Internal safety rules for experimental activities in the DAΦNE Light Synchrotron Radiation Facility

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I - Reference legislation

The Italian master sources concerning health and general safety in workplaces are:

- a) D.lgs.81/08 and its following modifications and/or integrations;
- b) Internal emergency plan of the LNF (included in the **Safety Briefing link**);
- c) Individual rules in case of dangerous events (included in the Safety Briefing link).

II - Introduction

The rules presented in this document apply to the working activities at the **DAΦNE- Light Facility** (in the following also simply "**DAFNEL**") laboratory, only for what concerns the safety and health of workers. The DAFNEL working place is composed by the areas listed below, located at the LNF buildings n. 12 and 13 (see also the schematic plan in figure):

- Building 12 (ground floor): IR-SINBAD, UV-Vis DXR2 and Soft X-ray DXR1 beamlines
- Building 13: XUV LEB and HEB beamlines under commissioning.



Schematic plan of the DAFNE-Light laboratory - Buildings n. 12 and 13.



grafic by Claudio Federici - may, 2016

Schematic plan of the INFN-LNF laboratory.

a) Generality and access rules

- 1) The official schedule of experimental activities at the DAFNEL laboratory is prepared by the responsible of the different beamlines and has to be compatible with the general planning of the DA Φ NE complex and the LNF organization.
- 2) All personnel working AT the DAFNEL facility area **must** be authorized *in advance* for "Experimental activities", according to the safety rules and within the limitations of the present document, *irrespective* of their position of INFN staff, guest or other institution members. The authorization procedure is described in details in the dedicated section of the DAFNEL web site:

https://dafne-light.lnf.infn.it/users-2/researchers/access-safety-and-infos/

- 3) On the first day of access of the current shift at the DAFNEL facility after having verified the access formalities, Users **must** follow a short safety briefing strictly related with the activity they will perform.
- 4) The USERS working at the DAFNEL facility will be coordinate by a single responsible person (the "*Main Proposer*"). The *Main Proposer* is designed at the stage of the beam time request and will also take care of the transmission of the required documents for the access formalities.
- 5) Any activity should be performed by at least two persons.
- 6) Technical support will be provided during the experimental runs.
- 7) Any person noticing a fire must immediately call the internal phone number 5555.

b) **Operations**

1) Information on the operation of the beamlines and more in general of the facility is given to the Users by the beamline contact person.

III Possible risks at the DAFNEL Facility

1. Video terminal activities

- Working at DAFNEL implies the use of video terminals with an average use higher than 20 hours/week (A8 in Annex 2 – Information on Risks).

2. Magnetic fields

- In the laboratory there are many ion pumps. At about 0.5 m from the ion pumps a static magnetic field of 0.5 Gauss was measured. Pacemaker users or other with magnetic implants should not exceed 0.5 mT (5 gauss) at any time (A4_4.6 in Annex 2 – Information on Risks).

3. Use of UV-Vis sources

- Only for UV users since ultraviolet radiation is dangerous to eyes and skin, indicated safety equipment must be used (A4_4.4 in Annex 2 - Information on Risks).

4. Use of IR sources

- Only for IR users, no problem foreseen since low power INFRARED radiation source are used (P < 1mW) (A4_4.2 in Annex 2 – Information on Risks).

5. Gas system

- 1) The DAFNEL Bldg.13 laboratory is equipped with gas distribution system, with a dedicated bottle box closed by a key, located outside the building, from where four gas lines start from a distribution panel with pressure reduction.
- 2) The use, movement, installation and storage of the bottles must be done by the technical staff strictly following the rules for operation of gas under pressure.

6. DAQ and electronics

- 1) Use of any electronics device or equipment belonging to the DAFNEL (crate, rack, DAQ, solder, tester, scope, etc.) must be agreed with DAFNEL staff.
- 2) It is forbidden to move or change any of the DAFNEL equipment and devices without having agreed that with the DAFNEL staff.
- 3) Experimental groups are responsible for the damage caused to DAFNEL equipment.
- 4) Use of electronics devices is subject to general risks (A3 in Annex 2 Information on Risks).

7. Crane

1) Use of the crane for any operation on the experimental setups is allowed only to authorized personnel, holding the proper documentation for that.

8. Installation of experimental setups

- 1) The installation of the experimental setup and relative mechanical and electronics equipment should be complaint to the safety rules and laws.
- 2) It is forbidden to connect any mechanical or electronics to the DAFNEL equipment, except the cabling and the connections indicated by the DAFNEL staff. If the experimental setup foresees a connection to the vacuum pipe or the DAFNEL plant, that should be agreed and authorized by the DAFNEL responsible, who shall give the prescriptions for the installation and operations.
- 3) The installation should be performed taking care of minimizing the risks (A1 in Annex 2 Information on Risks).

9. Shielding

1) It is strictly forbidden to alter or move shielding.

10. Search procedure DXR1 and DXR2 Beamlines

Access and activities at the DAFNEL facility follows the Internal Rules for Radioprotection during the operations of the DAΦNE Complex.

In particular:

- 1) The search procedure (RONDA) for the DXR1 and DXR2 beamlines is performed by pressing with the correct sequence and timing, the green coloured button. In order to avoid stumbling upon all the passages and the space around the search buttons must be left free.
- 2) The search procedure must be performed by one person: as soon as the button is pushed a flashing light will signal it.
- 4) The entrance door of the experimental hutch must be closed and the key removed. The small key attached to the door key must be inserted in the control panel installed on the control room and turned to the run position. The key led will stay green.
- 5) Information on the beam can be asked for to the DA Φ NE control room (by phone, 2400).

11. Emergency buttons DXR1 and DXR2 Beamlines

- 1) The DXR1 and DXR2 Beamlines hutches are equipped with red emergency button that cause the immediate turning off of the LINAC.
- 2) Those buttons must be used only when strictly necessary.

12. Electrical risks

- 1) Use of mains, power racks and distribution both in the DAFNEL control room and experimental area must be agreed with the DAFNEL staff.
- 2) Use of electrical racks and distribution must be done following the relative safety rules.
- 3) It is forbidden to use the bus bars.
- Users RE exposed to general risk for what concerns electrical devices (A3 in Annex 2 Information on Risks).

13. HV supply

The DAFNEL laboratory is equipped with HV supplies for experimental apparata and detectors, remotely controlled. They must be used observing the safety rules for cabling, connections and operation, exposing to a normal risk (A3 in Annex 2 - Information on Risks).

14. Other equipment, hardware, tools.

- 1) The DAFNEL laboratory is equipped with general purpose tools, signal cables (LEMO, BNC), HV cables, extensions, adapters (of different kinds, BNC, LEMO, T, etc.); users are responsible for the correct use of all the tools and cablings.
- 2) Users must place all tools correctly and avoid magnetic or electrical interference.

15. Solvents, chemical agents, alcohol, radioactive sources, etc.

- 1) It is forbidden to use any solvent or chemical agent. If necessary, the use must be agreed and authorized by the **U.F. Prevenzione e Protezione** (Safety - <u>http://www.lnf.infn.it/lnfadmin/safety/</u>) of the LNF.
- 2) It is forbidden to use any radioactive source. If necessary, the use must be agreed and authorized by the **I'U.F. Fisica sanitaria** (Radiation Safety http://www.lnf.infn.it/lnfadmin/radiation/) of the LNF.