

Milestone 5.1: Exercises to test RI operations at experienced NFs defined

Authors: Lucia Mona, Ulla Wandinger, Carmela Cornacchia, Bart Dils, Eija Juurola, Niku Kivekäs, Elke Ludewig, Cathrine Lund Myhre, Richard O. Rud, Doina Nicolae, Sabine Philippin, Markus Fiebig, Ewan O'Connor, Robert Wegener, Ralf Tillmann, Rainer Steinbrecher, Stephanie Schüttauf, Alfred Wiedensohler, Kristina Höhler, Bénédicte Picquet-Varrault, Astrid Kiendler-Scharr

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1 Background and purpose of this document

The aim of this report is to define exercises for testing the RI into operation. ACTRIS consists of many interlinked branches that once in operation should efficiently communicate with each other, allowing the whole system to be up and running. The exercises will consist of checking the efficiency and clearness of communication in the different steps of the workflow linking Head Office (HO), Data Centre (DC), Topical Centres (TC) and National Facilities (NF), first in the NF labelling process and then into the operation phase. Exercises for testing the RI operation will be coupled with the test of labelling process and will be based on experienced National Facilities selection described in D5.1. The test exercises will be able to identify, if any, deficiencies or bottlenecks and to highlight potential improvements in the overall organization of ACTRIS. These exercises additionally will allow to identify, face and address issues still open and unresolved. The role of experienced NFs in this context is a key aspect, coupling the best expertise available within ACTRIS and so driving the implementation processes in the most suitable and efficient way.

The RI operation exercises are planned on the base of the workflows described in ACTRIS IMP D4.1 and ACTRIS Data Management Plan, and on the labelling process developed in ACTRIS PPP project (ACTRIS-PPP D5.3 and D5.4). The section 2 reports the general aspects identified as common to all ACTRIS components for testing the RI operation, while section 3 reports into details the aspects to be tested for each ACTRIS components with its own specificity.

2 Testing RI operation: the general schema

ACTRIS is a very complex research infrastructure consisting of Head Office, Data Centre, 6 Topical Centres and numerous National Facilities. The 6 Topical Centres are related to different atmospheric components and observational techniques: Aerosol Remote Sensing, Aerosol in Situ, Clouds Remote Sensing, Clouds in Situ, Trace Gases Remote Sensing and Trace Gases in Situ. A National Facility can provide observations for one or more of these 6 components and could be an Observational Facility (fixed observational location) or an Exploratory Platform (a mobile facility or chamber for measurements in controlled conditions). Additionally, a NF may or may not provide access to users for measurements campaigns, experiments, or services in general. The physical and remote access to ACTRIS services is handled by the Service Access Management Unit (SAMU) of the ACTRIS Head Office.

With the objective of testing the whole RI operations, planned exercises should cover all the activities and functionalities. Therefore, exercises are organized to test the RI operation for all the different components: the 6 ACTRIS components organized around the Topical Centres + the atmospheric simulation chamber component. In this way it would be possible to test the workflow between each one of TCs, the ACTRIS Simulation Chamber Committee (ASCC) in case of Atmospheric Simulation Chambers, and respective NF, but also the connection between both TC + ASCC and NF with the corresponding units of the Data Centre. Fundamental for the efficient workflow is the role of the Head Office fostering interaction with TC + ASCC, NF and DC at different points of the operation process. Finally, the linkages with SAMU for the labelling of NFs providing accesses is also considered as part of the exercise.

However, not all the ACTRIS components have the same level of maturity and therefore the testing exercise could have different timing, as for the case of Cloud In Situ (CIS) component for which the implementation of labelling processes is foreseen by 2023-2024 and the chamber operation for which the ASCC in charge of it is not yet in place, and therefore the exercise would be postponed and better defined in a second moment.

