

Milestone 5.6: Majority of NFs labelled and operational

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1 ACTRIS National Facility labelling process

In ACTRIS, each National Facility (NF) is evaluated, and its performance monitored to make sure that the facility and the data and services it provides meet the ACTRIS requirements. The labelling consists of three steps (Step 1a-1c) described below and a periodic re-evaluation of the facility (Step 2) every five years. A more detailed description of the labelling process is provided in ACTRIS IMP D5.1 “ACTRIS NF labelling plan”

https://www.actris.eu/sites/default/files/Documents/ACTRIS%20IMP/Deliverables/ACTRIS%20IMP_WP5_D5.1_ACTRIS%20NF%20Labelling%20Plan.pdf.

Step 1a:

As the initial National Facilities have already been identified, this step is a general level feasibility check. Information on variables, instruments, and personnel are collected to the extent needed for identifying the main gaps in compliancy with the ACTRIS requirements, and to estimate the need of operation support by the TCs. The NFs are also asked to provide a plan how and when to reach compliancy, and the NF host organizations are asked to sign commitments of funding and of following the relevant ACTRIS policies. No audit is required at this stage, but a report from the respective TC whether it is feasible to make the NF compliant with ACTRIS requirements in a reasonable time (the maximum time to reach Step 1c is 5 years, so everything should be ready in max 3 years).

As the result of the Step 1a, the facility is in the pipeline for the label and under the support umbrella of the respective TCs.

Step 1b:

In this step, the facility is being upgraded to reach the compliancy. The data flows and operation support schedule are created, and a more thorough compliancy gap analysis made, including a potential audit. This is part of the quality assurance work of the TCs. The step also includes following of the NF performance, demonstrating that it can provide the requested data systematically (over two consecutive years).

As the result of Step 1b, the facility is compliant with ACTRIS requirements and has demonstrated its ability to perform its tasks.

Step 1c:

In this step, the full label is granted for the National Facility. The step starts when the NF is reported to have passed all the requirements of Step 1b, and the label is given through a General Assembly decision, based on a Research Infrastructure Committee recommendation. At this stage, the ERIC and the NF host organization sign an ERIC-NF agreement.

For the clarity of this document, it is important to note the difference between the following concepts:

- **Observational component** indicates the type of observations made an NF. In ACTRIS, there are six observational components: aerosol in-situ measurements (AIS), aerosol remote sensing (ARS), cloud in-situ measurements (CIS), cloud remote sensing (CRS), reactive trace gases in-situ measurements (RTGIS), and reactive trace gases remote sensing (RTGRS). For each observational component, there is a Topical Centre (TC) responsible for quality assurance of the respective instruments and data.
- **National Facility** (NF) is a measurement platform (or a combination of measurement platforms) proposed by the hosting country to be a facility providing ACTRIS data and services. The facilities can be either observational or exploratory (mobile platforms, laboratory, chambers).
- **National Facility component** is a set of measurements at a National Facility contributing to one observational component and meeting the ACTRIS requirements for that observational component.

For observational facilities the ACTRIS label is specific for each observational component, whereas for exploratory facilities the label is for the facility as a whole.

2 Labelling database and interface

In ACTRIS, the NF labelling takes place via an online tool, referred to here as the labelling interface, and the ACTRIS National Facility database <https://actris-nf-labelling.out.ocp.fmi.fi/>, both hosted and administered by the Head Office (HO). The database includes the general information and component-specific information of each National Facility in ACTRIS and is for any individual facility kept up to date by the principal investigator (PI) of the facility. The database is also connected to the NF maps at the ACTRIS website (<https://www.actris.eu/facilities/national-facilities>), and the same information can be accessed via the maps.

