

Deliverable 4.5: Report on CF human capital building

Authors: ACTRIS Central Facilities

Doina Nicolae (INOE, CARS leader), Eija Juurola (FMI, HO), Edith Rodriguez (FMI, HO), Cathrine Lund Myhre (NILU, DC leader), Martial Haeffelin (CNRS, CCRES leader), Martine de Maziere (BIRA, CREGARS leader), Alfred Wiedensohler (TROPOS, ECAC/CAIS leader), Kristina Höhler (KIT, CIS leader), Ralf Tillmann (FZJ, CiGas leader)

Work package no	WP4
Deliverable no.	D4.5
Lead beneficiary	INOE
Deliverable type	<input checked="" type="checkbox"/> R (Document, report) <input type="checkbox"/> DEC (Websites, patent filings, videos, etc.) <input type="checkbox"/> OTHER: please specify
Dissemination level	<input checked="" type="checkbox"/> PU (public) <input type="checkbox"/> CO (confidential, only for members of the Consortium, incl. Commission)
Estimated delivery date	M46
Actual delivery date	03/10/2023
Version	Final
Reviewed by	Pirjo Kontkanen, Stefan Reimann
Accepted by	Niku Kivekäs
Comments	

Contents

Purpose of the document.....	3
List of acronyms.....	3
1. Introduction.....	3
2. Baseline in ACTRIS IMP	4
2.1. ACTRIS strategy on human capital.....	4
2.2. ACTRIS CFs human capital at the start of the implementation phase	5
2.2. SWOT analysis	6
3. Actions during ACTRIS IMP	7
3.1. Recruitment of new personnel.....	7
3.2. Induction program	8
3.3. Motivation.....	10
3.4. Training.....	11
4. Conclusions and way forward	14
Reference documents	14

Purpose of the document

This report is prepared in the context of the activities of the ACTRIS IMP (Aerosols, Clouds and Trace Gases Research Infrastructure Implementation) project. The document presents the progress made by the ACTRIS Central Facilities in developing their human capital.

List of acronyms

ACTRIS – Aerosol, Clouds and Trace gases Research Infrastructure

ACTRIS-PPP – ACTRIS Preparatory Phase Project

ACTRIS IMP – ACTRIS Implementation Project

CARS – Centre for Aerosol Remote Sensing

CCRES – Centre for Cloud Remote Sensing

CF – Central Facility

CiGas – Centre for Reactive Trace Gases In-Situ Measurements

CIS – Centre for Cloud In-Situ Measurements

CREGARS – Centre for Reactive Trace Gases Remote Sensing

DC – Data Centre

ECAC – Centre for Aerosol In-Situ Measurements

FTE – full-time equivalent

HO – Head Office

KPI – Key Performance Indicators

MB – Management Board

NF – National Facility

QA – Quality Assurance

QC – Quality Control

RI – Research Infrastructure

SAMU – Service and Access Management Unit

SOP – Standard Operation Procedure

TC – Topical Centre

1. Introduction

The ACTRIS IMP project aims to provide assistance in the execution of the organizational, operational, and strategic structures of ACTRIS. Work Package 4 pertains to the examination of the functionalities exhibited by the ACTRIS Central Facilities, which are dispersed across Europe.

ACTRIS comprises a total of eight Central Facilities (CFs), which are instrumental in facilitating various research endeavours. Among these CFs, there are six Topical Centres (TCs) that specialize in specific areas

of study. Additionally, ACTRIS encompasses a Data Centre, which serves as a hub for managing and organizing research data, and a Head Office (HO). The Head Office includes the Service and Access Management Unit (SAMU), which plays a crucial role in coordinating and overseeing the provision of services and access to the infrastructure. Each CF is composed of multiple Units, overseen by various Research Performing Organizations (RPOs). WP4 focuses on the essential components required to effectively implement CF functionalities and facilitate their operation. These components include the internal structure of CFs as collaborative entities spanning across Europe, the establishment of streamlined processes between TCs, DC, and National Facilities (NFs), the adaptation of CF implementation plans to align with the development of ACTRIS at both national and European levels, and the thorough testing of TCs and DC to ensure optimal functionality. The interdependence of all four elements is contingent upon the utilization of human resources at the Central Facilities. Consequently, the strategic preparation of teams assumes a pivotal role in WP4.