A specific list of points to be checked has been prepared by all components described above and is reported in the next section for the sake of completeness. However, the main aspects to be checked for the ACTRIS RI operation are in common for all the ACTRIS components and are reported below:

Step1a: Initial acceptance as National Facility

- 1) Submission of the application by the NF
 - a) HO: **functionality** of the online submission system
 - b) TC+DC(+ASCC): **clear requirements and criteria** to be initially certified as NF
 - c) SAMU: **clear guidelines** about access definition, requirements, and cost calculation
- 2) Evaluation of the application by TC, DC and SAMU
 - a) TC + DC (+ASCC): **objective evaluation** and scoring (arguments and recommendations included)
 - b) SAMU: **evaluation as NF access provider** (Y/N and recommendations included)
- 3) Decision making
 - a) TC + DC (+ASCC) + SAMU: **agreement** on the general assessment
 - b) HO: promptitude and completeness of the communication with the NFs

Step1b: pre-operation and operation of the National Facility

- 4) Communication of CFs (+ASCC) with the NFs
 - a) HO + TC +DC (+ASCC): **functionality** of the specific mailing lists and TC mini website (embedded into ACTRIS website)
 - b) HO + TC +DC (+ASCC): easy and continuous **access** to information via the TC mini website (documents, announcements, repositories)
 - c) HO + TC +DC (+ASCC): **effectiveness** of the sharing of responsibilities:
 - Who is communicating what, to whom and through which channels
 - Who and what information is posting on the ACTRIS website
 - No duplicate information, no duplicate communication
- 5) Provision of CFs operation support to NFs
 - a) TC + DC(+ASCC): **easy access** to updated SOPs, SQAPs, guidelines and tools
 - TC + DC (+ASCC): ensuring easy and continuous access to updated SOPs, SQAPs, guidelines, data processing documentation and tools
 - b) TC + DC → NF: **timely and efficient** support to setup and operate the instruments
 - TC → NF: consultancy to setup / purchase / upgrade the instrumentation
 - TC + DC → NF: consultancy and training activities to NFs
 - c) TC + DC(+ASCC) → NF: **timely and efficient** QA/QC of the measurements and data
 - d) TC + DC (+ASCC)→ NF: **efficient** support to optimize the operations

- e) TC + DC (+ASCC)→ HO: **objective and timely** reporting on the NF progress
- 7) Provision of SAMU operation support to NFs
 - a) SAMU → NF: **easy access** to updated guidelines and tools **related to access** through
 - b) SAMU → NF: support in advertising the services and improving their visibility and discoverability to ensure maximum use of all ACTRIS resources
 - c) SAMU → NF: **timely and efficient** support to optimize the access management through PASS (platform for managing access to ACTRIS services)
 - d) SAMU → NF: support to receive and process user feedback after the access provision

For running ACTRIS this general schema applies in different manner to the various ACTRIS components because of the differences in their technical implementations. In particular, the requirements the QA/QC activities and the support for optimize the operations are declined in specific way for each component of ACTRIS. A more detailed list of tests to be done in the workflow for each ACTRIS component is reported in the following section.

3 Specification of testing exercise for each ACTRIS component

In the following the point-by-point checklist is reported for the workflow of each ACTRIS component. This reflects the workflow and task sharing reported in the ACTRIS Data Management Plan and recalled in ACTRIS IMP D4.1.

Particularly interesting for the purposes of the testing exercise are the detailed workflows developed by the TC and DC units for the different components. Such workflows are available at the following links:

- [Appendix 3: ACTRIS In situ data centre unit \(In-Situ\) data life cycle](#)
- [Appendix 4: ACTRIS Aerosol remote sensing data centre unit \(ARES\) data life cycle and workflow diagram](#)
- [Appendix 5: ACTRIS Cloud remote sensing data centre unit \(CLU\) data life cycle and workflow diagram](#)
- [Appendix 6: ACTRIS trace gases remote sensing data centre unit \(GRES\) data life cycle and workflow diagram](#)
- [Appendix 7: ACTRIS Atmospheric simulation chamber data centre unit \(ASC\) data life cycle and workflow diagram](#)

