

Milestone 4.5 Release of the list for priority operation support and services

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
Milestone no.	MS4.5
Lead beneficiary	INOE
Milestone 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	M12
Actual delivery date	24/02/2021
Version	Final
Reviewed by	Eija Juurola
Accepted by	Eija Juurola
Comments	

1 Contents

1	Contents	2
2	Background and purpose of this document.....	3
3	List of acronyms.....	3
4	List of priority operation support and services	3
4.1	Head Office (HO)	4
4.2	Data Centre (DC).....	5
4.3	Centre for Aerosol In-Situ Measurements (ECAC/CAIS).....	7
4.4	Centre for Aerosol Remote Sensing (CARS)	7
4.5	Centre for Cloud In-Situ Measurements (CIS)	8
4.6	Centre for Cloud Remote Sensing (CCRES).....	9
4.7	Centre for Reactive Trace Gases In-Situ Measurements (CiGas)	10
4.8	Centre for Reactive Trace Gases Remote Sensing (CREGARS)	13
5	Conclusions.....	15

2 Background and purpose of this document

During the ACTRIS-PPP project, several processes have been organized in order to define the roles and the responsibilities of the ACTRIS Central Facilities: from the development of the concept documents, to the iteration of the first implementation plans and validation of the planned activities in view of the RI operations. Successive community meetings, consultation with the users, evaluation by experts, recommendations from SIAB and finally decisions of the Interim ACTRIS Council led to the identification of the priority operation support and services to be implemented by the Central Facilities. Prioritization was further applied in order to reduce the operation costs while ensuring the fulfilment of ACTRIS objectives and ambition.

This document summarizes the priority operation support and services planned by the ACTRIS Central Facilities. General activities dedicated to management, interlinks with other ACTRIS structures, links with scientific communities, as well as those dedicated to development of science and technology are not listed here as they are not considered direct operation support or service.

3 List of acronyms

ACTRIS – Aerosol, Clouds and Trace gases Research InfraStructure
CF – Central Facility
HO – Head Office
DC – Data Centre
TC – Topical Centre
KPI – Key Performance Indicators
SOP – Standard Operation Procedure
QA – Quality Assurance
QC – Quality Control
NF – National Facility
ECAC/CAIS – Centre for Aerosol In-Situ Measurements
CARS – Centre for Aerosol Remote Sensing
CIS – Centre for Cloud In-Situ Measurements
CCRES – Centre for Cloud Remote Sensing
CiGas – Centre for Reactive Trace Gases In-Situ Measurements
CREGARS – Centre for Reactive Trace Gases Remote Sensing

4 List of priority operation support and services

The operation support and services have been proposed by the Central Facilities based on a thorough analysis of the ACTRIS goals, technical needs and feasibility. These were detailed in the first CF implementation plans, and went through a complex validation process (see ACTRIS-PPP final report). Three levels of priority have been set:

- **Crucial:** activities without which ACTRIS cannot operate; to be urgently implemented

ACTRIS IMP (www.actris.eu) is supported by the European Commission under the Horizon 2020 – Research and Innovation Framework Programme, H2020-INFRADEV-2019-2, Grant Agreement number: 871115

- **Necessary:** activities which are required in order to preserve the quality of ACTRIS data and services over time (e.g. to compensate for changing personnel and instrumentation); to be implemented soon after entering into operational phase
- **Added value:** activities which are required for maintaining the state-of-the-art of ACTRIS operations (e.g. by developing and up taking new technologies and algorithms, or extending the list of ACTRIS variables); to be implemented in the first 10 years of the operational phase

As an outcome of the validation process, each type of operation support or service has been analysed in terms of importance and urgency in the value chain. The high priority operation support and services (crucial and necessary) shall be implemented in the pre-operation phase or in the first years of the operation phase.