Within the framework of the ACTRIS-PPP, the collaborating entities have formulated an action plan aimed at enhancing their human resources in a manner that encompasses both quantitative and qualitative aspects. The action plan for CF human capital building is elaborated upon in [MS4.4](#), providing a comprehensive description. The process encompasses the recruitment of new personnel, the execution of appropriate induction programs and motivation strategies, as well as the provision of managerial and technical training for all members of the team. The majority of these measures exhibit dependence on the institution, thus necessitating distinct approaches at the level of each CF Unit. Nevertheless, overarching suggestions and commendable methodologies have been deliberated and disseminated within the Units during community gatherings, RI Committee and CF leaders' meetings.

2. Baseline in ACTRIS IMP

2.1. ACTRIS strategy on human capital

As expressed in its human capital strategy, ACTRIS shall be guided by the following core values:

- Equality - All people are treated in a fair manner and they have equal opportunity to achieve their goals in work.
- Transparency - Decisions are made based on clear, openly stated procedures and criteria. The outcomes with justifications are accessible to all ACTRIS people. Personal privacy shall, however, be respected.
- Commitment and loyalty - People should be committed to the work they are performing for ACTRIS and think the best of ACTRIS.
- Reliability - ACTRIS should be able to rely on people to perform their duties well and follow any policies and rules accepted for ACTRIS.
- Work-life Balance - Work and life of people should be in balance.

These aspects are relevant from the moment of the announcement of the job position, and shall be applied across the entire employment duration. The Units of the ACTRIS CFs shall implement recruitment, induction, motivation and training measures such as the core values are fulfilled.

2.2. ACTRIS CFs human capital at the start of the implementation phase

ACTRIS CFs have been designed and planned already during ACTRIS-PPP. Institutions mandated to put in place the Units of the CFs have identified the key personnel out of the existing personnel. The situation at the beginning of the ACTRIS IMP project is presented in Figure 1.

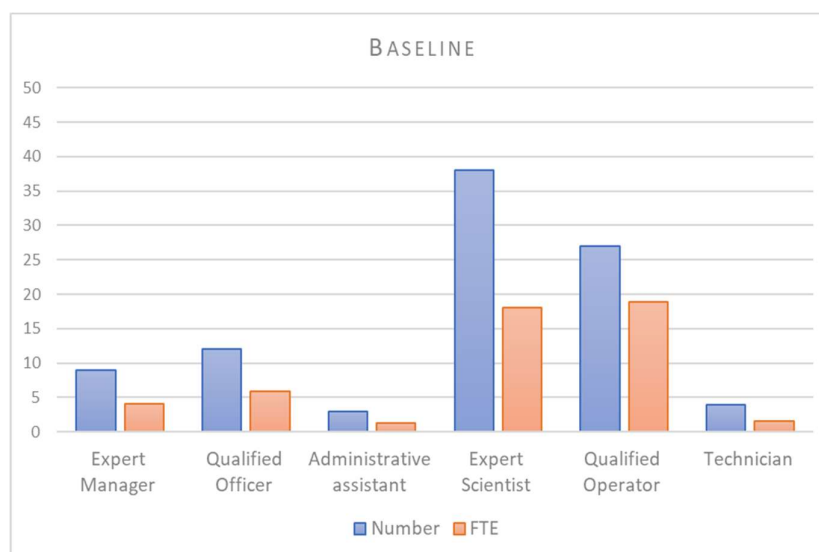


Figure 1. Number of personnel employed at the ACTRIS CFs at the beginning of ACTRIS IMP

With a total of 93 people distributed among the 56 institutions contributing to the CF Units, the human resources appear to be sufficient to ensure the smooth operation of the 112 National Facilities, as well as provision of services to users from private sector and/or international agencies. However, one can note that not all the staff members are involved fully in ACTRIS, summarizing a total of 50 full-time equivalent (FTEs) only. Moreover, the number and the FTEs for the qualified operators and technicians are unacceptably low considering, among other, that the TCs are supposed to ensure calibration of all instruments.