For the sake of clearness here the list of acronyms for different Topical Centres and DC units are reported:

ARES = Aerosol Remote Sensing Data Centre unit
ASC = Atmospheric Simulation Chamber Data Centre unit
ASCC = Atmospheric Simulation Chamber Committee
CARS = Centre for Aerosol Remote Sensing
CCRES=Centre for Cloud Remote Sensing
CiGas = Centre for In situ trace Gases
CIS = Cloud in situ
CLU = CLOUD data centre Unit
CREGARS = Centre for Reactive Trace Gases Remote Sensing;
ECAC-CAIS = European Centre for Aerosol Calibration and Characterization / Centre for Aerosol In-Situ
GRES = Gas Remote Sensing data centre unit
In Situ DC = ACTRIS Data Centre unit for in situ measurements

3.1 Testing workflow for the Aerosol Remote Sensing component

Step1a: Initial acceptance as National Facility

- 1) Submission of the application by the NF
 - a) HO: **functionality** of the online submission system
 - b) CARS + ARES: **clear requirements and criteria** to be initially certified as ARS NF
 - At least one of the required instruments available at the station + realistic plans for installing the other one in max. 2 years
 - A nominated PI and a nominated deputy
 - At least one skilled operator, commitment for at least 2 years
 - IT capacity to store locally, and to transfer to ARES level 0 data
 - Institutional support for long-term operation (space, personnel, spare parts and consumables, services for maintenance, travel to CARS-ARES events)
 - c) SAMU: **clear guidelines** about access definition, requirements and cost calculation
- 2) Evaluation of the application by CARS, ARES and SAMU
 - a) CARS + ARES: **objective evaluation** and scoring (arguments and recommendations included)
 - b) SAMU: **evaluation as NF access provider** (Y/N and recommendations included)
- 3) Decision making
 - a) CARS + ARES + SAMU: **agreement** on the general assessment
 - b) HO: promptitude and completeness of the communication with the NFs

Step1b: pre-operation and operation of the National Facility

- 4) Communication of CFs with the NFs
 - a) HO + CARS +ARES: **functionality** of the ARS mailing lists and CARS mini website (embedded into ACTRIS website)
 - b) HO + CARS +ARES: easy and continuous **access** to information via the CARS mini website (documents, announcements, repositories)
 - c) HO + CARS +ARES: **effectiveness** of the sharing of responsibilities:
 - Who is communicating what, to whom and through which channels
 - Who and what information is posting on the ACTRIS website
 - No duplicate information, no duplicate communication
- 5) Provision of CFs operation support to NFs
 - a) CARS + ARES: **easy access** to updated SOPs, SQAPs, guidelines and tools
 - i) CARS: ensuring easy and continuous access to updated SOPs, SQAPs, guidelines and tools for lidar, photometer and ceilometer
 - ii) ARES: ensuring easy access to data processing chain's updated documentation
 - b) CARS + ARES → NF: **timely and efficient** support to setup and operate the instruments
 - i) CARS → NF: consultancy to setup / purchase / upgrade the instrumentation
 - ii) CARS + ARES → NF: consultancy and training to setup the lidar into the SCC (completion of the HoI)
 - c) CARS + ARES → NF: **timely and efficient** QA/QC of the measurements and data

- i) NF → CARS → NF: expert analysis of the QA tests to assess the lidar performance
- ii) CARS → ARES: approval and locking of the SCC operational configuration
- iii) NF → CARS → NF: calibration of the photometer
- iv) ARES: continuous data processing, quality control of the data products, data traceability, data access
- d) CARS + ARES → NF: **efficient** support to optimize the operations
 - i) CARS → NF: timely and efficient consultancy and training to install QA tools at the NF
 - ii) CARS + ARES → NF: timely and efficient consultancy, training and support for setting up automatic transfer of data to ARES
 - iii) CARS → NF: debugging of the instrument, characterization of lidar parts, calculation of the uncertainties and correction factors, provision of spare photometer, other as needed
 - iv) CARS + ARES → NF: feed-backs on technical aspects
- e) CARS + ARES → HO: **objective and timely** reporting on the NF progress
- 6) Provision of SAMU operation support to NFs
 - a) SAMU → NF: **easy access** to updated guidelines and tools **related to access** through
 - b) SAMU → NF: support in advertising the services and improving their visibility and discoverability to ensure maximum use of all ACTRIS resources
 - c) SAMU → NF: **timely and efficient** support to optimize the access management through PASS (platform for managing access to ACTRIS services)
 - d) SAMU → NF: support to receive and process user feedback after the access provision

