	File: SOP DPS 31 - Maintenance of AC units_r4_28-05-2016	
	Environmental Management System	Page 1 of 7


DPS SOP 31

Maintenance of Air Conditioning Units

Revision list


Revision no.	Description	Written By/ Reviewed By	Date
0	First issue	N. Falzon	16.09.2010
1	Minor modification to Annex 1 Removal of Annex 2 Minor Amendments to Sections 5.3 and 5.4	N. Falzon	30.11.2010
2	Minor amendments to Sections 5.1 & 5.3 & inclusion of new Annex 2	N. Falzon	23.05.2012
3	Modifications to SOP	S. Scicluna	02.09.2013
4	Removal of Annex 1 & 2	P. Conti	28.05.2016

Reviewed by: [Signed] P. Conti Environmental and Safety Coordinator [Signed] S. Bonnici DPS Mechanical Maintenance Engineer	Verified by: [Signed] J. Zammit Manager Energy Services	Approved by: [Signed] S. Scicluna Management Representative [Signed] I. D'Amato Manager Generation
---	--	--

	File: SOP DPS 31 - Maintenance of AC units_r4_28-05-2016	
	Environmental Management System	Page 2 of 7

Contents

1. Aim and scope	3
2. References	3
3. Terms and Definitions.....	3
4. Responsibilities	3
5. Operative Rules	4
5.1 Preventive maintenance of air conditioning units	4
5.1.1 Cleaning/renewal of air filters	4
5.1.2 Cleaning of evaporator	4
5.1.3 Checking the efficiency of the unit	4
5.1.4 Checking the refrigerant charge	5
5.2 Reporting	6
6. Reference documents.....	6

	File: SOP DPS 31 - Maintenance of AC units_r4_28-05-2016	
	Environmental Management System	Page 3 of 7

1. Aim and scope

The objective of this operational procedure is to specify methods, times and responsibilities related to maintenance of air conditioning units at DPS.

The SOP is addressed to the Air Conditioning Maintenance Section.

2. References

EN ISO 14001:04, clause 4.4.6

EN ISO 14001:04, clause 4.5.1

3. Terms and Definitions

RO Responsible Officer

MP Maintenance Personnel

DPS Delimara Power Station


4. Responsibilities

Responsible Officer (RO)

Checks that the Air-conditioning Yearly Preventive Maintenance Plan and DPS Air Conditioners Log Sheets are regularly updated

Maintenance Personnel (MP)

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

	File: SOP DPS 31 - Maintenance of AC units_r4_28-05-2016	
	Environmental Management System	Page 4 of 7

5. Operative Rules

5.1 *Preventive maintenance of air conditioning units*

Preventive maintenance of any air conditioning unit shall be carried out once per year by the MP, in line with the **Air-conditioning Yearly Preventive Maintenance Plan** as established by the RO. This shall include, but is not limited to:

- 5.1.1 Cleaning/renewal of air filters;
- 5.1.2 Cleaning of evaporator;
- 5.1.3 Checking the efficiency of the unit;
- 5.1.4 Checking the refrigerant charge;

Any amount of refrigerant recovered from or charged into any air conditioning unit should be quantified and recorded in **FRM 2.2 - Air Conditioning Log Sheet** by the RO. Leakages, faults or abnormalities encountered during the preventive maintenance and follow-up actions/corrective actions of these units should also be reported on this 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 the 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.
- The difference in temperatures should be of at least 11°C.
- If the difference in temperatures is less than 11°C, the unit should be checked.

	File: SOP DPS 31 - Maintenance of AC units_r4_28-05-2016	
	Environmental Management System	Page 5 of 7

NOTE: R22 Refrigerant

As from 1st January 2015, no virgin or recovered R22 can be used to service air-conditioning units. A stock control exercise is to be undertaken as from 31 December 2014 to keep track of the volume of R22 gas, be it in the virgin or reclaimed form, in possession by Enemalta plc. The document **FRM2.3– Refrigerant Gas Stock Management** is to be updated every 3 months and a copy retained by the RO. This document is also used to keep track of the stock of all refrigerant gases.

If leaks are detected in any air-conditioning units using R22 gas which are still in service, all R22 gas is to be extracted and possible solutions could be:

Retrofitting of the compressor to cater for a new gas

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).

5.1.4 Checking the refrigerant charge

- The air conditioning unit is set to 'cool' mode 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 the pressure is found low and it is suspected that there is a gas leak, the unit must be monitored and gas pressure recorded through some days. Pressure may vary due to ambient temperature conditions. If it is confirmed that there is a gas leak the refrigerant must be recovered into apposite clean cylinders specifically designed and labeled for this use. The unit is then pressure tested using nitrogen gas. A pressure of not more than 1.5 times the maximum operating pressure can be used. The outdoor and indoor units are isolated through isolation valves so as to be able to troubleshoot which is at fault. The suspected section, piping, etc is then checked with bubble soap.

Following the repair procedure the Air-condition unit is then vacuumed and regassed as per normal procedure.

	File: SOP DPS 31 - Maintenance of AC units_r4_28-05-2016	
	Environmental Management System	Page 6 of 7

If any refrigerant top-ups are required, these must be investigated, and if a leak is suspected the above procedure must be adopted.

To note is that refrigerants consisting of mixtures, such as R410A and R407C can only be slightly topped up. Since these are made up of a mixture of gases, any minor leak would decrease the concentration of the lighter gas, making the mixture of the remaining refrigerant inconsistent, which would result in a decreased efficiency of the unit. In such cases all the refrigerant must be recovered and disposed of as per EWC code 14 06 01

- A calibrated electronic weighing scale must be used whenever refrigerant is added. This is calibrated by an appointed lab from MCCA every six months and calibration certificates are to be retained by the RO. Furthermore RO also keeps a log of these calibration certificates using the form **FRM 2.4- Air-conditioning – Electronic Weighing Scale Calibration Certificates Log Sheet**.

5.2 Reporting


- **FRM 2.2 - Air Conditioning Log Sheet** should be filled in by the RO for any maintenance work done on air-conditioning units. These forms are to be handed over to the responsible manager and a soft copy retained by the RO for future reference.
- An updated list of all the air conditioning units should be kept by the RO.
- **FRM 2.3 – Refrigerant Gas Stock Management** should be filled in by the MP by end December 2014 to keep track of all volumes of virgin and/or reclaimed R22 gas stored at the MPS Air-conditioning Workshop. This is to be updated every 3 months.
- **FRM 2.4- Air-conditioning – Electronic Weighing Scale Calibration Certificates Log Sheet** is updated upon receiving the calibration certificate from a Competent Authority, on a 6-monthly basis.
- Log sheet and Certificate should be retained at the RO's office.

6. Reference documents

FRM 2.2 - Air Conditioning Log Sheet

FRM 2.3 – Refrigerant Gas Stock Management

FRM 2.4 - Air-conditioning – Electronic Weighing Scale Calibration Certificates Log Sheet

	File: SOP DPS 31 - Maintenance of AC units_r4_28-05-2016	
	Environmental Management System	Page 7 of 7

Air-conditioning Preventive Maintenance Plan

EMS Air-conditioning units list

Electronic Weighing Scale Calibration Certificates

Regulation (EC) No. 1005/2009

Regulation (EC) No. 842/2006

Regulation (EC) No. 305/2008

LN 280/2010

LN 93/2010