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SOP-046

Contractor Maintenance of AC Units

Last Review Details – Refer to QPulse for full history

Review Comments	Review Owner	Date
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Latest Revision Details – Refer to QPulse for full history

Revision number	Revision Details
5	Updated Legislation and change in the testing sections 6.1.7 and 6.1.9.

Approval details for latest Revision

Approver	Date	Response
Xuereb, Graziella	26/04/2024 11:10	Accept
Baldacchino, Damian	30/04/2024 11:02	Accept
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1 Aim and scope

The objective of this operational procedure is to specify methods, frequency and responsibilities related to the maintenance of air conditioning units at any Enemalta plc site as required.

The SOP is addressed to all work performed by a contractor in connection to Air Conditioning Maintenance or installation of new units for Enemalta plc.

2 References

EN ISO 14001:15/Amd 1 :2024, clause 8.1

EN ISO 14001:15/Amd 1 :2024, clause 9.1

BS EN378-1:2016+A1:2020

BS EN 378-2:2016

BS EN 378-3:2016+A1:2020

BS EN 378-4:2016+A1:2019

Regulation (EC) No.1005/2009 (recast)

Regulation (EU) 2024/573

Commission Implementing Regulation (EU) No 1191/2014 (as amended)

Commission Implementing Regulation (EU) 2015/2067


Commission Implementing Regulation (EU) 2016/879

S.L. 549.58– Substances Depleting the Ozone Layer Regulations, 2010

S.L. 427.94– Fluorinated Greenhouse Gases (Implementing) Regulations

3 Terms and Definitions

CMP	Contractor's Maintenance Personnel
CRO	Contractor's Responsible Officer
DPS	Delimara Power Station
EMS	Environmental Management System
ENE	Enemalta plc
ERO	Enemalta Responsible Officer
MCCAA	Malta Competition and Consumer Affairs Authority
MPS	Marsa Power Station
SOP	Standard Operating Procedure

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4 Responsibilities

4.1 Contractor's Responsible Officer (CRO)

- Informs ERO about any discrepancies in the information of the installed units at a specific location
- Notifies ERO of any irregularities in the list
- Keeps Air Conditioning Units' Logbook updated from the job sheets provided by CMP:
- Sheet 1 – Faults
- Sheet 2 - Preventive Maintenance
- Sheet 3 – Waste
- Keeps records as per SOP

4.2 Enemalta Responsible Officer (ERO)

- Annually defines the Air-conditioning Preventive Maintenance plan
- Updates AC list as and when required
- Keeps all relevant records for 5 years

4.3 Contractor's Maintenance Personnel (CMP)

- Act in accordance with this procedure and any other related operative instructions
- Make records on job sheets as per SOP

5 Frequency

This document should be reviewed and updated every 24 months, or when changes require so.


6 Detailed Procedural Rules

6.1 Preventive maintenance of air conditioning units

Preventive maintenance shall be carried out by the CMP. This shall include, but is not limited to:

- Cleaning/renewal of air filters;
- Cleaning of evaporator;
- Checking the efficiency of the unit;
- Checking the refrigerant charge;
- Checks for leaks, the condition of all copper pipe work, insulation material, drain pipe and the general state of the indoor and outdoor units.

If any faults/abnormalities are encountered during the preventive maintenance, corrective actions have to be carried out accordingly as indicated below.

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The preventive maintenance should be recorded by the CRO on **sheet 2 (Preventive Maintenance)** of Air Conditioning Units logbook.

6.1.1 Cleaning/renewal of air filters

Air filters should be taken off the indoor unit and washed with clean water

Before re-fitting into indoor unit, the air filters should be dry

If any filters are damaged, these should be renewed.

6.1.2 Cleaning of evaporator, Blower fan, Vertical/Horizontal Flaps, and Indoor Unit Cover

The evaporator should be cleaned using an evaporator cleaner with antibacterial properties found in aerosol spray packaging, which crumbles and emulsifies any dirt present. The Blower fan, Vertical/Horizontal Flaps and Indoor Unit cover must be wiped clean of any dirt build up using a damp cloth or under running water as appropriate.

6.1.3 Checking the efficiency of the unit

The temperature meter is used, indicating the room temperature and the indoor unit's air flow temperature. The unit is checked to ensure superheat is per parameters (5°C -10°C).

6.1.4 R22 Refrigerant

As from 1st January 2015, no virgin or recovered R22 can be used to service air-conditioning units.

