

The General Services and Technical Division

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** have left the Division (retirement or transfer)*

1 Introduction

The main task of the Technical Division is the facility management of the Frascati Laboratories but, at the same time, the Division must guarantee all the necessary support to research and accelerator activities, mainly in the field of mechanics, electrical systems and HVAC systems. The Division can also supply technical and scientific support in the fields of vacuum and diagnostics systems, magnets and power electronics for accelerating machines.

During 2012, the Division collaborated, supported and gave consultancies with many INFN activities, such as: AMADEUS, BES III, CCR, CED TIER2, CNAO, CUORE, DAFNE, ETRUSCO2, ICARUS, JEM-EUSO, KAONNIS, KLOE2, LHCb, MOONLIGHT, NA62, PLASMON-X, SIDDHARTA, SPACEWEATHER, SPARC-LAB, SUPER B, TPS, VIP2. In addition, the Division supplied technical assistance to the INFN Headquarters in Rome and prepared all the infrastructures necessary for the operation of the new LNF canteen, as described below.

2 General Services Dept.

The General Services Dept. of the LNF deals with the organization and management of the general operational activities of the LNF and the Central Administration of the INFN, such as:

1. ENEA Canteen + Bar/Canteen LNF
2. Cleaning Service
3. Guards Service
4. Gardening Service
5. Porterage
6. Purchase of new furniture and reuse of discarded furniture
7. Child care center
8. Buses
9. Coffee breaks and lunches
10. Deratization and pest control
11. Purchase of hygienic materials and rental of no-dust carpets
12. Purchase and cleaning of work clothes
13. Drink water dispensers rental
14. Microbiological analyses of LNF bar food & equipment
15. Lease, insurances, maintenance and documentation of LNF vehicles
16. Emission of badges for staff & guests of LNF & AC and several other INFN structures
17. Liaising with the City of Frascati for licenses, authorizations and taxes
18. Liaising with the ENEA Frascati Center.

In addition to routine activities, the Service has dealt with public tender procedures such as:

- Management of LNF bar and canteen;
- Transport facilities for personnel (ENEA coaches, LNF shuttles);
- Purchase of equipment and furniture for the new Canteen of LNF.

In 2012, the portering service was required for several heavy jobs: the dismantling and removal of about 10 temporary office buildings used by the SPARC Group, transfer of the SIDS Group (Research Division) to another building, collaboration with the Communication Office of the Rome Head Quarters for transport and stocking of exhibition material, emptying of 3 apartments necessary to the renovation of the roof of the external guest house Villa Laura, emptying of the ground floor of the Computing Building in preparation of the renovation works on its AC plants, disposal of discarded electronic equipment.

Collaboration with the Research Groups in the organization of meetings and conferences – coffee breaks, lunches, conference room preparation, participants transport (*Summer Internships, Spring School, Researchers' Night, Channeling 2012, SuperB, Incontri di Fisica, NN2012, HiLumi, BRML etc.*).

Procedures for the separate collection of rubbish as per Frascati municipality by-law have been instituted.

The extraordinary weather conditions in February with exceptionally heavy snow fall, which forced the LNF to close activities, put a heavy demand on facility management services.



The General Services Dept. of the LNF consists of two persons: the Dept. Head and one collaborator. Retirement of the Head is due at January 1st, of 2013.

The budget managed by the Dept. in 2012 was about € 293.000.

3 Central Stores and Purchasing Dept.

The Central Stores and Purchasing Dept. supervises the purchasing and stocking of goods of the Central Stores as well as those of the Metal Stores, and incoming and outgoing articles; development and extension of the stocked articles.

Moreover, the Dept. carries out market researches upon request of the users for the extension and upgrade of the collection of stocked goods, and maintains quality standards of stocked articles, and performs maintenance and updating of web pages, including the online General Catalogue database for the general users.

During the 2012 accounting period the Central Stores and Purchasing Dept. has transferred a total amount of € 200.000,00 for stock materials replenishment as follows:

- € 48.500,00 on Cap. 130110 (standard consumables),
- € 151.500,00 on Cap. 130120 (research consumables).