4.1 Head Office (HO)

No.	Name	Priority	Operation support	Service
1.	Access and tailored service management	Crucial	x	x
2.	Interface between users, Central Facilities (CFs) and National Facilities (NFs)	Crucial	x	x
3.	User service helpdesk	Crucial	x	x
4.	Management of the Science and User Forum	Crucial	x	x
5.	Human resources management	Crucial	x	
6.	Financial management	Crucial	x	
7.	ACTRIS ERIC legal management	Crucial	x	
8.	RI management support	Crucial	x	
9.	Coordination and integration of the CFs annual work plans	Crucial	x	
10.	Management of the ACTRIS governance bodies	Crucial	x	
11.	Preparation of ACTRIS Communication and dissemination strategy	Crucial	x	
12.	Internal communication	Crucial	x	
13.	Management of ACTRIS communication tools	Crucial	x	
14.	Promote ACTRIS activities to targeted audiences	Crucial	x	
15.	Coordinate the preparation of the ACTRIS User strategy	Crucial	x	
16.	Facilitate ACTRIS representation in various international fora	Crucial	x	
17.	Promote the engagement of new members and stakeholders with ACTRIS	Crucial	x	
18.	Build and maintain the connection with new user communities	Crucial	x	
19.	Development of an ACTRIS Innovation strategy	Crucial	x	
20.	Enhancing the use of ACTRIS exploratory and observational platforms	Crucial	x	

ACTRIS IMP (www.actris.eu) is supported by the European Commission under the Horizon 2020 – Research and Innovation Framework Programme, H2020-INFRADEV-2019-2, Grant Agreement number: 871115

No.	Name	Priority	Operation support	Service
21.	Coordinating the work towards the long-term strategy of ACTRIS	Crucial	x	
22.	Continue and strengthen the cooperation with the other RIs	Crucial	x	
23.	Contribute to the ESFRI processes, such as RI evaluations	Crucial	x	
24.	Development of the risk registry, and updating the risk management plan	Crucial	x	
25.	Development of the self-assessment system and the KPIs	Crucial	x	
26.	Establishment of Access KPIs & Service Provision Activity reporting format	Crucial	x	
27.	Planning of the next validation round and the evaluation at the end of the implementation phase of ACTRIS	Crucial	x	
28.	Development of the interfaces for the monitoring access and service provision	Crucial	x	

4.2 Data Centre (DC)

No.	Name	Priority	Operation support	Service
1.	Archiving and preservation of In-Situ data	Crucial	x	
2.	Archiving and preservation of ARES data	Crucial	x	
3.	Archiving and preservation of CLU data	Crucial	x	
4.	Archiving and preservation of GRES data	Crucial	x	
5.	Archiving and preservation of ASC data	Crucial	x	
6.	Development and implementation of data production tools for generating the required data levels	Crucial	x	
7.	Implementation of data quality control tools and procedures developed in DC or TCs,	Crucial	x	
8.	Online portal for standardised submission of data by NF operators to DC,	Crucial	x	
9.	Standardised sanity and consistency checks of data submitted through submission service,	Crucial	x	
10.	Development and maintenance of tools for quality control of data, including implementation of new quality assurance criteria defined by TCs,	Crucial	x	
11.	Tools for performing quality controls homogeneously at NF,	Crucial	x	

ACTRIS IMP (www.actris.eu) is supported by the European Commission under the Horizon 2020 – Research and Innovation Framework Programme, H2020-INFRADEV-2019-2, Grant Agreement number: 871115

No.	Name	Priority	Operation support	Service
12.	Implementation of data flow for new instruments from NF to DC in collaboration with TCs.	Crucial	x	
13.	Automatic and centralized processing tools for achieving quality assured, Real-Real-time (RRT) or Near-Real-Time (NRT) data from observational NF platforms at the network level.	Crucial	x	
14.	Data curation of data from the topic centres for internal use in documenting provenance and QA/QC, and for external users as reference data	Crucial	x	
15.	Digital tools and services	Necessary	x	x
16.	Campaign dashboard	Necessary	x	x
17.	Data curation and archive of campaign data	Necessary	x	x
18.	Archiving results of QA measures on instruments at the DC unit level, linking them to the data by means of persistent identifiers	Crucial	x	x
19.	Identifying all entities active in ACTRIS data production.	Crucial	x	x
20.	Provenance of data products is documented for each execution of data production workflows by means of a standardised provenance scheme	Crucial	x	x
21.	Focused training sessions on pre-defined data types and topics	Necessary	x	x
22.	Transfer of expertise during online exercises and workshops	Crucial	x	x
23.	Documentation, procedures, tutorials and tools available on the data centre website	Crucial	x	x
24.	Guidance for NFs in setting up data flows to DC unit	Crucial	x	x
25.	Help desk for data submission and reporting periods	Crucial	x	x
26.	Participation in summer/winter school for students and scientists and during large comprehensive campaigns	Necessary	x	x
27.	Access to ACTRIS level 0	Crucial		x
28.	Access to ACTRIS level 1	Crucial		x
29.	Access to ACTRIS level 2	Crucial		x
30.	Access to ACTRIS level 3 and to specific data products on demand	Crucial		x
31.	Access to ACTRIS legacy data	Crucial		x
32.	ACTRIS level 3a: Production of level 3 data solely based on ACTRIS observational platforms	Crucial		x
33.	ACTRIS level 3b: Production of ACTRIS level 3 data and tools through multi-source data integration services, employing external ground-based measurement data	Necessary		x