3.2 Testing the workflows for the Aerosol In Situ component

Step1a: Initial acceptance as National Facility

- 1) Submission of the application by the NF
 - a) HO: **functionality** of the online submission system
 - b) ECAC-CAIS+In Situ DC+ASC DC: **clear requirements and criteria** to be initially accepted (step 1a) as Aerosol InSitu NF
 - For observational platforms, at least the set of 4 core variables+ 1 optional variable¹ measured at the platform – need to be defined to exploratory platforms.
 - Acquisition of all requested ancillary data (diagnostic variables and sampling conditions)
 - Commitment to participate in TC organized calibration/inter-comparison workshop for each variable after initial acceptance
 - A nominated PI and a nominated deputy
 - IT capacity to store locally all variables (incl. diagnostic variables and ancillary variables) requested in level 0 data files
 - Institutional support for long-term operation (space, personnel, spare parts and consumables, services for maintenance, travel to ECAC-CAIS events)
 - c) SAMU: **guidelines** about access definition, requirements and cost calculation
- 2) Evaluation of the application by ECAC-CAIS, (DC) In Situ or ASC, and SAMU
 - a) ECAC-CAIS + In Situ or ASC DC: **evaluation with respect to point 1, the ECAC recommendations** and scoring
 - b) SAMU: **evaluation as NF access provider** (Y/N and recommendations included)
- 3) Decision making
 - a) ECAC-CAIS + SAMU + In Situ or ASC: **agreement** on the general assessment
 - b) HO: promptitude and completeness of the communication with the NFs

Step1b: pre-operation and operation of the National Facility

- 4) Communication of CFs with the NFs
 - a) HO + ECAC-CAIS + In Situ or ASC DC: **functionality** of the Aerosol In Situ mailing lists, ECAC website and CAIS mini website (embedded into ACTRIS website)
 - b) HO + ECAC-CAIS + In Situ DC: easy and continuous **access** to information via the ECAC website, CAIS mini website (documents, announcements, repositories), and In Situ or ASC mini websites (data submission instructions and tools).
 - c) Annual Aerosol InSitu community meeting
 - d) submission of 2 years of QCed data for each evaluated instrument to In Situ or for exploratory platforms, submission of 10 fully QCed dataset gathering data from various instruments being evaluated.