One particular need that was identified during ACTRIS IMP refers to managers. Although the majority of managerial tasks can be pursued by expert scientists, in some cases (e.g. leadership of CFs) specific expertise / professional qualifications are necessary.

Also, some of the staff members are getting closer to retirement and will soon have to be replaced. Passing the experience to the next generation may take time, therefore recruitment of additional / compensating personnel must start early.

2.2. SWOT analysis

Understanding the gap between current and desired state helps in developing human capital goals which would not only increase the overall efficiency of employees but also make them feel attached towards the organization.

At the beginning of ACTRIS IMP, ACTRIS has identified the following strengths, weaknesses, opportunities and threats applicable to its core team (CFs):

Strengths	Weaknesses
<ul style="list-style-type: none"> ● Key personnel at each CF Unit already existing; ● Large, diverse and engaged ACTRIS community for mentoring young scientists; ● Consolidated community expertise (>30 years of experience of the participating networks); ● Existing pool for hiring young talents (universities with dedicated programs in ACTRIS domain); ● ACTRIS policies in place (employment, financial rules, data, ICT, access and services, etc.) ● Known mandate and implementation plans for the CFs. 	<ul style="list-style-type: none"> ● Insufficient technical staff to cover all necessary tasks; ● Lack of dedicated administrative personnel; ● Insufficient experience and number of people to manage RI specific activities; ● Insufficient uptake of the ICT technology to facilitate remote work (inside each team and between teams).
Opportunities	Threats
<ul style="list-style-type: none"> ● ACTRIS ERIC in place; ● Guaranteed sustainability, good perspective for long term careers; ● Highly instrumented facilities, good working conditions; ● Already established framework for cross-institutional training (community workshops, meetings, conferences, summer and winter schools); ● Exceptional international connections and global collaboration perspectives. 	<ul style="list-style-type: none"> ● Continuously evolving landscape in ACTRIS, leading to more CF tasks; ● Unavoidable change of personnel due to retirement and mobility; ● Long time needed for building the required expertise (years) for the new employees; ● Decreasing interest of young generations towards science; ● Geopolitical and global economic threats.

The following goals have been set in order to reduce the weaknesses while keeping the strengths, taking advantage of the opportunities but also minimizing the impact of the threats:

- Only the best suited talent should be hired.
- Developing realistic induction programs for new employees.
- Continuously develop skills of workforce in line with the requirements.
- Retaining hard working and dedicated employees.

3. Actions during ACTRIS IMP

3.1. Recruitment of new personnel

With the start of the implementation phase, countries adhering to ACTRIS have started to invest in people and infrastructure. The ACTRIS recruitment policy has been drawn in order to regulate and homogenize as possible the recruitment process and the induction programs. According to this policy:

All recruitment procedures must adhere to globally recognized labour standards, as well as any national laws, regulations, collective agreements, industry norms, and country customs. National legislation will always take primacy. European and national regulations governing the protection of personal data and privacy, as well as occupational health and safety, must be followed.

In practice, advertisement of the job positions is always done using ACTRIS mailing lists, but in addition the institutions use their specific channels: website, journals, own mailing lists. The selection procedures are institution and position specific, starting from a simple screening based on an extended CV, to written exams, interviews, practical tests and combination of those. An overview of what has been organized during ACTRIS IMP is provided in Figure 2.