ACTRIS IMP (www.actris.eu) is supported by the European Commission under the Horizon 2020 – Research and Innovation Framework Programme, H2020-INFRADEV-2019-2, Grant Agreement number: 871115

No.	Name	Priority	Operation support	Service
34.	ACTRIS level 3c: Production of ACTRIS level 3 data products involving regional and global model data	Necessary		x
35.	Selected ACTRIS data curation and archive services	Necessary		x

4.3 Centre for Aerosol In-Situ Measurements (ECAC/CAIS)

No.	Name	Priority	Operation support	Service
1.	Hold a hands-on training course (instruments and/or measurement + data tools)	Crucial	x	x
2.	Hold a common aerosol lecture	Added-Value	x	x
3.	Consult stakeholder (authorities, environmental agencies, industry, etc.)	Necessary		x
4.	Update measurement or data guidelines	Crucial	x	x
5.	Update NF-set-up guideline	Crucial	x	x
6.	Update measurement or data criteria	Necessary	x	x
7.	Update measurement or data tools	Necessary	x	x
8.	Review ACTRIS data together with NFs	Crucial	x	
9.	Conduct a CPC calibration workshop	Crucial	x	x
10.	Conduct a MPSS calibration workshop	Crucial	x	x
11.	Conduct a nephelometer calibration workshop	Crucial	x	x
12.	Conduct an absorption photometer calibration workshop	Crucial	x	x
13.	Conduct an APSS/OPSS calibration workshop	Crucial	x	x
14.	Conduct a CCNC calibration workshop	Crucial	x	x
15.	Conduct an aerosol-MS calibration workshop for observational platforms	Crucial	x	x
16.	Conduct a NAIS calibration workshop	Crucial	x	x
17.	Conduct a PSM performance workshop	Crucial	x	x
18.	Conduct a Round Robin test with instrument	Crucial	x	x
19.	Conduct a Round Robin test with reference samples and particulate tracer compounds	Crucial	x	x
20.	Conduct an aerosol-MS calibration workshops for exploratory platforms	Added-Value	x	x
21.	Check NF compliance with ACTRIS requirements	Crucial	x	

4.4 Centre for Aerosol Remote Sensing (CARS)

ACTRIS IMP (www.actris.eu) is supported by the European Commission under the Horizon 2020 – Research and Innovation Framework Programme, H2020-INFRADEV-2019-2, Grant Agreement number: 871115

No.	Name	Priority	Operation support	Service
1.	Organization of CARS training events	Crucial	x	x
2.	Organization of CARS webinars	Crucial	x	x
3.	Consultancy to associated NFs	Crucial	x	
4.	Consultancy to stakeholders, users and private companies	Added-value		x
5.	Documentation and revision of Quality Assurance criteria	Crucial	x	x
6.	Documentation and revision of measurement procedures and guidelines (Standard Operation Procedures, instrument calibration, data processing)	Crucial	x	x
7.	Definition of data submission protocols and data formats	Crucial	x	x
8.	Development and update of Quality Assurance tools	Crucial	x	x
9.	Implementation of the Quality Assurance tools at the instrument observation sites	Crucial	x	
10.	Implementation and execution of the operational workflows with ARES and CCRES	Crucial	x	
11.	Measurements traceability	Necessary	x	
12.	Calibration of field instruments	Crucial	x	x
13.	Instrument performance test	Crucial	x	
14.	Laboratory characterization of instruments and blocks	Necessary	x	x
15.	Support for instrument debugging	Necessary	x	
16.	Support for increasing data availability	Necessary	x	
17.	Quality control of the measurements	Crucial	x	x
18.	Quality control of the data	Crucial	x	x
19.	Evaluation of the applications for the candidate NFs	Crucial	x	
20.	Site audits	Crucial	x	
21.	Annual evaluation of the NFs	Crucial	x	