¹ To be defined

- e) HO + ECAC-CAIS + In Situ or ASC DC: **effectiveness** of the sharing of responsibilities:
- Who is communicating what, to whom and through which channels
 - Who and what information is posted on the ACTRIS website
 - No duplicate information, no duplicate communication
- 5) Provision of CFs operation support to NFs
- a) ECAC-CAIS: **easy access** to updated SOPs, recommendations and e.g. NRT-tools
- ECAC-CAIS: ensuring easy and continuous access to updated SOPs, recommendations and tools regarding aerosol in-situ (on-line and off-line) measurements
 - ECAC-CAIS + In Situ DC: ensuring easy access to data processing chain's updated documentation (data workflow?)
 - In Situ DC: access to data production workflow tools for data processing, online and offline data submission, automatic (NRT) and manual QC, data curation.
 - ASC unit: access to data production workflow tools for data processing, data submission, data curation.
- b) ECAC-CAIS + In Situ or ASC → NF: **timely and efficient** support to setup, operate and optimize the instruments
- ECAC-CAIS → NF: consultancy to select / setup / upgrade the instrumentation
 - ECAC-CAIS + In Situ DC → NF: consultancy and training to setup observatories according to recommendations (including sampling, measurement, data acquisition, data submission, etc ...)
 - ECAC-CAIS → NF: timely and efficient consultancy and training to install/implement QA tools at the NF
 - ECAC-CAIS + In Situ DC → NF: timely and efficient consultancy, training and support for setting up real-time data delivery to DC
 - ECAC-CAIS → NF: instrument optimization, characterization and tweaking, support to calculation of uncertainties and correction factors, help with spare parts, provision (or recommendation for purchasing) of reference material
 - ECAC-CAIS → NF: feedback on technical aspects
- c) ECAC-CAIS + In Situ DC → NF: **timely and efficient** QA/QC of the measurements and data
- NF ↔ ECAC-CAIS + In Situ DC: closure exercises to assess the on-line instruments' performance, near-real-time data processing, quality control of the data products, data traceability, data access
 - NF ↔ ECAC-CAIS: calibration and/or inter-comparison of the various instruments (physical and remote access)
 - In Situ DC: continuous data production, quality control (NRT) of the data products, data traceability, data access.
- d) ECAC-CAIS + In Situ → HO: **objective and timely** reporting on the NF progress s
- 6) Provision of SAMU operation support to NFs
- a) SAMU → NF: **easy access** to updated guidelines and tools **related to access** through
- b) SAMU → NF: support in advertising the services and improving their visibility and discoverability to ensure maximum use of all ACTRIS resources
- c) SAMU → NF: **timely and efficient** support to optimize the access management through PASS (platform for managing access to ACTRIS services)
- d) SAMU → NF: support to receive and process user feedback after the access provision

3.3 Testing the workflows for the Cloud Remote Sensing component

Step1a: Initial acceptance as National Facility

- 1) Submission of the application by the NF
 - d) HO: **functionality** of the online submission system
 - e) CCRES + CLU: clear requirements and criteria to be initially certified as CRS NF
 - All 4 required instruments available at the station (or realistic plans for installing these within 2 years)
 - A nominated PI and a nominated deputy
 - At least one skilled operator, commitment for at least 2 years
 - IT capacity to store locally, and to transfer to CLU, level 0 data
 - Institutional support for long-term operation (space, personnel, spare parts and consumables, services for maintenance, travel to CCRES-CLU events)
 - f) SAMU: **clear guidelines** about access definition, requirements and cost calculation
- 2) Evaluation of the application by CCRES, CLU and SAMU
 - a) CCRES + CLU: **objective evaluation** and scoring (arguments and recommendations included)
 - b) SAMU: **evaluation as NF access provider** (Y/N and recommendations included)
- 3) Decision making
 - a) CCRES + CLU + SAMU: **agreement** on the general assessment
 - b) HO: promptness and completeness of the communication with the NFs

Step1b: pre-operation and operation of the National Facility

- 4) Communication of CFs with the NFs
 - a) HO + CCRES + CLU: **functionality** of CRS communication and CCRES mini website (embedded into ACTRIS website)
 - b) HO + CCRES + CLU: easy and continuous **access** to information via the CCRES mini website (documents, announcements, repositories)
 - c) HO + CCRES + CLU: **effective** sharing of responsibilities:
 - Who is communicating what, to whom and through which channels
 - Who and what information is posting on the ACTRIS website
 - No duplicate information, no duplicate communication
- 5) Provision of CFs operation support to NFs
 - a) CCRES + CLU: **easy access** to updated SOPs, SQAPs, guidelines and tools
 - CCRES: ensuring **easy and continuous** access to updated SOPs, guidelines and calibration tools for all instruments
 - CLU: ensuring easy access to updates in data transfer and processing chain documentation
 - b) CCRES + CLU → NF: **timely and efficient** support for instrumentation setup and operation
 - CCRES → NF: consultancy to setup / purchase / upgrade the instrumentation
 - CLU → NF: consultancy and training for data provision
 - c) CCRES + CLU → NF: **timely and efficient** QA/QC of the measurements
 - CCRES + CLU: **continuous** instrument calibration monitoring
 - CCRES: ensuring **easy and regular** access to radar calibration activities

