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SOP CNT 46

Maintenance of Air Conditioning Units by contractors

Revision list

Revision no.	Description	Written By/ Reviewed By	Date
0	First issue	P.Conti	07-05-2015

Reviewed by: P. Conti Environmental Coordinator	Verified by: E. Vella Principal Instrument & Control Technician	Approved by: I. Galea Business and Strategy Manager
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1. Aim and scope

The objective of this operational procedure is to specify methods, frequency and responsibilities related to 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 14001:04, clause 4.4.6

EN ISO 14001:04, clause 4.5.1

3. Terms and Definitions

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

4. Responsibilities

Responsible Officer (RO)

- Checks that Enemalta's EMS Air-conditioning units list is updated to indicate the actual units installed
- Annually defines the Air-conditioning Preventive Maintenance plan

Maintenance Personnel (MP)

- Act in accordance with this procedure and any other related operative instructions



5. Operative rules

5.1 Preventive maintenance of air conditioning units

Preventive maintenance shall be carried out by the MP. 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.

The preventive maintenance should be recorded by the MP on **FRM 3.2 - Air-conditioning Log Sheet**.

5.1.1 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.

5.1.2 Cleaning of evaporator

The evaporator should be cleaned using an evaporator cleaner with antibacterial properties found in aerosol spray packaging, which crumbles and emulsifies any dirt present.

5.1.3 Checking the efficiency of the unit

The temperature meter is used, indicating the room temperature and the indoor unit's air flow temperature.

Unit is checked to ensure superheat is per parameters (5°C -10°C)

5.1.4 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

The virgin or reclaimed R22 gas is to be disposed of as EWC 14 06 01* (chlorofluorocarbons, HCFC, HFC).

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5.1.5 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 calibrated by an appointed lab from MCAA every six months.

5.1.6 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 verified gas leak detector. Verification of the instrument is performed during every maintenance procedure (3kg and over).

All hardware checking is done visually.

Any damaged material should be replaced.


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

The MP 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 disassembling which affects the refrigerant circuitry.

If the unit is repaired and the refrigerant circuit is once again complete, the MP 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.

5.3 Air conditioning units with a rated refrigerant capacity of 3 kg or more

Preventive maintenance on any air conditioning unit with the rated total capacity of refrigerant being 3 kg or more as per manufacturer's specifications shall be carried out once per year by the MP in line with the yearly preventive maintenance plan established by the RO. 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 on the **FRM 3.3 - Air-conditioning Log Sheet (larger than 3kg)** by the MP. Leakages, maintenance and follow-up actions of these units should also be reported on this Log Sheet.

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5.4 Reporting

FRM 3.2 - Air-conditioning Log Sheet should be filled in by the MP for any maintenance work done on units with refrigerant charge of less than 3 kg. This is verified by the RO. These are stored in a database at the MP's office.

FRM 3.3 - Air-conditioning Log Sheet (larger than 3kg) should be filled in by the MP for any maintenance work done on units with refrigerant charge of 3 kg or more. This is verified by the RO. These are stored in a database at the MP's office.

An updated list of all the Air conditioning units at MPS, DPS, Enemalta Stores and District Offices/Distribution Centers should be kept by the RO.

6. Reference Documents

FRM 3.2 - Air-conditioning Log Sheet

FRM 3.3 - Air-conditioning Log Sheet (larger than 3kg)

Air-conditioning Preventive Maintenance Plan

EMS Air-conditioning units list

Electronic Weighing Scale Calibration Certificates

Leak Detector Calibration records

Regulation (EC) No.1005/2009

Regulation (EC) No. 842/2006

Regulation (EC) No. 305/2008

LN 280/2010 – Substance Depleting the Ozone Layer regulations, 2010.

LN 93/2010 – Certain Fluorinated Greenhouse Gases Regulations, 2010.



FRM 3.3 – Air-conditioning Log Sheet for Units with a Rated Refrigerant Capacity of 3 kg or more

General Information				
Plant Name			Reference Number	
Plant Location				
Room			Plant Type	
Capacity (Btu's)				
Refrigerant Type			Refrigerant Weight (g)	
Plant Manufacturer			Year of Installation	
Plant Operator				
Operator Contact				
Maintenance Work				
Date	Responsible Person	Serial No.	Maintenance Details	Changes & Replacements of Components
Refrigerant Additions				
Date	Responsible Person	Serial No.	Amount Added, g	Reason for Addition
Refrigerant Removals				
Date	Responsible Person	Serial No.	Amount Removed, g	Reason for Removal
Leak Tests				
Date	Responsible Person	Serial No.	Test Result	Follow Up Action Recommended
Follow Up Actions				
Date	Responsible Person	Serial No.	Related Test	Follow Up Action Taken
Significant Periods of Non-Use				