If leaks are detected in any air-conditioning unit that is still in service and it contains R22 gas, all the R22 gas is to be extracted and the possible solutions should be considered:


- Drop-in refrigerant replacement
- Replacement of the unit

Records of any R22 gas extracted from Enemalta AC units are to be recorded on **either sheet 1 (Faults) or sheet 2 (Preventive Maintenance)** of Air Conditioning Units logbook . The reclaimed R22 gas is to be disposed of as EWC 14 06 01* (chlorofluorocarbons, HCFC, HFC) in a permitted waste management facility as per **SOP-045 – Waste Management Procedure for Contractors**.

6.1.5 Checking the refrigerant charge

The air conditioning unit is set to 'cool' and with the lowest temperature possible. The low pressure side (blue) of the pressure gauge manifold is connected to the suction line (larger tube) of the outdoor unit. The pressure gauge should read the corresponding average pressure of the respective refrigerant at room temperature.

If refrigerant top-up is needed, the middle hose (yellow) of the pressure gauge manifold is connected to the appropriate refrigerant cylinder and the unit is charged accordingly, taking note of the amount of refrigerant charged by weighing the refrigerant cylinder before and after the charge. A calibrated electronic weighing scale is used. This is to be calibrated by an appointed lab from MCCA every year and the calibration certificate is to be made available by the contractor to Enemalta on demand. Records of any quantities of gas topped up must be recorded on either **sheet 1 (Faults) or sheet 2 (Preventive Maintenance)** of the Air Conditioning Units logbook.

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6.1.6 Cleaning of Outdoor unit condenser Fins / Fan Blades and Cabinet

Brush off gently any dirt buildup on the condenser fins using a soft brush or air blower. Wipe fan blades and outdoor unit cover.

6.1.7 Checking against leaks and the condition of all copper pipe work, insulation material, drain pipe and the general state of the indoor and outdoor units

Refrigerant leaks are checked using an appropriate and calibrated gas leak detector. Calibration of the instrument is performed during every maintenance procedure and calibration records are to be made available by the contractor to Enemalta on demand. All hardware checking is done visually. If refrigerant leaks are detected, then the unit has to undergo maintenance to find the leak and this should be repaired. Following maintenance and repair of unit as necessary, a leak detection test should be carried out again to confirm that there are no leakages. The unit will be put back into operation once no leaks are detected.

Any damaged material such as, but not limited to, insulation material and drainpipes should be replaced.

6.1.8 Maintenance, repairs or disassembling of part/all of the refrigerant circuit of a unit


The CMP should do the pump-down of the refrigerant from the air conditioning unit using a refrigerant recovery unit as the first step before starting any maintenance, repairs or disassembly which affects the refrigerant circuitry.

If the unit is repaired and the refrigerant circuit is once again assembled, the CMP should then vacuum the system before this is re-charged with the proper refrigerant. The charging amount is specified on the manufacturer's label found on the outdoor unit.

6.1.9 Leak testing for air conditioning units that contain fluorinated greenhouse gases in quantities of 5 tonnes of CO₂ or more, but less than 50 tonnes of CO₂

A Leak test on any air conditioning unit which contains fluorinated greenhouse gases in quantities of 5 tonnes of CO₂ or more, but less than 50 tonnes of CO₂ shall be carried out once per year by the CMP in line with the yearly preventive maintenance plan established by the ERO. Together with the yearly preventive maintenance, any amount of refrigerant recovered from or charged into such an air conditioning unit should be quantified and recorded by the CRO on **sheet 2 (Preventive Maintenance)** of the Air Conditioning Units logbook from job sheets handed in by the CMP. Leakages, maintenance and follow-up actions of these units should also be reported on this Log Sheet.

If refrigerant leaks are detected, then the unit has to undergo maintenance to find the leak and this should be repaired. Following maintenance and repair of unit as necessary, a leak detection test should be carried out again to confirm that there are no leakages. The unit will be put back into operation once no leaks are detected.

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6.1.10 Reporting

All reporting is to be done on the Air Conditioning Units logbook (in Excel format) as follows:

Sheet 1 (Faults) of the Air Conditioning Units logbook should be filled in by the CRO for any maintenance work done on the units from job sheets handed in by the CMP and are to be made available to the ERO upon request.

Sheet 2 (Preventive Maintenance) of the Air Conditioning Units logbook as mentioned previously.

Sheet 3 (Waste) of the Air Conditioning Units logbook should be filled in by the CRO from job sheets handed in by the CMP of any generated waste resulting from works carried out on Air conditioning units installed at Enemalta premises.

