Deliverable 7.2: Recommendations for implementing access to ACTRIS services

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Work package no	WP7
Deliverable no.	D7.2
Lead beneficiary	CNRS
Deliverable type	X R (Document, report) ☐ DEC (Websites, patent filings, videos, etc.) ☐ OTHER: please specify .....
Dissemination level	X PU (public) ☐ CO (confidential, only for members of the Consortium, incl. Commission)
Estimated delivery date	M46
Actual delivery date	29/12/2023
Version	Final
Reviewed by	Anna Maria Johansson, members of the Interim RI Committee
Accepted by	
Comments	

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1. Abstract

ACTRIS is a large, highly distributed pan-European Research Infrastructure that has entered its implementation phase in 2020. The aim of the ACTRIS Implementation project (ACTRIS IMP) is to coordinate and accomplish the actions required for implementing a globally recognised long-term sustainable research infrastructure with operational services by 2025. A key objective of ACTRIS IMP is to implement, test and improve the ACTRIS service provision. Therefore, several pilots of access provision were offered through the transnational access (TNA) tool in ACTRIS IMP WP7. The present document builds on those TNA pilot experiences to provide recommendations for implementing access to ACTRIS services in the context of the operational phase of ACTRIS.

2. Introduction

Access provision in ACTRIS IMP had two main objectives. The first one was to provide TNA to selected ACTRIS services through high-quality access and user support, centrally managed in a coordinated and harmonized manner by the Service and Access Management Unit (SAMU). The second objective was to test, evaluate and improve the service provision in ACTRIS based on the feedback from the access key players (users, access providers, review panel and SAMU). The pilot TNA helped identify the bottlenecks in the current access process, improving it and establishing an efficient access provision for the ACTRIS operational phase.

The TNA pilot aims at supporting the implementation of the user access and service provision system, in collaboration with the activities in Task 6.4 “Organizing the ACTRIS user access and services provision system”, to optimize the overall access process within ACTRIS and improve the reliability of the overall services provision.

The organisation of access management and provision is based on the principles and tools developed in WP6, and is described in Deliverable D6.2: Report on the ACTRIS User support system.

The underlying technical concept is detailed in Milestone MS39 Definition of the pilot access process to ACTRIS facilities, including a description of the access management and the modalities of access during ACTRIS IMP and specific documents and templates needed to provide TNAs according to H2020 regulations also in alignment with the ACTRIS access and service policy.

An overall assessment of the TNA pilot activities undertaken by the project is detailed in Milestone MS7.6 Final assessment of the pilot access concept and process. It serves as a basis for providing recommendations for implementing access to ACTRIS services.

The H2020 ATMO-ACCESS project (Solutions for Sustainable Access to Atmospheric Research Facilities - GA number No 101008004) has also been very useful for testing the access provision system to distributed atmospheric Research infrastructures (RI) - ACTRIS, ICOS and IAGOS, on a large scale. The project is ongoing and supports the trans-national, physical and remote access to more than 50 operational European atmospheric research facilities of the ACTRIS, ICOS and IAGOS RIs . ATMO-ACCESS aims in

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particular at ensuring their optimal use through high-quality access and user support, centrally managed in a coordinated and harmonised manner, as well as the common improvement of their services. It is thus a suitable testbed for applying the user access and service provision system developed under IMP.

The recommendations included in this deliverable D7.2 are thus based on the processes and experiences reported in ACTRIS IMP WP7 deliverable D7.1 and related milestones, enriched by the ATMO-ACCESS experience up to now.

This report provides an assessment of the TNA activity during the ACTRIS IMP project, analyses the feedback received from the main TNA actors – SAMU, access providers, reviewers, and users - and addresses current open issues still to be solved, providing recommendations for a large-scale access provision in the ACTRIS operational phase.

3. Assessment of ACTRIS TNA pilot activity

3.1. Scope and objectives of WP7 pilot activity

In the ACTRIS IMP TNA pilot, 11 facilities were selected for testing the access to specific services, in order to: assess and improve the reliability of the overall ACTRIS service provision, increase the user trust, and expand the user base. The platforms were chosen to have a representative view of the diversity of facilities involved in ACTRIS and comprise Topical Centres (TCs), Data Centre (DC), National Facilities (NFs), or combined ACTRIS Facilities (NF-TC), located in 10 different countries.

The services accessible in ACTRIS IMP TNA pilot were particularly aimed at promoting excellent science, innovation, training, and new services. Enlarging the user base to new users or users from other domains, as well as to the private sector was also a target despite the limited amount of access units available.

The choice of participating facilities and services provided allowed evaluation of the service provision and access provision to optimize the user interaction, workflows and management, to optimise the system for user access and service provision by the different types of ACTRIS platforms (observational sites, simulation chambers, topical centres and data centre) to improve the reliability and facilitate the process. The experience gained is beneficial to prepare and implement the large-scale access provision system for users in the ACTRIS operational phase.

Three calls for access were launched within the frame of the project as illustrated in Figure 3.1 below.