The labelling Step 1a consists of the following steps for an observational facility:

1. The country proposes the NF to be included in ACTRIS.
2. HO gives the facility PI access to the labelling interface.
3. The NF provides the general information on the existing or planned facility and more detailed information concerning the NF component to be labelled. These are inserted by the facility PI through the interface.
4. The respective TC interacts with the NF and performs an evaluation on the NF component to identify / confirm the current gaps in compliancy. The evaluation report is uploaded in the labelling interface.
5. The NF provides a plan how and when to reach compliancy with ACTRIS requirements. The plan is uploaded in the labelling interface.
6. The respective TC provides a report on the NF capability and plan with respect to the requirements and a recommendation whether the facility is ready for initial acceptance. The report is uploaded, and the recommendation provided in the labelling interface.

7. The NF host RPO(s) provide(s) a signed letter of confirmation for following the ACTRIS policies and providing long-term support for the facility / NF component, if not yet done. The commitment is uploaded in the labelling interface.
8. The HO performs a technical check that all required information and documents are provided. The check is done in the labelling interface.
9. The ACTRIS Research Infrastructure Committee evaluates the NF based on the information and recommendations provided and gives a recommendation for the Director General (DG) whether the facility is ready to be initially accepted. The recommendation is given in the labelling interface.
10. The DG gives the initial acceptance for the facility in the labelling interface.

For an exploratory facility the process is slightly different. That, and the processes for Steps 1b, 1c, and 2 are not yet implemented in the labelling interface.

3 Readiness of the labelling process

3.1 Observational facilities

The labelling process and interface were piloted in 2022-2023 with 15 experienced facilities consisting of 21 individual components representing all observational components of ACTRIS, except for cloud in-situ measurements (see details below). During and after the pilot phase, the process and labelling interface were modified to be more streamlined and to better fit the needs of ACTRIS. After the pilot, the process was opened to the rest of observational facilities in May 2023 (except for cloud in-situ components), following the schedule defined by the respective TC for each component. Later, the part where general information on the facility is provided was opened to all proposed NFs in October 2023.

3.2 Exploratory facilities

For exploratory facilities the process has been designed in 2023 but due to non-availability of suitable expertise at the HO, the interface for exploratory platforms has not been launched by the date of this report.

3.3 Cloud in-situ facilities

During the validation of the TC activities and plans, the Interim ACTRIS Council (IAC, the highest decision-making body in ACTRIS at the time) decided in 2020 that one of the TCs, the Centre for Cloud In-Situ Measurements (CIS), was not ready to start operational activities before 2024. As NF labelling is considered to be an operational activity, CIS has not been participating in the process pilot or early phase of the operational labelling. It has, however, participated in the process planning and has adjusted its systems to match the labelling process and interface.

4 Labelling status in December 2023

To analyse the labelling status, we need to define the group for which the analysis is done. Out of the total 123 facilities 37 are exploratory and 86 observational platforms. As stated above, the labelling process of exploratory platforms has not started yet. From the observational platforms we need to further take out those that have only a cloud in-situ component (1, see reason above) and those that are located in Greece or UK (9) as those countries have not yet officially joined ACTRIS ERIC and therefore cannot host NFs. This leaves us with 76 observational platforms, consisting of 152 components (other than cloud in-situ).

As the labelling has started in 2022, it is obvious that none of the facilities has reached the full label requiring two consecutive years of valid ACTRIS measurements. Therefore, we concentrate here on the completion of labelling Step 1a, receiving the initial acceptance.

Out of the 76 facilities analysed here 16 (21 % of total NFs) have received the initial acceptance for one or more NF components. The situation is not as bad as these numbers suggest, because the labelling Step 1a takes time, and the process started in full volume only in 2023. There are further 25 (33 % of total NFs) facilities currently in the process of Step 1a, making the number of facilities that have entered the pipeline 41 facilities or 54 % of the total NFs applicable for this analysis.

On the NF component level, the number of initially accepted NF components is 23 (15 % of total NF components). Also here, there is a large fraction of NF components (41 NF components representing 27 % of all NF components) in the process, making the total number and fraction of NF components that have entered the pipeline 64 NF components and 42 %, respectively. The TCs have also announced their plans for onboarding 49 more NF components (32 % of all NF components) during 2024. These numbers, however, are not fully confirmed.