- CCRES: **regular** assessment of instrument performance
- CLU: continuous data processing, quality control, data traceability, data access
- d) CCRES + CLU → NF: **efficient** support for optimising operations
 - CCRES → NF: timely and **efficient** consultancy and training for installing QA tools at NF
 - CLU → NF: timely and efficient support for setting up automatic transfer of data to CLU
 - CCRES + CLU → NF: timely and **efficient alerting** of instrument issues
 - CCRES + CLU → NF: provide **regular** technical feed-back
- e) CCRES + CLU → HO: **objective and timely** reporting on the NF progress
- 7) Provision of SAMU operation support to NFs
 - a) SAMU → NF: **easy access** to updated guidelines and tools **related to access** through
 - b) SAMU → NF: support in advertising the services and improving their visibility and discoverability to ensure maximum use of all ACTRIS resources
 - c) SAMU → NF: **timely and efficient** support to optimize the access management through PASS (platform for managing access to ACTRIS services)
 - d) SAMU → NF: support to receive and process user feedback after the access provision

3.4 Testing the workflow for the Reactive Traces Gases In-Situ component

Step1a: Initial acceptance as National Facility

- 1) Submission of the application by the NF
 - a) HO: **functionality** of the online submission system
 - NF to be labelled sends request to HO
 - SAMU passes request to CiGas
 - b) CiGas : **clear requirements and criteria** to be initially certified as CiGas NF
 - Check of minimum requirements for NF: for observational platforms, measurements of 6 VOCs and NO_x, all required instruments available at the station (or realistic plans for installing these within 2 years). [Minimum requirements for chambers – to be defined]
 - Provision of general NF information to CiGas: organization, type of NF, equipment; specific for observational NFs: local meteorology and pollution sources
 - A nominated PI and a nominated deputy
 - At least one skilled operator, commitment for at least 2 years
 - Commitment to participate in calibration/inter-comparison workshop for each variable after initial acceptance
 - Institutional support for long-term operation (space, personnel, spare parts and consumables, services for maintenance, travel to CiGas events)
 - c) “In-situ” DC (NILU) or ASC DC:
 - IT capacity to store locally, and to transfer to “In-situ” DC (NILU) or ASC DC level 0 data, and generation of level 2 and level 3 data (for exploratory platforms).
 - IT capacity to transfer data in NRT for observational platforms
 - d) SAMU: **clear guidelines** about access definition, requirements, and cost calculation
- 2) Evaluation of the application by CiGas, “In-situ” DC (NILU) or ASC DC, and SAMU
 - a) CiGas: **objective evaluation** and scoring (arguments and recommendations included) with respect to: instrumentation, documentation, air inlet system, quality control measures at the NF,
 - b) “In-situ” DC (NILU) or ASC DC: **objective evaluation** and scoring (arguments and recommendations included) with respect to: data management and submission
 - c) SAMU: **evaluation as NF access provider** (Y/N and recommendations included)
- 3) Decision making
 - a) CiGas + “In-situ” DC (NILU) or ASC DC + SAMU: **agreement** on the general assessment
 - b) CiGas+ “In-situ” DC (NILU) or ASC DC + HO: **objective** reporting on the NF progress and recommendations
 - c) HO: **promptitude and completeness** of the communication with the NFs CiGas+ “In-situ” DC (NILU) or ASC DC