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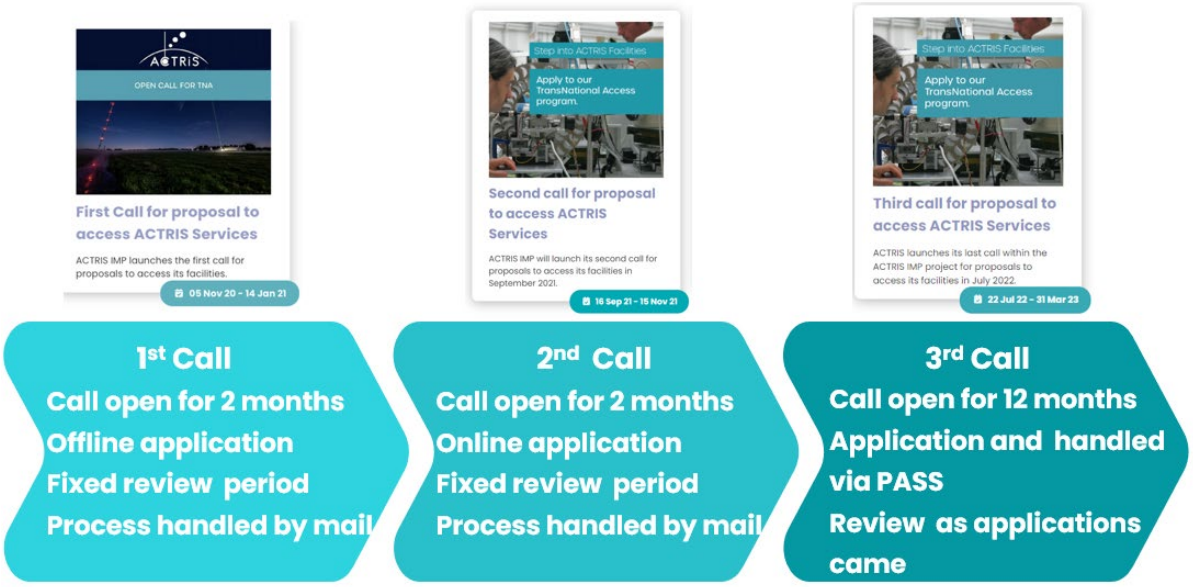

Figure 3.1: TNA Calls specificities within ACTRIS IMP

This format of calls fixed in time is meant to ensure a competitive selection according to Horizon 2020 TNA rules. In particular, it allowed WP7 to review the access process and organise feedback meetings with key actors to streamline the process which evolved from a project-based TNA management to an operational access management system via SAMU in the third call.

Overall, 58 proposals to the 11 facilities were received, out of which 49 were selected for access support and 46 were actually carried out (46 projects were foreseen in the grant agreement). More details can be found in MS44. The quantity of access provided since the beginning of the project equals 406 units of access corresponding to 143% out of the estimated access of 282 units foreseen in the contract.

While three - CARS Mobile AE, CABAUW, EUPHORE - out of 12 installations have not met their minimum quantity of access (CARS Mobile AE was not ready within the project, CABAUW did not host any TNA and EUPHORE had not enough access units yet to host another project). All other installations provided 100% of the estimated access or exceeded it.

80 users have benefitted from the opportunities offered through ACTRIS IMP TNA. 31% of the users were female researchers. Gender equality was promoted and taken into account in the evaluation process. This ratio is comparable with previous TNA projects involving ACTRIS facilities like ACTRIS-2 (H2020, 2015-2019) or EUROCHAMP-2020 (H2020, 2016-2020). All ACTRIS IMP users came from the Earth sciences and Environment domain, with the majority of users being expert scientists (63%) working mostly in university and public research organizations, with a small presence also from the private sector and the public sector (6% and 5% respectively). It is worth noting that 3 projects led by private sector users - MIRO Analytical

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AG at SMEAR, Aerosol doo at JHJ and Tofwerk at ACD-C/OGTAC CC - were submitted and awarded but only 2 were completed as one user withdrew its participation due to a timing issue.

Five user groups involving international users requested access to ACTRIS IMP TNA pilot. One project from Russia was withdrawn, one from Canada was not carried out and three were completed. The international users came from Argentina, Australia and Japan, demonstrating the world-wide interest in services provided by ACTRIS facilities.

Users mostly requested research services (46%) and technical services (43%). Data services account for 9%, and innovation services for 2%. Most users (57%) have requested remote access to ACTRIS Central Facilities (CF), mostly related to technical services. 17% have used hybrid access, a combination of physical and remote access which has become more and more present particularly in the post-COVID context.

3.2 Assessment of Access management system

Access management during the ACTRIS IMP project has evolved significantly from a completely offline process to a fully integrated online platform.

In the first call for TNA, user groups applied by sending a written application Word form. The various access steps (evaluation, acceptance/rejection letter, required documentation before and after access completion) were then managed by the TNA management team by email.

An intermediary solution was used in the second call for access. Based on the comments from the access providers and the reviewers , a revised version of the application, in online format, was developed via JotForm to ease the application process and also allow adjustment of the application form depending on the type of facility/service chosen and associated access mode. The other steps of the process were managed by email similarly to the first call.