4.5 Centre for Cloud In-Situ Measurements (CIS)

No.	Name	Priority	Operation support	Service
1.	Training of staff	Crucial	x	
2.	Training of NF operators and/or technicians	Crucial	x	
3.	Consultancy for potential new observational sites	Necessary	x	
4.	Consultancy to stakeholders, users and private companies	Added-value		x
5.	SOPs: development and updates	Crucial	x	
6.	Calibration methods: development and updates	Crucial	x	

ACTRIS IMP (www.actris.eu) is supported by the European Commission under the Horizon 2020 – Research and Innovation Framework Programme, H2020-INFRADEV-2019-2, Grant Agreement number: 871115

No.	Name	Priority	Operation support	Service
7.	Instrument and measurement guidelines: development and updates	Crucial	x	
8.	Data workflow and processing guidelines: development, implementation and updates	Crucial	x	
9.	QA criteria and documents: development and updates	Crucial	x	
10.	QA tools: development, implementation and updates	Crucial	x	
11.	Data Quality evaluation procedures: development, use and updates	Crucial	x	
12.	QC audits of NFs	Necessary	x	
13.	Intercomparison Campaigns	Necessary	x	
14.	Instrument Performance test: Instrument calibration, Round Robin tests	Crucial	x	
15.	Technical implementation of TC units		x	
16.	Technical maintenance and updates of TC units	Crucial	x	
17.	Developing guidelines for setting up specific NF types	Crucial	x	
18.	Definition of milestones and performance checks during implementation and pre-operation of NFs	Necessary	x	
19.	Evaluation of NF applications	Crucial	x	
20.	Support implementation and pre-operation of NFs	Necessary	x	
21.	Advice on improvements and adjustments during pre-operation of NFs	Necessary	x	
22.	Reporting on milestones during implementation and pre-operation of NFs	Crucial	x	
23.	Labelling verification through audits	Crucial	x	
24.	Reporting of NF readiness	Crucial	x	
25.	Assessment of technical performance for re-evaluations	Crucial	x	

4.6 Centre for Cloud Remote Sensing (CCRES)

No.	Name	Priority	Operation support	Service
1.	Training of staff	Crucial	x	x
2.	Training of instrument operators	Crucial	x	
3.	Intensive courses	Added value	x	x
4.	Webinars	Added value	x	x
5.	Summer schools	Added value	x	x
6.	Consultancy for setting up observation sites	Added value		x
7.	Consultancy to stakeholders, users and private companies	Added value		x

ACTRIS IMP (www.actris.eu) is supported by the European Commission under the Horizon 2020 – Research and Innovation Framework Programme, H2020-INFRADEV-2019-2, Grant Agreement number: 871115

No.	Name	Priority	Operation support	Service
8.	SOPs	Crucial	x	
9.	Calibration methods	Crucial	x	
10.	Instrument guidelines	Crucial	x	
11.	Measurement guidelines	Crucial	x	
12.	Data processing guidelines	Crucial	x	
13.	QA criteria	Crucial	x	
14.	QA tools	Crucial	x	
15.	Definition of target uncertainties of the instrument	Crucial	x	
16.	Definition of target uncertainties in closure studies	Crucial	x	
17.	Central processing components	Crucial	x	
18.	Housekeeping data real time analysis tool	Crucial	x	
19.	Data evaluation procedures and plausibility tests	Crucial	x	
20.	Quality control of the measurements	Crucial	x	
21.	Quality control of the data	Crucial	x	
22.	Workshops for reviewing the quality of the data	Crucial	x	
23.	Intercomparison Campaigns	Crucial	x	
24.	Instrument Performance test	Crucial	x	
25.	Measurements traceability	Crucial	x	
26.	Technical maintenance and updates of TC units	Necessary	x	
27.	Evaluation of the application	Crucial	x	
28.	Labeling verification through audits	Crucial	x	