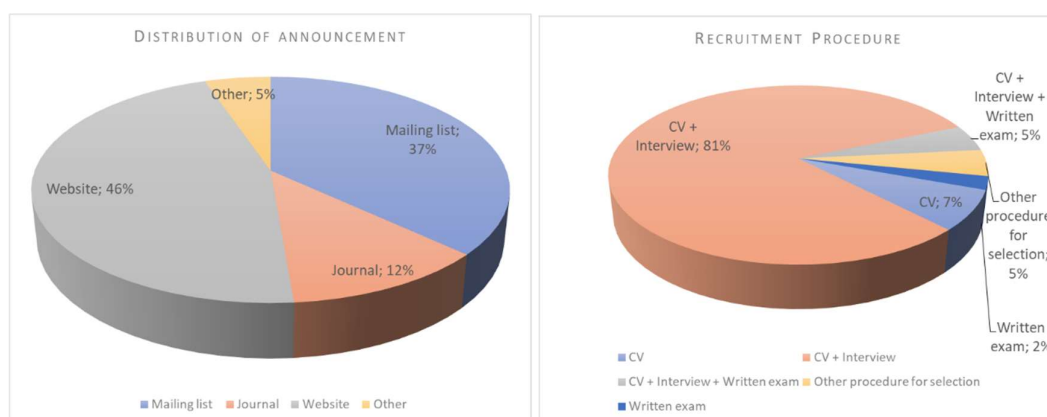


Figure 2. Methods to advertise job position applied by the ACTRIS CFs (left panel) and the selection procedures (right panel).

One can note that the most popular selection procedure by far is the combination of CV screening and interview. Written exams and other procedures (practical exams) are generally applicable to qualified operators and technicians.

Many of the open positions were dedicated to ACTRIS as full-time jobs (18 positions out of 43). However, part time jobs were also offered considering that, at the same institution, a person will be involved also in activities not related to the ACTRIS CF. It is especially the case for administrative assistants and expert managers. On the contrary, expert scientists, qualified operators and technicians were offered full-time positions (or close to), since their tasks are specific to ACTRIS instruments and knowledge: QA/QC, data, innovation, development, operation and maintenance. The increase of the number of personnel and the change of the average FTE per position during ACTRIS IMP are shown in Figure 3.

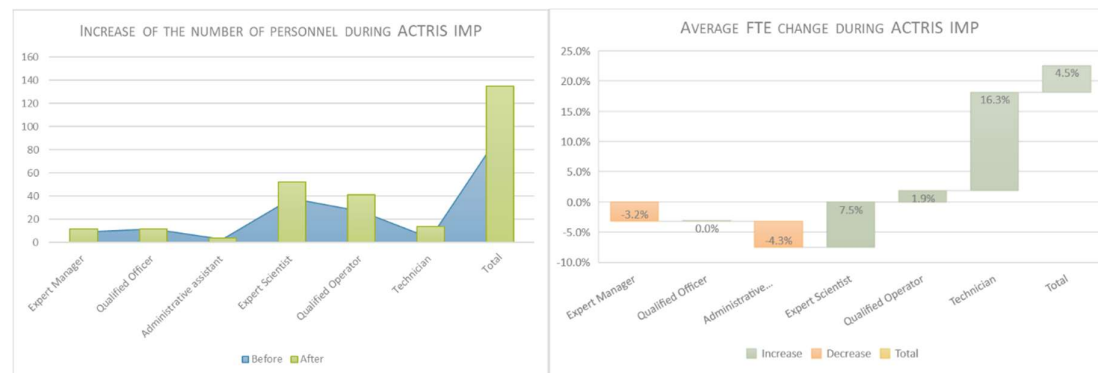


Figure 3. Evolution of the number of personnel (left panel) and the change of average FTE per position (right panel) during ACTRIS IMP