The number and fraction of NF components in various stages of the process is summarized in the two tables below. A complete overview of all ACTRIS NFs proposed by the countries is provided in Annex 1.

Table 1. Number of NF components by type in different stages of labelling Step 1a.

Status	Observational component					
	AIS	ARS	CRS	TGIS	TGRS	Total
Planned	15	4	7	9	4	39
Scheduled for 2024	17	13	6	12	1	49
In process	15	12	3	5	1	41
Initially accepted	9	5	5	2	2	23
Total	56	39	21	28	8	152

Table 2. Fraction of NF components by type in different stages of labelling step 1a.

Status	Observational component					
	AIS	ARS	CRS	TGIS	TGRS	Total
Planned	23 %	10 %	33 %	32 %	50 %	26 %
Scheduled for 2024	30 %	33 %	29 %	43 %	13 %	32 %
In process	27 %	44 %	14 %	18 %	13 %	27 %
Initially accepted	16 %	13 %	24 %	13 %	25 %	15 %

Annex 1. Labelling status of each National Facility

Table A1. All proposed ACTRIS National Facilities are listed and their status as of 20.12.2023 given for each proposed NF component. The table also includes the exploratory facilities, facilities in Greece and UK, and cloud in-situ NF components, which were not included in the analysis in the actual document. As the plans for 2024 are not all confirmed and some TCs have not specified which facilities they plan to take onboard, the facilities scheduled for 2024 are not separated from the other planned facilities.

Country	Facility name	Facility type	AIS	CIS	TGIS	ARS	CRS	TGRS
AT	Sonnblick Observatory (SBO)	Observational	In process	Planned				
AT	University Innsbruck (UIBK)	Observational			Planned			
AT	University Vienna (UNIVIE)	Observational	Planned					
BE	MARTISLAB-BE	Mobile			Planned			
BE	Ukkel	Observational	Planned					
BE	Vielsalm	Observational	In process		Planned			
BU	Basic Environmental Observatory Moussala - BEO Moussala	Observational	Planned					
BU	Sofia (IE-BAS)	Observational				In process		
CY	Unmanned Systems Research Laboratory (USRL)	Mobile	Planned					
CY	Cyprus Atmospheric Observatory (CAO)	Observational	Planned		Planned	Planned		
CY	Cyprus Atmospheric Remote Sensing Observatory CARO	Observational				In process	Planned	
CZ	Lom	Observational	Planned					
CZ	Suchdol	Observational	Accepted					
CZ	National Atmospheric Observatory Kosetice	Observational	Accepted		Planned	In process		
CZ	Milesovka	Observational		Planned				
DK	Aarhus University Research on Aerosols smog chamber facility (AURA)	Chamber	Planned					
DK	Copenhagen University; Photochemical reactor	Chamber	Planned					