4.7 Centre for Reactive Trace Gases In-Situ Measurements (CiGas)

No.	Name	Priority	Operation support	Service
1.	VOC: training + consultancy	Necessary	x	x
2.	CI-APITOF-MS: training + consultancy	Necessary	x	x
3.	NOx: training + consultancy	Necessary	x	x
4.	ANMHCs GC-FID/MS: MG (sampling, calibration, data processing, corrections, submission), contribution to CEN, ISO	Crucial	x	x
5.	OVOCs GC-FID/MS: MG (sampling, calibration, data processing, corrections, submission)	Crucial	x	x
6.	OVOCs PTR-MS: MG (sampling, calibration, data processing, corrections, submission)	Crucial	x	x
7.	OVOCs DNPH: MG (sampling, calibration, data processing, corrections, submission)	Crucial	x	x
8.	OVOCs HCHO: MG (sampling, calibration, data processing, corrections, submission)	Crucial	x	x

ACTRIS IMP (www.actris.eu) is supported by the European Commission under the Horizon 2020 – Research and Innovation Framework Programme, H2020-INFRADEV-2019-2, Grant Agreement number: 871115

No.	Name	Priority	Operation support	Service
9.	BNMHCs GC-FID/MS: MG (sampling, calibration, data processing, corrections, submission)	Crucial	x	x
10.	CI-APITOF-MS: MG (sampling, calibration, data processing, corrections, submission)	Crucial	x	x
11.	NO-CLD: MG (sampling, calibration, data processing, corrections, submission)	Crucial	x	x
12.	NO2-PLC/BLC-CLD: MG (sampling, calibration, data processing, corrections, submission)	Crucial	x	x
13.	ANMHCS GC-FID/MS: WS/target gas calibration and provision	Necessary	x	x
14.	OVOCs GC-FID/MS: WS/target gas calibration and provision	Necessary	x	x
15.	OVOCs PTR-MS: WS/target gas calibration and provision	Necessary	x	x
16.	OVOCs DNPH: WS/target gas calibration and provision	Necessary	x	x
17.	OVOCs HCHO: WS/Target gas calibration and provision	Necessary	x	x
18.	BNMHCs GC-FID/MS: WS/target gas calibration and provision	Necessary	x	x
19.	CI-APITOF-MS: WS/target gas calibration and provision	Necessary	x	x
20.	NO-CLD: WS/target gas calibration and provision	Necessary	x	x
21.	NO2-PLC/BLC-CLD: WS/target gas calibration and provision	Necessary	x	x
22.	NO2-CAPS: WS/target gas calibration and provision	Necessary	x	x
23.	ANMHCS GC-FID/MS: Working standard - calibration check	Necessary	x	
24.	OVOCs GC-FID/MS: Working standard - calibration check	Necessary	x	
25.	OVOCs PTR-MS: Working standard - calibration check	Necessary	x	
26.	OVOCs DNPH: Working standard - calibration check	Necessary	x	
27.	OVOCs HCHO: Working standard - calibration check	Necessary	x	
28.	BNMHCs GC-FID/MS: Working standard - calibration check	Necessary	x	
29.	CI-APITOF-MS: Working standard - calibration check	Necessary	x	
30.	NO-CLD: Working standard - calibration check	Necessary	x	
31.	NO2-PLC/BLC-CLD: Working standard - calibration check	Necessary	x	
32.	NO2-CAPS: Working standard - calibration check	Necessary	x	
33.	ANMHCS GC-FID/MS: round robin	Crucial	x	x
34.	OVOCs GC-FID/MS: round robin	Crucial	x	x

ACTRIS IMP (www.actris.eu) is supported by the European Commission under the Horizon 2020 – Research and Innovation Framework Programme, H2020-INFRADEV-2019-2, Grant Agreement number: 871115