Step1b: pre-operation and operation of the National Facility

- 4) Communication of CFs with the NFs
 - a) HO + CiGas + “In-situ” DC (NILU) or ASC DC: **functionality** of mailing lists and mini website (embedded into ACTRIS website)
 - CiGas: easy and continuous **access** to information via the CiGas mini website (documents, announcements, repositories), and DC mini websites (data submission instructions and tools).
 - CiGas: community meeting
 - CiGas + DC + NF: **timely and efficient** communication via an issue tracker
- 5) Provision of CFs operation support to NFs
 - a) CiGas + DC (NILU) or ASC DC: **easy access** to updated SOPs, guidelines and software tools
 - CiGas: ensuring easy and continuous access to updated SOPs, guidelines and tools for all the reactive trace gases and NOx variables measurements
 - DC: ensuring easy access to data processing chain’s updated documentation and the templates for data submission
 - CiGas + DC: **timely** support to setup and operate the instruments
 - b) CiGas + “In-situ” DC (NILU) or ASC DC: **timely and efficient consultancy**
 - CiGas: consultancy to setup / upgrade the instrumentation / training (remote/virtual/physical)
 - CiGas+ DC: QA/QC consulting for measurements and data analysis
 - CiGas+ DC: efficient support to optimize instrument operation, data evaluation, data management
 - c) CiGas + “In-situ” DC (NILU) or ASC DC → HO: **objective and timely** reporting on the NF progress
- 6) Provision of SAMU operation support to NFs
 - a) SAMU: **easy access** to updated guidelines and tools **related to access** through CiGas
 - b) SAMU: support in advertising the services and improving their visibility and discoverability to ensure maximum use of all ACTRIS resources
 - c) SAMU: **timely and efficient** support to optimize the access management through PASS (platform for managing access to ACTRIS services)
 - d) SAMU: support to receive and process user feedback after the access provision

3.5 Testing the workflow for the Reactive Trace Gas Remote Sensing component

Step1a: Initial acceptance as National Facility

- 1) Submission of the application by the NF
 - a) HO: **functionality** of the online submission system
 - b) CREGARS + GRES: **clear requirements and criteria** to be initially certified as TGRS NF
 - At least one of the required instruments available at the station and realistic time schedule for installing missing components in max. 2 years
 - A nominated PI and a nominated deputy with long-term commitment (nominally at least 4 years)
 - At least one skilled and trained operator, commitment for at least 4 years
 - IT capacity to transfer to CREGARS CDPS L1 data. NF can opt to store L0 locally or at GRES.
 - Institutional support for long-term operation in agreement with CF requirements (space, personnel, spare parts and consumables, calibration exercises, services for maintenance, participation to CREGARS events and – if required- travel or shipment of instrument to calibration facilities and/or participation to calibration campaigns, trainings, etc.)
 - c) SAMU: **clear guidelines** about access definition, requirements and cost calculation
- 2) Evaluation of the application by CREGARS and SAMU
 - a) CREGARS: **objective evaluation** and scoring (arguments and recommendations included)
 - b) SAMU: **evaluation as NF access provider** (Y/N and recommendations included)
- 3) Decision making
 - a) CREGARS + SAMU: **agreement** on the general assessment
 - b) HO: promptitude and completeness of the communication with the NFs

Step1b: pre-operation and operation of the National Facility

- 4) Communication of CFs with the NFs
 - a) HO + CREGARS + GRES: **functionality** of the TGRS mailing lists and CREGARS mini website (embedded into ACTRIS website)
 - b) HO + CREGARS +GRES: easy and continuous **access** to information via the CREGARS mini website (documents, announcements, repositories)
 - c) HO + CREGARS +GRES: **effectiveness** of the sharing of responsibilities:
 - Who is communicating what, to whom and through which channels
 - what information is posted on the ACTRIS website, by whom and where
 - No duplicate information, no duplicate communication
 - d) CREGARS + GRES: **linking** central processing and QA/QC informative output to the CREGARS mini website
- 5) Provision of CFs operation support to NFs
 - a) CREGARS + GRES: **easy access** to updated SOPs, guidelines and tools
 - CREGARS: ensuring easy and continuous access to updated SOPs, SQAPs, guidelines and tools for O3DIAL, FTIR, Pandora, MAX-DOAS and SOAZ.