Furthermore, the Dept. has spent approx. € 84.500,00 for its ordinary activities, including mail handling services and management of small services such as the fork lift and small office equipment.

4 Building Management Dept.

In the course of the year, the porter lodge and entrance gate have been transferred to the new entrance area after fencing and landscaping in the area of the new entrance to the LNF and the adjoining service buildings has been completed.

The tender regarding the renovation of the roof of the Villa Laura guest house has been awarded and the related works are under way.

The executive project for the connection of the LNF sewage system to the communal sewage system, which runs under Via E. Fermi, has been completed. The tender for the works will be started as soon as the INFN will authorize the related public tender.

The executive project for the renovation of the roof of the ADONE guest house has been completed, and the contract has been awarded. The related works are under way.

Twelve prefab offices have been purchased and positioned in the area destined to new LNF research activities.



During the year, routine maintenance and repairs as well as extraordinary maintenance has been executed on the LNF buildings in order to preserve the value of the LNF assets. Other repair and maintenance works involving modifications, adaptations and renovations on LNF buildings have been carried out upon requests of the various LNF experimental groups.

The budget managed by the Dept. in 2012 was almost €300.000.

5 Mechanical Design and Construction Dept.

The Mechanics Design and Construction Dept. (SPCM) consists of five Units: Mechanical Design, Carpentry and Soldering, Machine Shop, Metrology and Alignment, Material Store.

During 2012, the SPCM personnel lost some staff units due to retirements, with no subsequent hiring of new resources; Metrology and Material Store in particular suffered lack of personnel and only for the latter internal resources have been found in SPCM; Metrology instead had to stop its activities in June.

The SPCM performs the following tasks:

- Mechanical design of experimental apparatuses and detectors, using CAD/CAE software and FEM analysis;
- Construction of prototypes and structures with the support of various soldering techniques and numeric control machine tools;
- Production of high precision mechanical components, relying on manual and numeric control machine tools equipped with CAM control;
- High precision dimensional check, material strength test, large structures and apparatus optical alignment;
- Acquisition and storing of mechanical components, tooling, metallic and plastic materials of workshop common use.

During the year, the SPCM has supplied support to several experimental activities, playing a role of direct responsibility in the design, production, construction or installation: CUORE at LNGS (engineering coordination and integration of the whole experimental apparatus), JEM-EUSO to be installed aboard the International Space Station (photo detector module and focal surface mechanics), SPACEWEATHER to be placed aboard a space satellite (structural design, optimization and analysis).

Many other activities were supported as well, though with no direct involvement in terms of responsibility: ATLAS, ETRUSCO2, JLAB12, KAONNIS, KLOE2, MAMBO, NA62, NESCOFI@BTF, NTA-SL-EXIN, UA9, VIP2 were supported in terms of mechanical design, construction, or dimensional checks and functional tests.

In conclusion, some 40 short-term actions were taken by the SPCM personnel to support experimental activities, in case of unplanned interventions or urgent repairs.

The budget managed by the Dept. in 2012 was about €63.000.



CUORE: Suspension test @LNGS



CUORE: installation of cryostat Outer Vacuum Vessel @LNGS

6 Heating, Ventilation and Air Conditioning Dept.

The Dept. is in charge of the operation and maintenance of the auxiliary plants, such as water cooling plants, water treatment facilities, compressed air and other gases production and distribution systems, HVAC plants for accelerators and experimental halls.

As of the end of 2012, the Dept. is also in charge of the HVAC Building Management (civil plants).

The procurements for new installations, from technical specifications definition to the follow-up of tender procedures, construction, commissioning, start-up, performance tests and standard operations, constitute part of the work scope of the Dept.

In 2012, the Dept. has provided support to DAFNE, KLOE, BTF, SPARC, FLAME, DAFNE-LUCE, MUEXC and the LNF Data Center.

During the year, the works for the upgrade of the Frascati Data Center air conditioning system started. The tender for the revamping of the SPARC supervisory and control system for Cooling and HVAC plants was awarded and the related works started. The Dept. also collaborated with the Electrical Installation Dept. in the tender for revamping of the PLCs system for the management of the Fluid Plants related to the DAFNE accelerator complex.