An updated list of all the Air conditioning units at MPS, Enemalta Stores and District Offices/Distribution Centers should be kept by the ERO and any required changes to be highlighted by the CRO.

6.2 External Audits

The CRO should keep all records needed for external audits updated and readily available to the ERO upon request. Any queries should be discussed and tackled within specified timeframes. Audits are usually carried out annually between May and August.

7 Reference Documents

Number	Type	Title
SOP-045	Non- Restricted\Procedures (SOP/WI/Mg.Proc)	Waste Management Procedure for Contractors
SOP-072	Non- Restricted\Procedures (SOP/WI/Mg.Proc)	Internal & External Communication

The documents below are held at the Facilities Office:

Sheet 1 – Faults of Air Conditioning Units logbook

Sheet 2 - Preventive Maintenance of Air Conditioning Units logbook

Sheet 3 – Waste of Air Conditioning Units logbook

Air-conditioning Preventive Maintenance Plan

Air-conditioning units list



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Sheet 1 (Faults)

Air Conditioning Units logbook

Reported Date	Location	Office /Room	Fault Details		Type of Fault	Any Replaced Components	Type and Amount of Gas		Leak Test Result	Maintenance Work Carried Out	Additional Remarks	Repair Date	Technicians Name	Job no	Costs and Gas as per Duration (Hours)
			Registration no.	Office /Room			Amount of Gas Added (g)	Amount of Gas Retrieved (g)							
23/05/2017	MPS	New Meets Offices	MBA-007/034		Leaking water	3m drain pipe					Water pipe was replaced	23/05/2017	x	13664	1.00
24/05/2017	Siemadistrict	Office - Engineer	DSL-220/0306		Remote not working						Receiver taken for repair	25/05/2017	x	13516	0.50
25/05/2017	MPS	Development STU's	CDE-007/0375		Unit not responding to remote control						Indoor PCB taken for repair	26/05/2017	x	13471	1.00
26/05/2017	Marsa South DC	Office - Control Room	CMR-000/0371		AC not Cooling	Outdoor fan capacitor	1000.00				Changed outdoor fan compressor and topped up unit with gas	26/05/2017	x	13472	1.00
26/05/2017	MPS	Meets Test Room	CMR-220/0378		AC Not Cooling						The fan was cleaned from rust which was blocking it	23/05/2017	x	13666	0.75



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Sheet 2 (Preventive Maintenance) Air Conditioning Units logbook

Scheduled Preventive				Preventive Maintenance Details					Job no	
Date	Location	Office / Room	Registration no.	Any Replaced Components	Type and Amount of Gas Added (g)	Type and Amount of Gas Retrieved (g)	Leak Test Result	Additional Remarks	Technicians Name	
17/04/17	Mellieha DC	Computer Room	OML 410 0001		400.00		OK		X	13526
17/04/17	Mellieha DC	11kv room	OML 410 0002		800.00		OK		X	13526
17/04/17	Mellieha DC	11kv room	OML 410 0003		1800.00		OK		X	13526
17/04/17	Mellieha DC	33kv room	OML 410 0004		1000.00		OK		X	13526
17/04/17	Mellieha DC	33kv room	OML 410 0005		1000.00		OK		X	13526
17/04/17	St. Andrews DC	Control Room	OSA 410 001				OK		X	13527
17/04/17	St. Andrews DC	Control Room	OSA 410 002				OK		X	13527
17/04/17	St. Andrews DC	Battery Charger	OSA 410 003				OK		X	13527
17/04/17	St. Andrews DC	Battery Charger	OSA 410 004				OK		X	13527
17/04/17	St. Andrews DC	33kv room	OSA 410 005				OK		X	13528
17/04/17	St. Andrews DC	33kv room	OSA 410 006				OK		X	13528
17/04/17	St. Andrews DC	11kv room	OSA 410 007				OK		X	13528
17/04/17	St. Andrews DC	11kv room	OSA 410 008				OK		X	13528
18/04/17	Marsa DC	Control Room	OMR 220 0569				OK		X	13551
18/04/17	Marsa DC	Control Room	OMR 220 0570				OK		X	13551



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Sheet 3 (Waste) Air Conditioning Units Logbook

Date	Job no	EWC Code	Waste Description	Waste Carrier	Waste Management Facility	Net Weight (kgs)	Waste Consignment Note no
20/3/2017	13452	xx xx xx*	MOA 220 0142 Indoor and Outdoor				
20/3/2017	13452	xx xx xx*	MOA 410 0145 Indoor				
6/3/2017	13530	xx xx xx*	CSM 410 0386 Outdoor				