One can note that, although for the majority of the positions the average FTE has increased (demonstrating more commitment for ACTRIS), the average FTE for Expert Managers and Administrative Assistant has slightly decreased. Paradoxically this is not a negative aspect. First of all, the work at the ACTRIS Central Facility is largely scientific and technical, therefore even for the management of the Units it is advisable that the manager has technical and scientific background, reason for which Expert Scientists are preferred. Expert Scientists do have management experience because they are generally leading teams and projects. Second, the decrease of the average FTE associated to the Expert Manager and Administrative Assistant positions is related to more engagement in the process of the administrative offices of the institutions, which have put at the disposal of ACTRIS teams part time of the existing administrative personnel. These persons have other duties but they serve ACTRIS CF Units as well, which is a positive aspect because they clearly have experience with administrative tasks and they are also the perfect link with the executive bodies at the institution level.

3.2. Induction program

ACTRIS CFs are unique in Europe and, by consequence, the technical background required for performing the work is difficult to find. Even though European Universities have programs to train the students in

atmospheric optics and atmospheric chemistry, rarely they tackle the very specific technicalities of the measurement techniques and algorithms used by ACTRIS. As a consequence, induction programs in place at the CF host institutions are crucial for: a) integrating new employees in the existing teams, and stimulating their commitment and loyalty towards ACTRIS; b) refine and increase their technical and scientific skills as necessary for the specific tasks at the ACTRIS CF Unit.

Induction programs for the new employees generally include the following measures:

- Introduction of the employee to the local team
- Introduction to the employee of the organisational history, structure, vision, culture and values
- Discussion of the employee with the team leader on the work allocated, job description
- Handing over the institution's rules and procedures to the employee
- Employee handbook briefing and reference to the code of conduct
- Provision of work health and safety information
- Induction and setup of the working environment (office, computer, badges, credentials for accessing the IT, etc.)
- Presentation of the surroundings (buildings, laboratories, etc.)
- Organisation of a special event with the local team (e.g. lunch, party, etc.)
- Nomination of a mentor from the team
- Introduction of the employee to the collaborators and stakeholders (via email or meetings)
- Presentation of the ACTRIS history, structure, vision, culture and values
- Invitation to the CF meetings and events

The most popular measures applied at the ACTRIS CF Units during the implementation phase are presented in Figure 4.

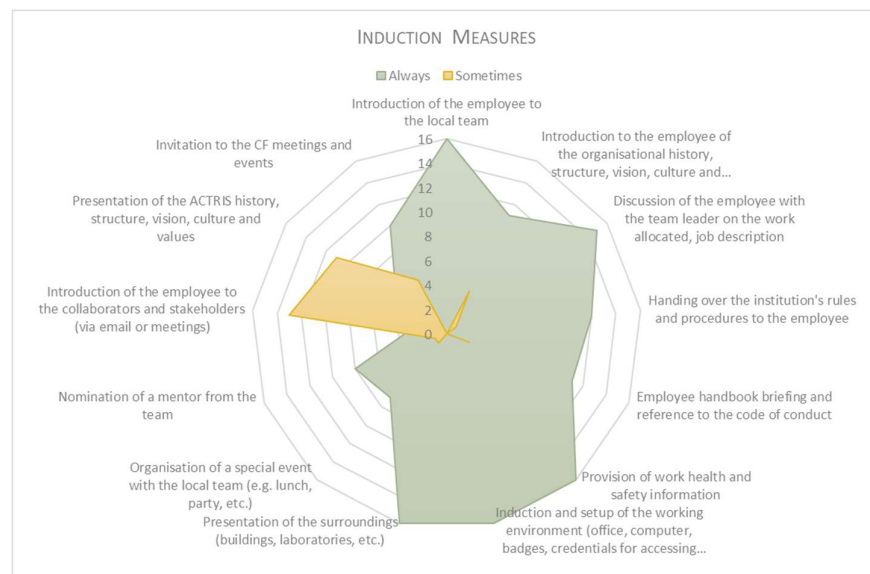


Figure 4. Most popular measures considered for the induction programs at the ACTRIS CFs.

