance standards and should conduct root cause analysis if required to sort the issue PC5. evaluate the need for action to ensure that problems do not recur and ensure zero productivity loss due to idle machine/equipment and manpower PC6. suggest corrective action to address problem PC7. review effectiveness of corrective action PC8. interpret the results of the inspection correctly PC9. analyze complex drawings, specifications and comprehend oral instructions and general requirements of the job.

Element5: Maintain a healthy, safe and secure working environment

Scope	**Ensuring healthy, safe and secure working environment:** • self-monitor and adhere to safety principles and standards • ensure behavioral safety by workmen to good building maintaining practices and applicable safety standards on the buildings • report any identified breaches in health, safety, and security policies and procedures to the designated person **Managing emergency procedures**: • illness • accidents • fires • other reasons to evacuate the premises • breaches of security
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Ensuring healthy, safe and secure working environment	To be competent, the user/individual on the job must be able to: PC1. observe and comply with the company's current health, safety and security policies and procedures PC2. while carrying out work, use appropriate safety gears like head gear, masks, gloves and other accessories as mentioned in the guidelines PC3. report any identified breaches in health, safety, and security policies and procedures to the designated person PC4. responsible for maintaining discipline at the HVAC working area PC5. identify and correct any hazards that the individual can deal with safely, competently and within the limits of their authority PC6. adhere and comply to storage and handling guidelines for hazardous material PC7. identify and recommend opportunities for improving health, safety, and security to the designated person PC8. electrical safety must be followed all times while doing maintenance. PC9. procedures like LOTO, installing warning signs etc… should be implemented while working with energized equipment. PC10. ensure that any electrical equipment under maintenance is isolated from electrical power supply and other potential hazards

	PC11. complete any health, safety and security activities like safety drills and prepare records legibly and accurately PC12. knowledge of chemical substances, their characteristics and required precaution and safety measures PC13. the importance of maintaining high standards of health, safety and security PC14. implications that any non-compliance with health, safety and security may have on individuals, in the maintenance process and the organization
Managing emergency procedures	PC15. report any hazards that the individual is not competent to deal with to the relevant person in line with organizational procedures and warn other people who may be affected PC16. follow the company's emergency procedures promptly, calmly, and efficiently PC17. evacuation procedures for workers and visitors PC18. how to summon medical assistance and the emergency services, where necessary PC19. how to use the health, safety and accident reporting procedures and the importance of these procedures PC20. different types of occupational health hazards PC21. shall be aware of the Abu Dhabi Environment, Health and safety management systems and shall implement as applicable in coordination with Health & Safety Team. PC22. apply all OSHA guideline requirements when performing the job

Technical Knowledge

Relevant work Context	The user/individual on the job needs to know and exhibit: TK1. Installation, working, fault identification, trouble shooting of HVAC equipment and related components. TK2. Knowledge of tools and equipment handling TK3. Knowledge of standards like SMACNA, ASRHAE… related to HVAC systems TK4. use of data analytics tools and methods to analyze and interpret the data/information captured from the HVAC equipment TK5. methods of using test and diagnostic equipment used in the calibration and repair of HVAC systems including faulty control systems such as direct digital, electronic, electric, pneumatic etc TK6. requirements of different shutdowns and appropriate maintenance, including emergency and routine shutdowns and procedures to follow in the event of a power outage TK7. operating requirements, parameters and corrective action required where operation is outside specified operating parameters TK8. Chemicals, gases and liquids used in the HVAC system maintenance and its functions TK9. Knowledge of testing, repairing or replacing motors, pumps, relays, switches, starters, wiring and other functional components

Knowledge and Understanding

General & organizational Context	The user/individual on the job needs to know and exhibit: KA1. organizational coding system of HVAC and company manual KA2. different quality management systems (ISO-9000, TS16949, ISO-14001, OHSAS-18000) KA3. impact of various practices on cost, quality, productivity, delivery and safety KA4. characteristics of the material and equipment required in setting up HVAC equipment and their maintenance KA5. implications of using inaccurate measuring and testing equipment KA6. the reason, impact and reoccurrence of equipment failure KA7. the correct method for carrying out corrective actions outlined for each Problem and risk and impact of not following the defined procedures/work instructions KA8. escalation matrix for reporting identified issues, hazards and breakdown KA9. types of documentation used in the organization, importance of maintaining the same and different methods of recording information KA10. procedures for reporting any unresolved issues in maintenance and operation KA11. energy management systems KA12. quality requirements of materials and equipment KA13. method of preparation of estimates and materials order for maintenance and repair jobs KA14. basic computer knowledge including MS office operation KA15. ability to identify documental errors in technical reports. KA16. environmental issues and controls relevant to the process, including waste/rework collection and handling procedures related to the process

Soft Skills

A. Core Skills/ Generic Skills	**Reading Skills**
	The user/ individual on the job needs to know and understand how to: SA1. read, understand and interpret manuals, SOPs, health and safety instructions, memos, reports, job cards etc. SA2. read various coding systems as per company norms
	Writing skills
	SA3. do legible entries with permanent ink SA4. write detailed reports for investigation SA5. pay attention to detail while recording maintenance parameters
	Oral Communication (Listening and Speaking skills)
	SA6. communicate with upstream and downstream teams with a proper form and manner and use language that is open and respectful SA7. effectiveness in emergency response and communication
B. Professional	**Plan & Organize**

Skills	SB1. plan and organize resources to ensure assembly, installation and maintenance activities adhere to schedule SB2. multi-task and adapt to meet work timelines SB3. effectively delegate and lead to plan, lay out, supervise and inspect the work of subordinates
	Decision Making
	SB4. evaluate multiple options on defined, objective parameters when taking assembly, installation and maintenance decisions SB5. collaborate with the team for identifying appropriate decisions SB6. apply commercial awareness as a decision parameter
	Critical Thinking
	SB7. apply balanced judgment to different situations SB8. apply basic mathematical and statistical knowledge
	Analytical Thinking
	SB09. analyze operations data and information to identify assembly, installation and maintenance needs SB10. pay attention to detail for identifying faults and anomalies SB11. spot process disruptions and delays and report and communicate these to the supervisor with solutions
	Problem solving
	SB12. solve conflicts and negotiate on behalf of the team and within the team or get help from an appropriate person, in a way that preserves goodwill and trust SB13. explore new ways of doing things SB14.identify and objectively evaluate both temporary/short-term and permanent/long-term solutions

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