For the third call, TNA was managed using the online and interactive ACTRIS PASS (Platform for managing user access to ACTRIS ServiceS, https://passactris.smapply.io) system, designed and developed specifically for ACTRIS to optimize the managerial process of ACTRIS access calls. PASS enables SAMU to supervise each step of the access process more efficiently, to engage all actors in one single platform, to create and adapt workflows that work for the specific requirements of different calls, and to reduce the workload (standard communications, exchange of documents). The PASS system and results from the testing are described in IMP MS38. The ACTRIS access workflow can be found in table 1 below, where the many different steps that are necessary in the process are indicated and all actors involved are identified. PASS has allowed to automatize the overall workflow and processes, and contributes significantly to gaining efficiency in the overall access process and access management. SAMU engages in constant efforts to improve the platform and its functionalities based on user feedback.

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Table 3.1: ACTRIS Access workflow

	Steps		Who?
1	Application stage		User
2	Eligibility review round	Check of the compliance of the project with respect to TNA rules and conditions. Financial support for travel and subsistence is proposed by SAMU to the service provider	SAMU
3	Feasibility review Round	Access provider checks that the TNA is feasible for the facility (technically, scientifically and fitting with the facility schedule). comments on the financial support to allocate to the user group	Service provider
4	Review feasibility - Yes	Valid proposals are assigned to the evaluators through various access methods.	SAMU
5	Review feasibility - No	Unfeasible proposals are ready for subsequent processing, i.e. communication of the refusal to users.	SAMU
6	Excellence-driven access Review stage		Evaluators
7	Technical need-driven access		Evaluators
8	Market-driven access		Evaluators
9	Training need-driven access		Evaluators
10	Assignment to rapporteur		SAMU
11	Rapporteur		Rapporteur
12	Recommendations to SAMU	Letters are sent to the user groups via PASS including results from review and potential financial support	SAMU
13	Declined		SAMU
14	Approved proposals: Acknowledgement of access terms		User

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	Preparing access	Travel, logistics onsite (reimbursement procedure depends on each facility)	User and Service provider
15	User notification of completed access		User
16	Confirmation of access		Service provider
17	Post access requirements	Scientific activity report (for research and training services) TNA user questionnaire	User
18	**Completed**		

3.3. Evaluation of the Feedback from the actors in the system

Documenting each step of the access process and testing the access workflow and functionalities has been one of the objectives of ACTRIS IMP TNA pilot. Meetings and feedback collection from the main actors involved – SAMU, access providers, reviewers, and users - were organised to discuss the concept and its efficiency and to identify remaining issues and potential solutions in order to further optimise the access process. The outcome of these specific meetings in this pilot activity are detailed in IMP MS44.

Furthermore, two questionnaires were used to gather feedback, one targeting ACTRIS access providers involved in ACTRIS IMP and ATMO-ACCESS to gather their views on the process, improvements, and bottlenecks, and the other addressed to users after access completion as part of the post-access documentation. The feedback received is reported in detail in ACTRIS IMP MS7.6. The key findings are presented below.

- ***SAMU***

The WP7 TNA management Team was composed of CNRS and CNR (SAMU). Several meetings and written exchanges were organised between the two teams to exchange information on the most effective access management practices, technical developments, and task sharing. The organisation of the access process was debated to find the right balance between effective application forms and gathering all the information needed for follow-up and reporting.

The share of responsibilities between CNRS and SAMU/CNR to ensure a smooth transition and to gradually shift the organization of the user access and service provision system to SAMU was an important discussion item. Main SAMU/TNA management team feedback on the transition to PASS is reported in ACTRIS IMP MS6.9.

- ***Access providers***

The dedicated meeting organised in 2021 with providers involved in IMP WP7 allowed to refine the access process, notably the application forms and better tailor the requested information. In addition, a survey

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was conducted in June and July 2023 to collect the access providers' feedback specifically on the access procedures. Throughout the pilot, SAMU has also been gathering ongoing written feedback.

According to this survey, the overall assessment of the TNA process is rated 3.8 out of 5. Several providers commented that the access organised in calls with a fixed deadline for application was not the most suited for their organisation of work. This may be a reason for the overall score received. It is worth noting that the modalities of the calls were specifically meant to test access provision workflows with IMP. The quite complex process may put some users off (like students) due to timing constraints. The providers suggested making the decision and review process more transparent when possible. The interactions between SAMU and providers on the one hand, and between users and providers on the other hand are both rated 4.4 out of 5. The responsiveness of SAMU was praised by the respondents.

A large majority (88%) of providers expressed satisfaction or neutrality towards the shift from offline to online TNA management. Some specific messages concerned technical issues related to PASS, which have been solved since thanks to the testing of workflows and interactions.

Nearly 80% of the respondents gave the website's information on TNA a positive review. Community meetings or specific webinars could be of use to explain the access guidelines and the platform. Some providers suggested having some examples of pre-compiled TNA application forms available for users (notably early-career scientists or non-EU researchers) to improve the quality of the proposals. The providers confirmed a main advantage of providing access in terms of visibility offered to the facility and the development of international partnerships. The benefits in terms of scientific findings and technological development are also often put forward.