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Country	Facility name	Facility type	AIS	CIS	TGIS	ARS	CRS	TGRS
DK	Risoe Research Station	Observational	Planned					
DK	Villum Research Station	Observational	Planned					
FI	Kuopio Atmospheric Simulation Chambers (KASCs)	Chamber	Planned					
FI	Aerosol, cluster and trace gas laboratory (Helsinki)	Laboratory	Planned		Planned			
FI	FComLab - Doppler Cloud Radar	Mobile					Planned	
FI	FComLab - Doppler Lidar	Mobile					Planned	
FI	Mobile Aerosol Laboratory	Mobile	Planned		Planned			
FI	Multiwavelength Raman Lidar	Mobile				Planned		
FI	Unmanned Aerial vehicle (UAV)	Mobile	Planned	Planned				
FI	Marambio	Observational	Planned					
FI	Pallas Atmosphere-Ecosystem Supersite	Observational	Accepted	Planned	In process		Planned	
FI	SMEAR II (Hyytiälä)	Observational	Accepted		Accepted	Planned	Accepted	
FI	SMEAR III (Helsinki)	Observational	Planned		Planned			
FI	SMEAR I (Värriö)	Observational	Planned	Planned	Planned			
FI	SMEAR IV (Kuopio)	Observational	In process	Planned				
FI	Utö Atmospheric and Marine Research Station	Observational	Planned					
FR	Chambre de simulation atmosphérique à irradiation naturelle d'Orléans (HELIOS)	Chamber	Planned		Planned			
FR	Multiphase Atmospheric Simulation Chamber (CESAM)	Chamber	Planned		Planned			
FR	Atmospheric Observatory of Lille (ATOLL)	Observational	In process			In process		
FR	Observatoire de Haute Provence (OHP-GEO)	Observational				Planned		
FR	Plateforme Pyrénéenne d'Observations Atmosphériques (P2OA)	Observational	Planned		Planned			
FR	Site d'observation atmosphériques Puy de Dôme/Opme/Cézeaux (COPDD)	Observational	Planned		Planned	In process		

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Country	Facility name	Facility type	AIS	CIS	TGIS	ARS	CRS	TGRS
FR	Site Instrumental de Recherche par Télédétection Atmosphérique (SIRTA)	Observational	In process		In process	In process	In process	
FR/BE	OPAR Observatoire de Physique de l'Atmosphère à La Réunion	Observational	Accepted			In process	Planned	Accepted
DE	Aerosol Interaction and Dynamics in the Atmosphere (AIDA and AIDA-dynamic)	Chamber	Planned	Planned				
DE	Atmosphere Simulation Chamber (SAPHIR)	Chamber	Planned		Planned			
DE	Atmospheric Chemistry Department Chamber (ACD-C)	Chamber	Planned		Planned			
DE	Quartz Glass Reactor (QUAREC)	Chamber	Planned		Planned			
DE	Turbulent Leipzig Aerosol Cloud Interaction Simulator (LACIS-T)	Chamber	Planned	Planned				
DE	Aerosol from Ground to Cloud Mobile Experiment (ACME)	Mobile	Planned	Planned				
DE	Karlsruhe Low-Cloud Exploratory Platform (KLOCX)	Mobile		Planned			Planned	
DE	Leipzig Aerosol and Cloud Remote Observations System (LACROS)	Mobile				Planned	Planned	
DE	Mobile FTIR spectrometer	Mobile						Planned
DE	OCEANET mobile shipborne remote sensing facility	Mobile				Planned		
DE	Bremen	Observational						Accepted
DE	Cape Verde Atmospheric Observatory	Observational	Planned		Planned	In process	Planned	
DE	Dushanbe, Tajikistan	Observational				In process		
DE	Garmisch-Partenkirchen/Zugspitze/Schneefernerhaus	Observational	In process			In process		Planned
DE	Jülich Observatory for Cloud Evolution (JOYCE)	Observational					Accepted	
DE	Melpitz Research Station	Observational	In process		Planned	Planned	Planned	
DE	Meteorological Observatory Hohenpeißenberg (DWD)	Observational	In process		In process	In process		
DE	Meteorological Observatory Lindenberg	Observational					Accepted	
DE	München	Observational				Planned	Planned	
DE	Ny-Ålesund, Spitsbergen	Observational				Planned		Planned