The budget managed by the Dept. in 2012 was about € 383.500,00.

7 Electrical Installations Dept.

The Dept. manages the LNF electrical installations from the high voltage power supply to end users and the lighting. The 150 kV main station and the eight secondary cabins are operated by staff, who also cover emergency calls and fault fixing. Routine safety and functional maintenance activities are usually performed by external operators under the Dept.'s supervision.

Maintenance involves several skilled scheduled activities on electric switchboards, transformers, medium voltage devices, safety lighting, UPS, emergency generating sets and electrical devices of the DAFNE and SPARC cooling systems, but also small repairs or changes requested by users.

The Department also supplies technical support to the INFN Rome Headquarters offices' installations.

During the year, the renovation of the old electrical installation supervisor and control system of the electric distribution network started. The HV main station and the eight secondary cabins are now under control of new PLCs and a new control system. Several new, cheap and efficient energy analysers have been installed in key points of the lab enabling a better knowledge of power demand so as to optimize energy saving activities.

The renovation and resizing of the outdoor lighting system is almost completed, resulting in a 40% power demand reduction.

The preliminary design and the costing of SuperB and ELI-NP electrical installation have been studied.

The VoIP upgrade of the telephone switchboard has been technically developed in cooperation with the LNF Computing Service, the work will be completed next year.

Several HV & MV maintenance activities have been performed contemporary to the general power cut required by Enel during the winter holidays.

The Dept. was also involved in the definition of the energy supplier contract with contacts with public utility companies and central INFN offices. A total of 31,7 GWh were registered by LNF in 2012, with a cost of 5,7 M€. The average energy cost was of about 0,18 €/kWh.

The budget managed by the Dept. was about €253.000.

8 Other technical-scientific support activities

A lot of work was done on the INFN flag-project Super B in collaboration with the Consortium Laboratorio Nicola Cabibbo. Over the summer, many graduates were selected through selection procedures, who were engaged by the Consortium mainly at the end of the year. From the technical point of view, the Departments of the Technical Division contributed to the preliminary design and the costing evaluation of the project. The following technical areas were covered: conventional magnets, vacuum systems, electric plant and distribution, fire systems and conventional safeties systems, and finally the interface with the Tor Vergata University deputed firm on civil engineering and the general coordination of the full WBS (Work Breakdown Structure). More in particular, a preliminary design of the vacuum system of the SuperB machine complex has been carried out going in detail with LINAC, Transfer Lines, Damping Ring and Main Rings vacuum system.

The technical support activity for AMADEUS & SIDDHARTA also continued: the activities related to the realization of the new setup for the upgrade of SIDDHARTA - SIDDHARTA-2 - are currently in progress. Regarding AMADEUS, in August a carbon target has been inserted inside

the KLOE detector to enable the study of kaon-nuclei interaction using the KLOE detector capabilities. The activities related to VIP experiment proceeded with the realization of an aluminium box that will enclose the experimental setup keeping it under vacuum. Moreover, some other activities related to the VIP experimental area, located in Laboratori Nazionali del Gran Sasso, have been carried out.

Last but not least, a member of Division Staff has tutored a bachelor student in the elaboration of his thesis, titled *Deposizione film sottile di TiN su Allumina sinterizzata per ridurre l'emissione secondaria*. The student subsequently obtained his bachelor's degree with honours.

The Division Staff personnel also supported the Division Head with regard to civil engineering projects executed by specialized firms.

Two particular tenders have been dealt with by Division Staff: one for the refurbishment on the premises of the new LNF Canteen, awarded on 30/05/2011, and concluded on 04/04/2012, and another for the supply of furniture and utensils for the new LNF Canteen, awarded on 13/09/2011, and concluded on 01/08/2012 with final commissioning.