The main challenges faced by access providers are caused by a limited capacity and availability of resources (personnel, space, logistics, costs) as well as the alignment of user requests in the scheduling of the facility operations. Administrative and logistical issues, as well as evaluation/ justification of the access costs have been evaluated to be less critical but could be facilitated by annual status reports of access provided by each facility involved in the access program (including TNA units spent by each facility and corresponding budget).

- ***Reviewers***

The reviewers commented on the process during the meeting in 2021 and by written exchanges with the access management team. These reflections helped streamline the process to ensure time-effective review and alignment between the application and evaluation forms. Four different types of applications and review forms have then been developed, depending on the type of facility/service chosen (and associated access mode), e.g., technological/data services provided by CFs (technical need-driven access mode) vs research/training/innovation services provided by observational or exploratory facilities (scientific excellence-based access mode). The review process evolved from an offline procedure via Excel evaluation forms to a fully integrated review form on PASS.

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The pool of reviewers appreciated the refinement of the evaluation process because it resulted in a better and more transparent evaluation system. The importance of communicating review criteria to users and providers is considered key to receiving high-quality proposals.

The discussions between SAMU and reviewers also helped overcome potential problems as some technical issues with the platform were reported and tackled in a timely manner. Improvement of information sharing - being able to access past reviews and scientific reports from reviewed TNA - would be a well appreciated improvement.

- ***Users***

The users' perspective was collected via a post-access feedback questionnaire sent to users who have implemented projects within ACTRIS IMP (initially done via an online form and then via PASS for the 3rd call). This feedback collection has been crucial to adapt and align the services offered with the user needs.

The users are overall very satisfied by the user access and service system developed during ACTRIS IMP, at all stages of the process (55% rated it excellent, 29% very good, 12% good). Communications actions and supporting documentation on how to apply were judged very satisfactory as well as the quality of the service accessed. Onsite support was also positively scored.

The level of details requested in the application form and post-access requirements evolved during the TNA pilot process. Users seem to prefer offline forms and judge the reporting on PASS more demanding. A clear description of the steps needed to complete all the requirements is necessary to ease the information collection.

The users' appreciation of the provided services by service providers is very satisfactory. The service received is the core objective for the users and is often rated higher than the process itself. It is worth noting that SAMU's role has become more prominent and appreciated during the project's lifetime. A majority of users are satisfied with the quality of the service received by SAMU and recognise its responsiveness.

The main suggestions for improvement are captured in section 5. To some users, notably regular ones requiring mandatory calibration technical services, the level of documentation required appears to become higher compared to before the implementation of PASS, as different types of application forms depending on the services selected were introduced in the third call. Some suggested introducing predefined options for access in the case of standard calibrations to simplify the process and eliminate some redundant fields – for recurrent users – in the application form. In ACTRIS IMP TNA pilot no distinction was made between users coming from NF and external users. This helped test the workflows of CF support. It is worth noting that mandatory calibrations for ACTRIS NFs will be out of the scope of the PASS operations and SAMU management and treated as operational support from the Topical Centres by

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the Operations Units of ACTRIS Head Office. For technical services to non-NFs, an evaluation process needs to stay but it will be reduced and simplified as much as possible depending on the capacity and resources of the CF.

The users commented that the organisation of calls with fixed deadlines may not be the most effective. A more flexible approach, with a rolling call open all year long with fixed review time, would be preferred by the users requiring these specific technological services.

Some issues regarding travel and subsistence reimbursement by local institutions were reported and thus explain some of the lower scores gathered. Clearer reimbursement rules were requested. Finding additional funding sources to cover the remaining part of the travel budget was also a challenge for some users (especially early career scientists), although it was clearly indicated in the calls that financial support to user mobility only provided limited support.

3.4. Evaluation of the access process

The process to access ACTRIS Services is documented in detail in ACTRIS IMP Deliverable 7.1 and is illustrated in Figure 3.2 below, concerning the central management and the different steps of the access life cycle: communication, selection process, and access reporting.