It can be seen that induction measures differ from organisation to organisation, generally due to cultural and historical reasons. However, almost always include introduction of the employee to the local team, provision of work health and safety information, setup of the working environment (office, computer, badges, credentials for accessing the IT, etc.), presentation of the surroundings (buildings, laboratories, etc.), and discussion of the employee with the team leader on the work allocated. In addition, some CF Units nominate a mentor for the newly employee, and they introduce him/her to the other CF Units during meetings. Although in some organisations there is a practice to present the history, structure, vision, culture and values, our analysis shows that rarely this includes information about ACTRIS and its framework, even though the person is supposed to work for ACTRIS. Also, the person is presented to the local team but is rarely presented to the ACTRIS teams and stakeholders.

3.3. Motivation

Retaining the most talented and active people in ACTRIS is an important objective for building up a sustainable, experienced and committed human capital. This can only be achieved by a proper motivation of both the existing and the newly recruited personnel. In addition to the salary, motivation measures generally refer to: ensuring good working conditions, facilitating access to professional training courses and travel to conferences, allowing flexible working time and additional vacation days, and giving the correct recognition for personal work achievements.

When asked to identify the motivation actions applied at their CF Unit, very few CF Unit Heads have pointed out the salary (Figure 5). This is risky in an increasingly demanding market for highly qualified workforce, and could become a weakness for ACTRIS in the future. Young talents may not be convinced to join ACTRIS CF teams if the salary offered is not competitive.

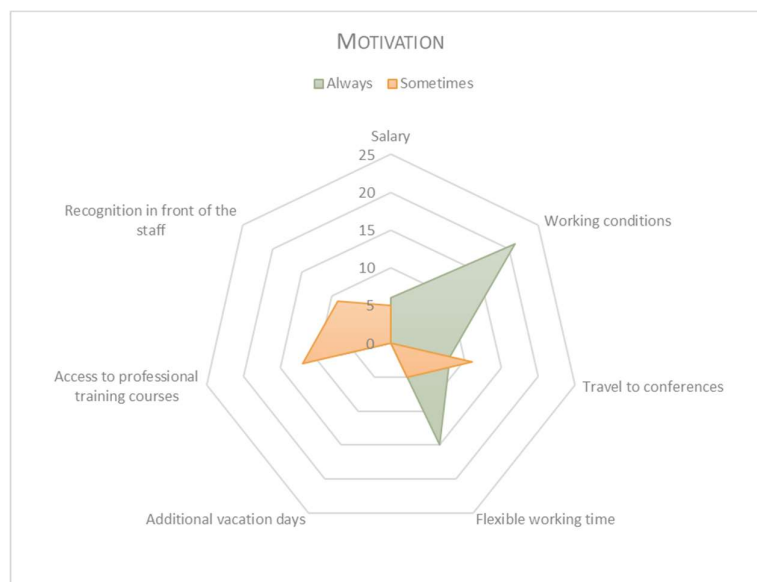


Figure 5. Methods in place at the ACTRIS CFs for motivating the personnel.

An encouraging aspect is that all CF Units offer good working conditions, many offer flexible working time (and sometimes additional vacation days), travel to conferences and access to professional training courses. Although recognition of achievements was not identified as a practice, we should clarify that scientific recognition is embedded into the research and innovation career in general, and here we only point out additional actions such as praise in front of the staff and/or acknowledgement in meetings and communications.

3.4. Training

As explained before, ACTRIS is profoundly technical and scientific, and its goal is to always stay at the forefront of top research and technology development. Therefore, its human capital must be continuously exposed to novelty. The term “training” may not be completely (or correctly) describing the actions pursued for increasing the know-how and the expertise of the CF Units team members, as learning occurs in many ways, even during face-to-face discussions, social events and laboratory work. Leaving the “non-classical” actions aside, the most common actions organised by the CFs for the associated personnel are presented in Figure 6.