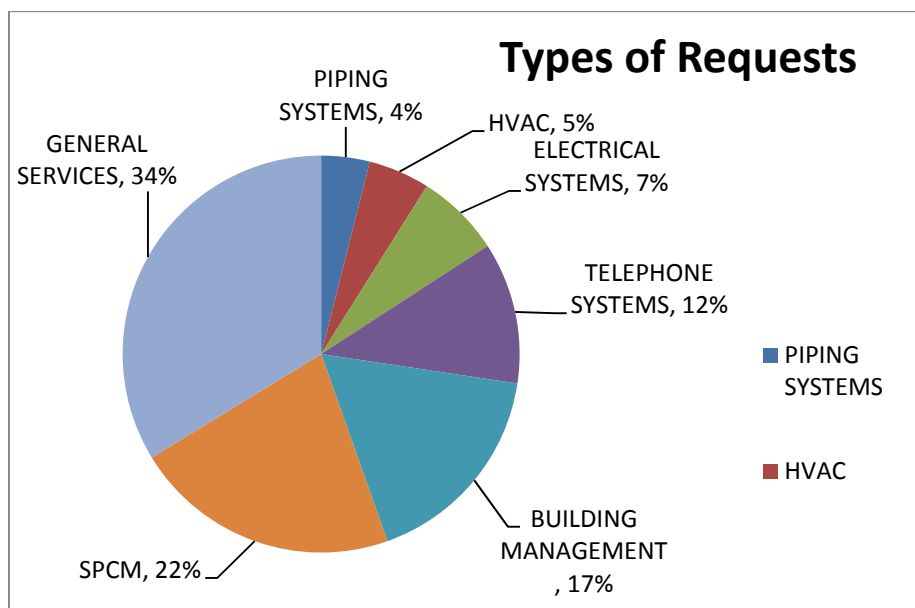
Unfortunately, a third tender for the selection of the catering firm for the new canteen dealt with by the General Services Dept. was stopped due to the "Spending Review" Law, which imposed the diminution of the value of the meals to be dispensed, changing hereby the essential terms of the tender. A new tender was called which will be concluded in 2013.

9 Some Statistics

During 2012, a total number of 581 registered requests reached the Technical and General Services Division, either through the General Users [Form](#) or through an automatic mail system for conference support requests. Not included in this number are the scheduled maintenance activities on the research and general facilities of the LNF, the mail requests for illumination repairs and those for change of tenocodes, or the 6 jobs executed by the Electrical Systems Dept. on request of the INFN Head Quarters in Rome.

The following departments were involved in the requests:

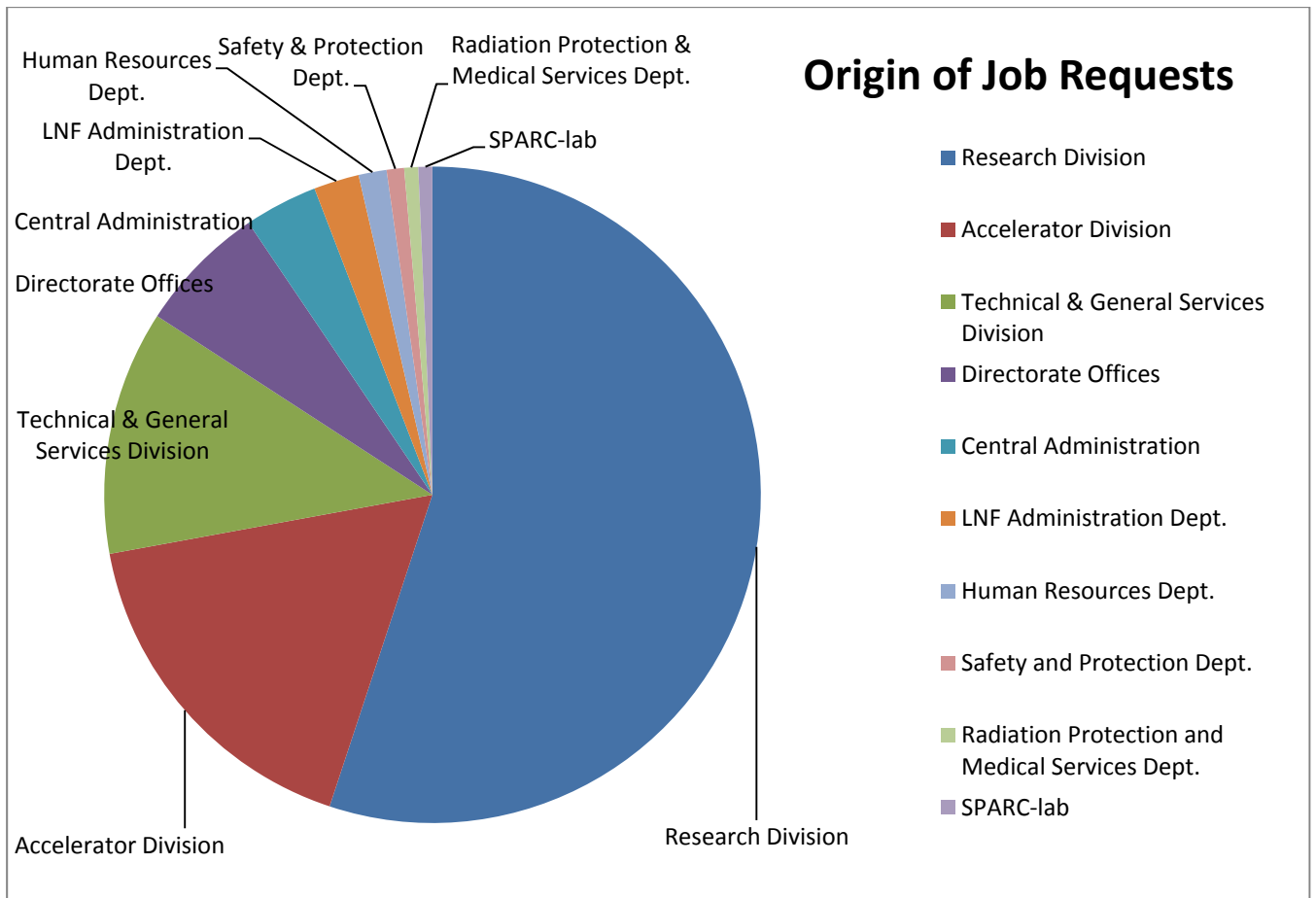
DEPT.	%	Q.TY
PIPING SYSTEMS	4%	23
HVAC	5%	29
ELECTRICAL SYSTEMS	7%	40
TELEPHONE SYSTEMS	12%	67
BUILDING MANAGEMENT	17%	100
SPCM	22%	126
GENERAL SERVICES	34%	196
TOTAL TD 2012	100%	581



Compared to the previous year, 2011, the amount of requests handled by the Division has diminished by about 10% (581 in 2012, against 640 in 2011), but the Division staff has suffered a loss of 6 units due to retirement, 3 due to relocation within the LNF, and 2 for other reasons, for a total of 11 out of 49, i.e. more than one fifth of the work force. Two more people will be retired at the beginning of the next year.

More than half of all requests (55%) were from the Research Division, second and third requesters were the Accelerator (17%) and the Technical (12%) Divisions:

ORIGIN OF JOB REQUESTS	%	Q.TY
Research Division	55,08%	320
Accelerator Division	17,04%	99
Technical and General Services Division	12,05%	70
Directorate Offices	6,37%	30
Central Administration	3,61%	21
LNF Administration Dept.	2,24%	13
Human Resources Dept.	1,38%	8
Safety and Protection Dept.	0,86%	5
Radiation Protection and Medical Services Dept.	0,69%	1
SPARC-lab	0,69%	4
TOTAL TD	100%	581



The average time of job completion was 39 days. However, since job completion often depends on external factors, one should not interpret the below graphic as an indication of efficiency. And again, scheduled maintenance on research and general facilities has not been included in the statistics.

AVERAGE TIME OF JOB COMPLETION	
DEPT.	DAYS
SPCM	17
Telephone Systems	28
General Services	36
Electrical Systems	44
Building Management	52
HVAC	87
Piping Systems	105
Overall	39