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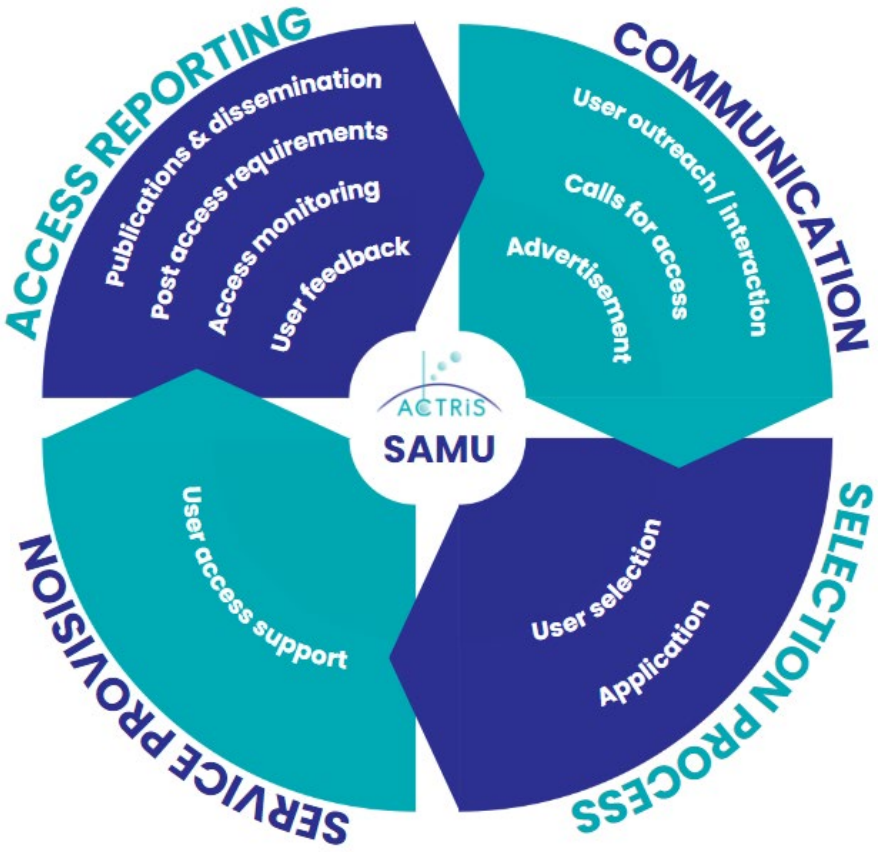

Figure 3.2. ACTRIS IMP access life cycle

Access management is the focal point, indispensable for efficient access provision and is centralised by ACTRIS SAMU which acts as the unique interface between the actors involved in service provision and users. This unique entry point for users is indispensable, particularly for distributed RIs like ACTRIS. The role of ACTRIS SAMU was described in section 3.2 above.

is key for promoting successful access to ACTRIS services to the users. It includes effective user outreach and efficient user interaction, the publicity for the calls for access and strong advertisement for the TNA opportunities. Opportunities for access are communicated through ACTRIS communications channels, newsletter and mailing lists, ENVRI cluster communications channels and related projects and networks. A specific section of the ACTRIS website is dedicated to open calls where the nature, focus, scope and timing are described.

Central communication from ACTRIS Head office communication manager and SAMU combined with access providers relays, are key in disseminating access opportunities. New communications pathways should always be thought of, and potential users should frequently and regularly be reminded about the opportunities of access - notably via the ACTRIS website and newsletter which are the doorways to ACTRIS

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communication. Automated emails to previous users who gave their consent to subscribe to access opportunities alerts in respect of the EU GDPR Regulation 2016/679 should also be put in place in operational ACTRIS.

Particular efforts should continuously be made to reach out as wide as possible and extend the user base, specifically to new user communities, e.g., to attract new users from non-atmospheric domains (environmental, health, energy domain, etc.), from non-traditional end users (public services, companies) or new regions and countries. Although challenging, this effort should be done in agreement with, and in close cooperation with ACTRIS innovation strategy.

Regular updates of the Catalogue of ACTRIS Services, which has been implemented by SAMU during ACTRIS IMP in strong collaboration with the access providers, is very important to provide users an easily searchable interface with the most precise description of ACTRIS services. Connecting the catalogue to PASS is foreseen in the future to ease the user experience, particularly in the future, when services will become accessible beyond specific TNA financing projects. This integration is poised to streamline access and navigation for users, ensuring a more seamless and user-friendly experience.

The **selection process** consists of the user application process and the user selection, made through a three-step review by SAMU (eligibility check), access provider (feasibility check) and the independent review panel (merit assessment). The review is done by a minimum of two, ideally three reviewers. One rapporteur is selected within those three to draw up a summary report of the individual assessments and formulate recommendations to SAMU for the selection. These 3 steps are implemented to ensure the conformity and quality of the proposals. Once the application is accepted, the user access can be organized.

Within IMP TNA pilot, final selection was done by comparing the grades given by each reviewer and analysing their comments. The reviewers sent their evaluation results and recommendations on the projects that should benefit from the TNA to SAMU which then centralized the review results. The role of rapporteurs should be stressed so that the comments they formulate could be shared with the users and the providers in the result letter. The number of demands in IMP TNA pilot was limited, in the case of larger access programmes, a fourth selection step could be necessary, with a selection board taking the final decisions on the selection of the TNA proposals. For access to NFs scientific excellence is sought for and the review helps to select the best proposals (independently of the access funding sources); access to CFs depends on the facility capacity and resources.

The application process is designed to be as light as possible for the users, while providing sufficient information for the review process. Application forms have been developed in cooperation with access providers on key information needed from their side – to avoid overloading users with questions depending on the type of service requested.

Users were strongly encouraged to contact the access provider prior to the application submission to select the correct type of service and to discuss the planned project to ease the review process.