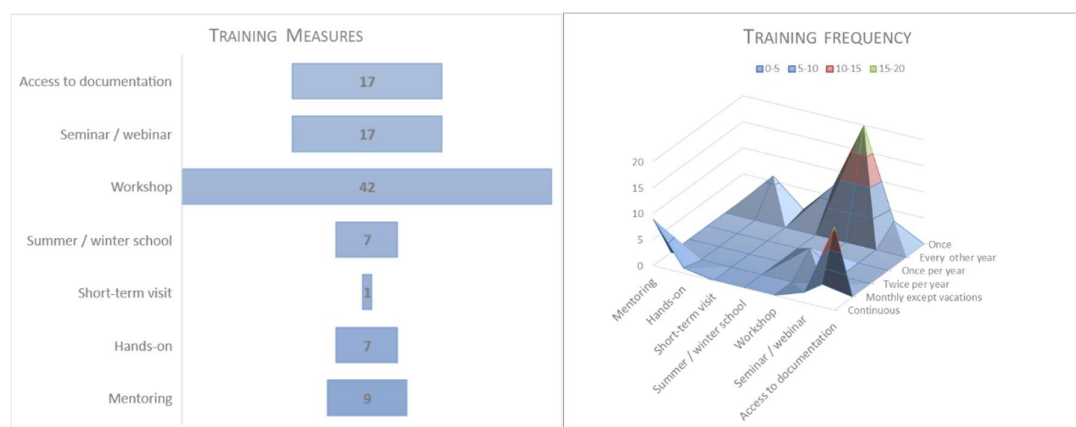


Figure 6. Training organized for the ACTRIS CF personnel.

Training takes place mostly through workshops, seminars and access to documentation, but hands-on training and mentoring are also important, especially in case of Qualified Operators and Technicians. As expected, access to documentation and mentoring are continuous, while the other activities span as frequency from twice per year up to every other year. Short-term visits are generally organised less frequently. The cost of the training seems to be the main parameter in deciding the frequency of provision. Access to documentation is cheap, therefore can be offered continuously, while participation in workshops, summer and winter schools and short-term visits involve travel which raises the cost, meaning that such opportunities cannot be offered too often because of the limited budget. Travel also removes people from their day-to-day work, which may impact the activity of the CF if not wisely planned.

The main training objectives, as identified during the implementation phase, are:

- To exchange experience with other RIs, international networks, programs and initiatives
- To improve leadership
- To learn about ACTRIS policies, rules and procedures
- To gain experience with instruments and associated tools
- To improve the knowledge on specific hardware/ software issues
- To gain experience related to the quality assurance procedures
- To share experience between CF staff

Figure 7 shows how the training measures contribute to the fulfilment of each of the objectives?. One can note that each objective is tackled through a variety of training actions, meaning that the CF teams have used the synergy to prepare their personnel from various perspectives. For example, the improvement of the leadership is done through dedicated workshops but also on a more regular basis through seminars and webinars. Gaining experience with the instruments and associated tools starts with accessing the related documentation but also involves hands-on training and is consolidated through technical events (workshops, summer schools, seminars). Short-term visits are largely used to gain experience on the quality assurance procedures but also to improve the knowledge on specific hardware/ software issues, and to share experience between CF staff. This is because, as explained above, the costs of such visits are significant, therefore the time spent must be optimised, so the focus must be on what cannot be covered at home.



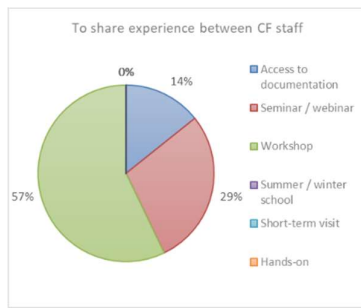


Figure 7. Objectives considered for the various types of training.

One particular case is referring to the exchange of experience with other RIs, international networks, programs and initiatives. This objective is achieved by a variety of actions, from workshops to short-term visits, documentation and participation to summer schools organised by external parties. It shows that ACTRIS CFs are not closed entities, and that the teams are very much aware of the general framework in which they activate, and they want to be connected and informed through all possible means.