No.	Name	Priority	Operation support	Service
35.	OVOCs PTR-MS: round robin	Crucial	x	x
36.	OVOCs PTR-MS: parallel measurements at station by reference method or instrument	Added-value	x	
37.	OVOCs DNPH: round robin	Crucial	x	x
38.	OVOCs DNPH: parallel measurements at station by reference method or instrument	Added-value	x	x
39.	OVOCs HCHO: round robin	Crucial	x	x
40.	OVOCs HCHO: parallel measurements at station by reference method or instrument	Added-value	x	
41.	BNMHCs GC-FID/MS: round robin	Crucial	x	x
42.	CI-APITOF-MS: round robin	Crucial	x	x
43.	CI-APITOF-MS: parallel measurements at station by reference method or instrument	Added-value	x	
44.	NO-CLD: round robin	Crucial	x	x
45.	NO-CLD: parallel measurements at station by reference method or instrument	Added-value	x	
46.	NO2-PLC/BLC-CLD: round robin	Crucial	x	x
47.	NO2-PLC/BLC-CLD: parallel measurements at station by reference method or instrument	Added-value	x	
48.	NO2-CAPS: round robin	Crucial	x	x
49.	NO2-CAPS: parallel measurements at station by reference method or instrument	Added-value	x	
50.	VOC: Side-by-Side intercomparison, preparation	Added-value	x	x
51.	VOC: Side-by-Side intercomparison campaign	Added-value	x	x
52.	OVOCs HCHO: s-b-s intercomparison	Added-value	x	x
53.	CI-APITOF-MS: s-b-s intercomparison	Added-value	x	x
54.	VOC: Side-by-Side intercomparison, preparation	Added-value	x	x
55.	VOC: Annual Data Workshop	Crucial	x	
56.	VOC: Data Plausibility Checks VOC + Workshop preparation	Crucial	x	
57.	CI-APITOF-MS: plausibility checks + issue tracker	Crucial	x	
58.	CI-APITOF-MS: data quality workshops	Crucial	x	
59.	NOx: plausibility checks + issue tracker	Crucial	x	
60.	NOx: data quality workshops	Crucial	x	
61.	NF VOC: Performance Audit	Crucial	x	
62.	OVOCs DNPH: NF performance audits	Crucial	x	
63.	CI-APITOF-MS: NF performance audits	Crucial	x	
64.	NOx: NF performance audits	Crucial	x	
65.	ANMHCs GC-FID/MS: labelling	Crucial	x	x
66.	OVOCs GC-FID/MS: labelling	Crucial	x	x
67.	OVOCs PTR-MS: labelling	Crucial	x	x
68.	OVOCs DNPH: labelling	Crucial	x	x

ACTRIS IMP (www.actris.eu) is supported by the European Commission under the Horizon 2020 – Research and Innovation Framework Programme, H2020-INFRADEV-2019-2, Grant Agreement number: 871115

No.	Name	Priority	Operation support	Service
69.	OVOCs HCHO: labelling	Crucial	x	x
70.	BNMHCs GC-FID/MS: labelling	Crucial	x	x
71.	CI-APITOF-MS: labelling	Crucial	x	x
72.	NO-CLD: labelling	Crucial	x	x
73.	NO2-PLC/BLC-CLD: labelling	Crucial	x	x
74.	NO2-CAPS: labelling	Crucial	x	x
75.	ANMHCS GC-FID/MS: labelling	Crucial	x	x
76.	OVOCs GC-FID/MS: labelling	Crucial	x	x

4.8 Centre for Reactive Trace Gases Remote Sensing (CREGARS)

No.	Name	Priority	Operation support	Service
1.	Organization of CREGARS workshops for the operation of the CF	Necessary	x	x
2.	Training of FTIR operators through provision of didactic guidelines	Necessary	x	x
3.	Training of FTIR data providers using SFIT4	Necessary	x	x
4.	Consultancy for setting-up new observational or exploratory platforms and new FTIR instruments at the NFs	Necessary	x	x
5.	Consultancy for setting-up new observational or exploratory platforms and new UVVIS instruments at the NFs	Necessary	x	x
6.	Training of MAX-DOAS operators and scientists	Crucial	x	x
7.	Training of SAOZ operators and scientists	Crucial	x	x
8.	Training of ACTRIS Pandora operators and scientists	Crucial	x	x
9.	Consultancy for setting-up new observational or exploratory LIDAR platforms and new instruments at the NFs	Added-value	x	x
10.	Update of training material	Necessary	x	x
11.	Provision of measurement guidelines for ILS characterization	Crucial	x	x
12.	Provision and maintenance of retrieval software SFIT4	Crucial	x	x
13.	Provision and maintenance of the retrieval strategy for all ACTRIS FTIR target species (O3, HCHO, C2H6, NO2 and NH3)	Crucial	x	x
14.	Provision and maintenance of control files and reference spectroscopic data for all ACTRIS FTIR target species	Crucial	x	x

ACTRIS IMP (www.actris.eu) is supported by the European Commission under the Horizon 2020 – Research and Innovation Framework Programme, H2020-INFRADEV-2019-2, Grant Agreement number: 871115