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An effective sharing of information to the reviewers and access providers has been made possible through PASS despite some improvements that are still to be made. For instance, to have the possibility to maintain access to reviews and view the applications even after the review task is completed. Regular communications to reviewers and access providers to expose the process and periodic administration of feedback questionnaires should be organised by SAMU. Direct exchanges will also take place during ACTRIS community meetings.

In operational ACTRIS, the timing of the process should be efficient: each step should not exceed more than i) 5 days for the eligibility check, ii) 10 days for the feasibility check, and iii) two to three weeks for the independent review. The total application and selection process should not exceed 6-8 weeks and be minimized as much as possible. Additionally, fast-track access option with an adjusted review process should be considered, for instance in case of unexpected events or for private sector access. It is critical in the process to obtain representative and timely proposal evaluations. To do so, engaging a large pool of reviewers is necessary. Rewards or certificates which could be useful in the reviewers' career are envisaged to motivate the community.

Service provision is the phase where the user(s) get access and support by the operator of the facility to benefit from the service. Project leaders are notified of the outcome of the review via a reply letter accessible through PASS indicating the review results. Successful candidates may also receive financial support for travel and subsistence, the maximum amount granted is indicated in the letter.

The decision on financial support to the project results of interactions on a case-by-case basis between SAMU and access providers as a function of available money. Independent of the size of the research group, financial support was limited to maximum 2 equivalent persons per project. Financial support to T&S depended also on the ACTRIS facility and location, calculations were based on the availability of funding from the European Commission and on the applicable rates of the accounting practices of the institution in charge of the host infrastructure.

Prior to the access, users are requested to accept the TNA conditions, including the agreement to provide the required TNA documentation, the obligation to disseminate the TNA results and provide the data resulting from the TNA (except for SMEs), and confirm the avoidance of double financing by signing a user acknowledgement statement. They are then requested to contact the access provider to plan their access.

After the user receives a positive response, access support is organised via direct contact of the user with facility provider, SAMU doesn't intervene in this step. They organise the access (timing, organisation of travel and logistics) which could be more or less complex as a function of access type (physical, remote, hybrid).

Access reporting consists of access monitoring and tracking of access provision by SAMU, the collection of post-access documentation - confirmation of access , acquiring of the user feedback and improvement of the services based on comments received, and the process of publication, dissemination and data provision to the ACTRIS Data Centre resulting from the access by the users.

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Post-access documentation is gathered through PASS. To have a better view of the process, ideally access providers should be able to help the user in completing those tasks (i.e. activity report) and be acknowledged in any publications resulting from the access.

SAMU should regularly check the feedback collected for sharing the information with the actors concerned. These insights will be used to continuously adapt the catalogue of services to facilitate the system and process to the users' needs. Currently feedback questionnaires are systematically in place for users but a short feedback form available to providers and reviewers could furthermore be very useful.

SAMU is compiling statistics on access (operational metrics, user metrics…). An extensive list of Key Performance Indicators (KPIs) is detailed in IMP MS7.6. Tracking the evolution of those indicators will help assess the performance and success of the access programme during the operational phase of ACTRIS and establish trends on the use of ACTRIS services. Having a straightforward and automated way of extracting statistical data will be necessary to reply to documents or reporting needs of the RI.

4. Actions needed to enhance ACTRIS service provision

Seven main actions to enhance ACTRIS service provision were identified and should be tackled in the ACTRIS operational phase. They are currently missing or in progress or need to be extended to all the ACTRIS facilities beyond the pilot' scope. These actions aim at: i) improving the availability and access of results related to the access provision in terms of publications and data, ii) putting in place an agreement between access provider and users for defining their mutual rights and obligations, iii) transition to hybrid access, iv) reflections on the definition of access units used at the facilities (linked to the access cost calculations) particularly due to an increased hybrid access for which the traditionally used access units appear less appropriate, v) realisation of a full access cost analysis, vi) production of tutorials for both users and access providers to explain specific issues in relation to the access process; vii) refining the access process for a sustainable access program.

4.1 TNA results

After the end of the access project, users and providers must send back to SAMU the post-access documentation – now via PASS – including a confirmation of access and a scientific activity report from access to NF. This report is prepared by the user group in collaboration with the access providers.

For technical services provided by CFs, a corresponding document stating the details of service provided and information about instrumental and/or data requirements should be issued by the access provider. In some CFs, this document is not yet available to the users and NF beneficiaries. This service report is needed by each CF (unit), not only in TNA related activities but particularly for the operational support provided under ACTRIS ERIC. An example of a standardised template is proposed in Appendix A of this deliverable. It will have to be adjusted to each specific CF (unit) and its services.

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Furthermore, results from work carried out during access projects activity (e.g., publications, conference contributions) are collected by the ACTRIS Head office with the support of SAMU. The analysis of the results from TNA takes time and it is worth noting that the results are published with some time lag. Users and providers are asked to inform SAMU when a publication is released which is often 1-2 years after the actual TNA (and often after the end of the corresponding EU project). The collection of all publications remains challenging. Having a systematic tracking system using for instance keywords in Web of Science would be beneficial.