- CREGARS: ensuring easy access to data processing chain's updated documentation
- b) CREGARS → NF: **timely and efficient** support to setup and operate the instruments
 - CREGARS → NF: consultancy and training to setup / purchase / upgrade the instrumentation
 - CREGARS → NF: consultancy and training to facilitate calibration requirements
 - CREGARS + GRES → NF: timely and efficient consultancy, training and support for setting up automatic transfer of data to CREGARS.
- c) CREGARS + GRES → NF: **timely and efficient** processing and QA/QC of the measurements and data
 - NF → CREGARS → NF: expert analysis of the QA tests to assess the instrument performance
 - CREGARS → GRES: continuous data processing, quality control of the data products, data traceability documentation, data access.
 - NF → CREGARS → NF: provide calibration of the instruments (directly and indirectly)
 - GRES: establish and monitor data flow between CREGARS units, CREGARS QA/QC node, DC and international networks such as Pandonia and NDACC
- d) CREGARS + GRES → NF: **efficient** support to optimize the operations
 - CREGARS → NF: timely and efficient consultancy and training to install QA tools at the NF
 - CREGARS → NF: debugging of the instrument, other as needed
 - CREGARS + GRES → NF: feed-backs on technical aspects
- d) CREGARS + GRES → HO: **objective and timely** reporting on the NF progress
- 6) Provision of SAMU operation support to NFs
 - a) SAMU → NF: **easy access** to updated guidelines and tools **related to access** through
 - b) SAMU → NF: support in advertising the services and improving their visibility and discoverability to ensure maximum use of all ACTRIS resources
 - c) SAMU → NF: **timely and efficient** support to optimize the access management through PASS (platform for managing access to ACTRIS services)
 - d) SAMU → NF: support to receive and process user feedback after the access provision

3.6 Testing the workflow for the Cloud in Situ component

Based on CIS approved time schedules, labelling pilots are expected to start in 2023/24 once the participating NFS are ready and QA measures and procedures are in place.

The following process is a rudimentary framework that will be specified and revised over the next months. Especially the details of the specific requirements during proposal evaluation and pre-operation will be defined further.

1. NF applies via “NF application tool/portal”
2. HO:
 - a. checks of formal examination (country, admissibility, etc.)
 - b. forwards application to
 - i. TC CIS
 - ii. SAMU
 - iii. In Situ DC
3. SAMU: Evaluation & Decision & Feedback to HO
4. In Situ DC: Evaluation & Decision & Feedback to HO
5. TC CIS: Evaluation
 - a. CIS Management informs the CIS units
 - b. CIS units check the requirements / application (contact with NF for clarification possible), feedback to the board
6. TC CIS: Decision:
 - a. Agreement on the general assessment
 - b. Reporting to HO
7. HO: Decision
 - a. Final decision based on TC CIS, In Situ DC & SAMU Feedback
 - b. Informing NF, if approved → info to TC CIS & NF
8. NF can start labelling process accompanied by TC CIS units
9. TC CIS will accompany the NFs until the NF meets all requirements
 - a. includes labelling audit at the NF
 - b. audit of QA, SOPs, data flow and other requirements
 - c. data reporting to Data Centre (together with In Situ DC)
 - d. reporting of NF status
 - e. reporting of final labelling/ end of process

All steps must be checked for functionality, effectiveness, objectivity, time, and cost.

3.7 Testing the workflow for chamber operation

As the interim ASCC is not yet in place, the specification of the workflow will be available later. In particular, a further testing workflow is needed for checking properly the specifics related to the chamber operation and submission of respective datasets. While the individual instrumental part is indeed object of the previous sections 3.2 and 3.4, jointly with observational platforms, there are several chamber specific parameters and meta-data needed to ensure the quality assurance and quality control for chamber datasets.

In this context ASCC will define, also based on the procedures developed in EUROCHAMP 2020, requirements for simulation chamber standard experiments, auxiliary mechanism provision, and other chamber specific meta-information.