No.	Name	Priority	Operation support	Service
15.	Development of control files and reference spectroscopic data for new ACTRIS FTIR target species	Added-value	x	x
16.	Extend QA/QC to monitor new candidate users	Necessary	x	x
17.	Extend FTIR central processing L1 to L2 for new candidate users	Necessary	x	x
18.	Provision of procedures for UVVIS instrument characterisation	Necessary	x	x
19.	Provision of procedures for UVVIS instruments data acquisition	Necessary	x	x
20.	Provision of measurement guidelines for QA/QC of standardised data from UVVIS instruments	Necessary	x	x
21.	Provision of guidelines and software tools to monitor performance of UVVIS instruments	Necessary	x	x
22.	Characterization of LIDAR signals for instrumental set-ups.	Crucial	x	x
23.	Guidelines for automatic NRT LIDAR data processing. Service provided to users in need.	Added-value	x	x
24.	Maintenance of exploratory platform guidelines	Added-value	x	x
25.	QA/QC of instrument setup and measurements (operations) through verification of sample L1 data	Crucial	x	x
26.	QA/QC of L2 FTIR, UVVIS and LIDAR products before submission to Data Center	Crucial	x	x
27.	FTIR central processing L1 to L2	Crucial	x	x
28.	Verification of the calibration cells against a calibrated N2O cell.	Crucial	x	x
29.	Central Reprocessing L1 to L2 after strategy update	Necessary	x	x
30.	Performance audit of UVVIS instruments by comparison to CREGARS Certified Standard instruments	Necessary	x	x
31.	MAX-DOAS central processing (L1-L2) in RD mode	Necessary	x	x
32.	SAOZ central processing (L1-L2) in RD mode	Necessary	x	x
33.	ACTRIS Pandora central processing and data submission in GEOMS format	Necessary	x	x
34.	Provision of monthly statistical report of QA/QC to UVVIS data providers	Necessary	x	x
35.	QA/QC of long-term stability and homogeneity of UVVIS datasets using external reference data.	Added-value	x	x
36.	Hosting and participating in Intercalibration campaign at Cabauw	Crucial	x	x
37.	Remote control of Pandora instruments ("Network operator tasks")	Crucial	x	x

ACTRIS IMP (www.actris.eu) is supported by the European Commission under the Horizon 2020 – Research and Innovation Framework Programme, H2020-INFRADEV-2019-2, Grant Agreement number: 871115

No.	Name	Priority	Operation support	Service
38.	Field of view adjustment for an ACTRIS Pandora in the laboratory	Crucial	x	
39.	Field of view characterization for an ACTRIS Pandora in the laboratory	Added-value	x	
40.	Full wavelength calibration for one UVVIS unit at 3 temperatures in the laboratory	Crucial	x	x
41.	Radiometric calibration for a UVVIS unit in the laboratory	Crucial	x	x
42.	Spectral stray light calibration for a UVVIS unit in the laboratory	Necessary	x	x
43.	Analyze the laboratory measurements for one UVVIS unit and build instrument calibration file	Crucial	x	x
44.	Make individual UVVIS laboratory calibration report	Added-value	x	x
45.	Perform initial field tests for ACTRIS Pandora at Innsbruck	Crucial	x	x
46.	Make individual ACTRIS Pandora initial field test report	Added-value	x	
47.	On-site calibration of Pandora using mobile reference Pandora instrument and field calibration tool	Crucial	x	x
48.	Remote calibration stability checks based on field data	Crucial	x	x
49.	Quarterly instrument performance report for ACTRIS Pandoras	Added-value	x	
50.	Quality check of lidar signals including feedback to the users	Necessary	x	x
51.	Assistance in implementation of LIDAR intercomparison campaign at NF	Added-value	x	x
52.	Calibration of exploratory platform instruments	Necessary	x	
53.	Labeling verification through audits	Crucial	x	
54.	Evaluation of CREGARS NF application	Crucial	x	

5 Conclusions

The list of priority operation support and services to be implemented by the CFs is presented in this document. Note that the activities of the CFs also include management and coordination, interlinkages with other CFs, links with the scientific communities, and scientific and technological developments, which are not listed here because they are not directly associated to operation support and/or services, although contributing to those in an indirect manner.

The estimated date when each of the operation support / service will be available will be described in the CF revised implementation plans (D4.3, Month 24).

ACTRIS IMP (www.actris.eu) is supported by the European Commission under the Horizon 2020 – Research and Innovation Framework Programme, H2020-INFRADEV-2019-2, Grant Agreement number: 871115