Users are encouraged to make available the data resulting from TNA projects for archiving and access via the ACTRIS Data centre (DC). The DC is not yet operationally integrating the functionality. However, tools have been developed in ATMO-ACCESS to submit the TNA data resulting from TNA activities via the "homeless data portal" and make them accessible via the ACTRIS DC. This ensures the data sets' long-term curation and promotes its visibility and access to a large research community. The homeless data set is to be handled according to the FAIR principles as far as possible; the service also includes DOI minting for the data sets if requested by the user. This "Homeless data portal" is open to past TNA projects PIs and can be accessed free of charge at this link https://www.atmo-access.eu/virtual-access/#/ during the entire project. Solutions are being sought to sustain this virtual access service in a more systematic manner.

4.2 Terms of use agreement

After acceptance of a user project, a specific agreement summarizing the rights and obligations of both access providers and users should be signed. An example of an outline of these terms of use agreement can be found in Appendix B of this deliverable.

By offering their services through ACTRIS, the access providers are committed to provide on-site support and advice to users in the project preparation, feasibility study, training, travel and subsistence support, logistics, space, data analysis. They also need to specify that specific insurance is provided by the users, and information related to the host institution's data management policy.

The terms of use agreement from the access providers informs the users on the requirements related to the onsite access, the logistical specificities, the support offered onsite, and reimbursement rules in case European project funding for user travel is available. The terms of use agreement is unique to each facility and should be prepared by the facility PI and its administration, and should address the following points:

- Compliance with ACTRIS Data Policy and the ACTRIS access and service policy.
- Compliance with the applicable legislation, institute' regulations, hygiene and safety rules, local data management process, etc.
- Confirmation of the users' responsibility to provide their own insurance.
- Confirmation to disseminate the results (via open access), including the recognition of the facility and personal contributions.
- Confirmation to provide data related to the TNA to ACTRIS DC.
- Other aspects (if applicable): e.g. specific protocols concerning transport and access to the facility.

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4.3 Moving to remote/hybrid mode

With travel restrictions hindered by the COVID pandemic and the growing concern about reducing emissions linked to travel, a transition from physical access to more remote and hybrid access to RI services has been promoted and observed in recent years. With the 1st call for access in ACTRIS IMP taking place in 2020 during/after the pandemic, when travel was still restricted in many countries, remote access had been strongly advertised both to the users but also to the access providers to encourage them to further develop their remote access capabilities at their facilities.

Remote access allows the user to benefit from the RI services without any user mobility by providing materials or instruments to be operated by the service provider in their facility, for example, or by co-designing experiments to be conducted at the host facility under the (remote) direction of the user. Remote access is efficient and convenient for the users as it extends the range of possibilities, including longer access visits.

This mode of access has great potential for the RI. It will help to enhance and make RI services more accessible while reducing the need for physical presence of the users at the facilities, reducing the footprint and increasing access inclusiveness as a result. It is worth noting that remote access works best when an existing relationship between provider and user is established. However, there are some limitations of remote access related to the facility capabilities in terms of staff overload and requirements for specific scientific and technical expertise (as these projects are often tailored access), technical requirements/scheduling, and impact on access costs. There is also a risk of not being able to answer all user requests. The related remote capabilities and significant additional efforts that are required are not easily available at certain types of facilities (e.g., simulation chambers).

In the case of hybrid access, the users often travel to the facility to set up and dismantle the instrumentation or for training, while the running of the measurements and associated work will be carried out remotely with the help of the facility staff.

From the access experience gained during the last years in the perimeter of atmospheric research infrastructures, hybrid access appears more adapted than remote to ensure an efficient access provision but appears not always to be more time-efficient. It is also not helping much in reducing the carbon footprint. However, it is very efficient when complex projects are implemented, especially those spanning over weeks and months, because it ensures better life-work balance for the participants. Overall, remote access may represent an alternative way of reducing physical mobility but is expected to remain of complementary value.

Lessons learned on this access type by other RIs or projects like eRImote will also be considered to improve remote service provision within ACTRIS.

4.4 Use of appropriate Access units

Based on experience from TNA provision under previous ACTRIS-related integrated activities (ACTRIS, ACTRIS-2, EUROCHAMP-2020), the following access units are typically used for the following facility types:

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- User working day (UWD): equivalence of one working day spent by one user at the facility to access the services (observational platforms)
- DAY: equivalence of one working day spent by one or several users at the facility to use its services, independent of the number of user (Atmospheric simulation chambers and some observational platforms)
- Staff working time (SWD, SWH): equivalence of one labour day/hour required by the facility staff person to provide the access to the services (all platforms)
- Other: one service provided, i.e.: one calibration (CAL: equivalence of time for calibration of one instrument at the facility) or one data processing service (DPS: equivalence of time for processing one set of data).

The right choice of unit for the service provision is important as a basis for access cost calculations and access tracking. Due to the increase of remote access, a reflection on the relevance of changing UWD to SWD or SWH for observational platforms should be performed as users are not physically present for remote access (and can no longer be measured in user working time). Furthermore, remote access often implies more work from the facility staff. In the ACTRIS IMP TNA Pilot, the project was initially mostly designed for physical access to the observational facilities. To apply a harmonised unit of access in case of hybrid access, the access providers were asked to assess the time their staff dedicated to the TNA provision and to calculate the equivalent number of UWD or DAYs.