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Country	Facility name	Facility type	AIS	CIS	TGIS	ARS	CRS	TGRS
DE	Paramaribo, Surinam	Observational						Planned
DE	Schmücke	Observational	Planned	Planned	Planned			
DE	Taunus Observatory	Observational	Planned		Planned			
DE	Waldhof	Observational	In process		Planned			
EL	FORTH-ASC	Chamber	Planned					
EL	PANGEA mobile platform	Mobile				Planned		
EL	Athens Supersite Demokritos	Observational	Planned					
EL	Athens Supersite NOA	Observational	Planned		Planned			
EL	Athens Supersite NTUA	Observational				Planned		
EL	Finokalia	Observational	Planned					
EL	HELMOS Mt	Observational	Planned	Planned				
EL	PANGEA	Observational	Planned		Planned	Planned	Planned	Planned
EL	Thessaloniki	Observational				Planned		
IT	ChAMBRé	Chamber	Planned		Planned			
IT	CIAO Mobile Facility	Mobile				Planned	Planned	
IT	Lecce Mobile facility	Mobile	Planned		Planned			
IT	Atmospheric RomE joint Supersite	Observational				In process		
IT	CIAO	Observational	In process			Accepted	In process	Planned
IT	CMN-PV	Observational	In process	Planned	In process	In process		
IT	European Commission Atmospheric Observatory	Observational	In process		Planned	Planned		
IT	Lampedusa	Observational				Planned	Planned	
IT	Lecce (ECO CNR + UNISALENTO)	Observational	Planned		Planned	In process		
IT	Naples Fixed National Facility	Observational	Planned			Planned		
IT	UNIAQ/CETEMPS	Observational				In process	Planned	

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Country	Facility name	Facility type	AIS	CIS	TGIS	ARS	CRS	TGRS
NL	Ruisdael Observatory: CABAUW	Observational	Planned		Planned	Planned	Planned	Planned
NO	Birkenes	Observational	Accepted					
NO	Trollhaugen	Observational	Planned		Planned			
NO/SE	Zeppelin	Observational	In process	Planned	In process			
PL	ACTRIS-Poland Mobile LAB	Mobile				Planned		
PL	Belsk	Observational	Planned			Planned		
PL	Racibórz	Observational	In process			Planned		
PL	Rzecin	Observational				Planned	Planned	
PL	Strzyżów (ACTRIS ICOS collocated station)	Observational				Planned		
PL	Warsaw	Observational				Accepted	Planned	
PL	Wrocław	Observational	Planned			Planned		
RO	CERNESIM	Chamber	Planned		Planned			
RO	ATMOSLAB	Mobile	Planned	Planned		Planned		
RO	RADO-Bucharest	Observational	Accepted			Accepted	Accepted	
RO	RADO-Cluj	Observational				Accepted	Planned	
RO	RADO-Galati	Observational					Accepted	
RO	RADO-Iasi	Observational				In process		
ES	EUPHORE	Chamber	Planned		Planned			
ES	AGORA	Observational	Planned			In process	In process	
ES	Barcelona	Observational	Accepted			Accepted		
ES	ESAt - El Arenosillo	Observational	Planned					
ES	Izaña Atmospheric Observatory	Observational	In process					
ES	Madrid	Observational	Planned			Planned		
ES	Montsec	Observational	Planned					

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Country	Facility name	Facility type	AIS	CIS	TGIS	ARS	CRS	TGRS
ES	Montseny Supersite	Observational	In process					
ES	Exploratory platform SMHI	Mobile					Planned	
ES	Exploratory platform UG	Mobile	Planned		Planned			
ES	Hyltemossa	Observational	Planned		Planned			
ES	Norunda	Observational	Planned		Planned			
ES	Östergarnsholm	Observational	Planned					
ES	Svartberget	Observational	Planned		Planned			
CH	PACS	Chamber	Planned		Planned			
CH	Swiss Midland: Payerne(PAY) Beromuenster(BRM)	Observational	Planned		Planned	Planned	Planned	
CH/BE	Jungfrauoch	Observational	Accepted	Planned	Accepted			In process
UK	Manchester Aerosol Chamber	Chamber	Planned					
UK	Roland von Glasow Air-Sea-Ice Chamber	Chamber			Planned			
UK	Auchencorth Moss	Observational	Planned		Planned			
UK	Chilbolton Observatory	Observational				Planned	Planned	