It has to be noted that training activities involve a large portion of the CF personnel. In other words, new knowledge is spread across positions and team members, contributing to long-term sustainability (Figure 8).

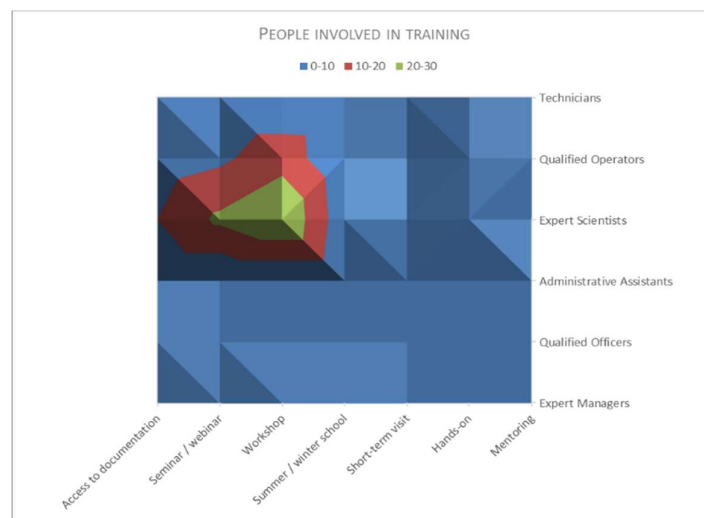


Figure 8. Number of ACTRIS CF personnel involved in the various training activities.

As expected, most of the trained personnel refers to technical positions (Technicians, Qualified Operators, even Expert Scientists), and the most used measures are access to documentation, seminars and workshops.

4. Conclusions and way forward

During the implementation phase of ACTRIS, the CF personnel has increased by 145% as number of people, and 157% as FTEs, demonstrating that the CF teams are now consolidated and the commitment to ACTRIS work is stronger. The larger increase refers to technical and scientific positions. In combination with the induction measures, and with the multitude of training activities involving a large proportion of the CF personnel, the extension of the CF teams was done at a proper scale to guarantee that CFs will be able to manage their operations as proposed in the CF implementation plans.

Three optimisation needs were identified during this exercise:

1. Induction programs should pay more consideration to introducing new employees to the ACTRIS framework, values and teams, in order to generate the feeling of belonging to the ACTRIS community and, by this, to increase commitment and loyalty towards ACTRIS work;
2. Salaries of the CF personnel should be reconsidered as to be competitive on the workforce market, in order to enable hiring the best talents and retaining the experienced personnel;
3. Training in team management and leadership should be organised with a proper frequency, not only for the managers but also for the expert scientists and team leaders, especially when transitioning from the implementation to operational phase, as the priorities and people may change.

Building up the human capital at ACTRIS CFs will continue. Although most of the recruitment for the implementation phase is finalised, motivation and training must be supported also during the operational phase. Many of the experienced scientists who worked for building up ACTRIS will retire in several years. Passing the knowledge to young (now) members of the teams is crucial for ACTRIS sustainability, considering that talented people are the most valuable resource in science and technology.

Last but not least, ACTRIS should find ways to stimulate the enthusiasm of its people, being known that enthusiasm can boost energy and generate good ideas. The human capital of ACTRIS is largely composed of scientists, who are passionate about science. Therefore, ACTRIS should create opportunities for community events where science and technology are at focus, and should create an internal framework for properly acknowledging its talented people.

Reference documents

ACTRIS human capital strategy

ACTRIS recruitment policy

[MS2.3 Plan for ACTRIS personnel training and human capital development](#)

[MS4.4 Action plan for CF human capital building](#)

[MS5.2 First series of NF thematic workshops on remote sensing, in-situ measurements and simulation chamber experiments performed](#)

[D8.4 Summary report on international ACTRIS training courses](#)