The use of a more 'generically' applicable access unit such as SWD would allow for more flexibility in cases of combined physical and remote or hybrid access.

4.5 Tracking access costs

The costs for access to the facilities should always be known and monitored at regular intervals. Access costs comprise the direct and indirect costs incurred by the ACTRIS CFs and NFs for the provision of ACTRIS services to the users. Knowledge of the unit access costs for access provision to the facilities, depending on the different service types provided and on the access type (physical/remote/hybrid), will be important to ACTRIS in the operational phase to be able to i) respond in an agile manner to future INFRA-SERV call opportunities and ii) develop a pricing scheme for users that allow to cover the costs for access provision that cannot be covered by European funding (for example an optimal synergy of regional/ national funding, RI funding, user fees).

4.6 Tutorials (for users, providers)

Improved support, documentation, and guidance for applicants and for providers using the platform have proved to be necessary and useful.

The various steps in the access process are not always easily understandable, particularly for new users. Improved, short and precise documentation would be useful for users to navigate through the

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system. Currently, on the PASS homepage, applicants can find guidelines on how to create their account on the platform: https://passactris.smapply.io/res/p/applicant-guidelines/

A Frequently Asked Questions (FAQ) page is also available to guide users on specific topics like eligibility, costs or type of access: https://passactris.smapply.io/res/p/faq/ This page is open to all but only visible in the menu when applicants create a profile.

The user forum (Science and User Access Forum | ACTRIS) was created during ACTRIS IMP as a place where users can exchange and discuss their needs and expectations regarding access and use of the ACTRIS services. Besides, in operational ACTRIS, SUPRA – SAMU User helpdesk function for Physical and Remote Access - is implemented to provide a central information and contact point on all access-related aspects to users and providers

In the future, some short video tutorials and/or explanatory webinars on particular access topics or where users can directly ask questions to SAMU could be beneficial. Presentation of the procedures, training sessions on how to write a "good" proposal and adapt to the targets of the access calls could be exposed and a link to the video added directly on the PASS platform.

According to the survey, access providers are willing to benefit from specific explanations about the process and PASS, and notably on the steps where they need to react. They favour short explanatory information provided via a document or a webinar.

4.7 Refining the access process for a sustainable access process

The roles of each party (SAMU, user, reviewers, rapporteur, provider) in each step and the workflows are described in ACTRIS IMP D6.5 ACTRIS Access Management Plan. The selection criteria and the timeline of the project calls and selection in operational ACTRIS (not in a EU project context) as well as identifying the optimal combination of funding sources for a sustainable access program must be clearly defined in the context of large access provision. This should be discussed within ACTRIS RI committee at a later stage to ensure the most user friendly approach, ensuring it is consistent with the resources available.

5. Recommendations and conclusion

For implementing the access provision in the ACTRIS operational phase and following a thorough analysis and assessment of pilot activity, the main recommendations are summarised and proposed in the following.

- Clear and wide communication on the services offered, the available calls, and access process (aligned with the ACTRIS access and data policy) should be ensured by SAMU in close collaboration with the ACTRIS Head Office communications manager. Facility providers are key relays in disseminating access opportunities. Information about what is covered by the access, evaluation procedure and criteria, and potential grants for travel should be easily findable on the

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ACTRIS website. User-friendly FAQ, short tutorials and/or webinars should be organised to support users and providers during the application writing phase.

- Connecting the ACTRIS Catalogue of services to PASS will enable users to look for the service they need, and immediately request it via PASS. Access providers should be encouraged to systematically review their description in the catalogue of services and update the information as necessary.
- The organisation of calls with a fixed end allows competition and selection of the best proposals. However, a possibility of accessing platforms in specific cases should remain available (e.g., fast-track access). In operational ACTRIS, regular access calls with fixed submission deadlines (e.g., biannual) should be implemented to provide ample opportunities to submit proposals.
- SAMU should make the application process as light as possible for the users while ensuring that all information needed by SAMU, access providers, and reviewers is collected. In ACTRIS operational phase, providers - notably Central facility (units) - which have not yet been involved in TNA activities should be consulted on the form design for providing access to users outside the ACTRIS NF scope.
- An effective process should be sought to select excellent scientific or technical proposals while ensuring a smooth access provision and a maximisation of the impact. The duration of the selection process should not exceed two months for research after call closes, technical and training services, and one month or less for innovation services to reduce the barrier for the private sector users.
- Continuous advertisements to enlarge the pool of reviewers. Availability of sufficient experts from all ACTRIS domains is crucial, particularly to ensure a time-efficient process and reduce the burden to the individual reviewers. Rewards could be envisaged to motivate potential reviewers.
- A centralised travel and subsistence budget to support users' mobility is preferred to allow better flexibility among the users but the administrative effort is high. If managed at facility level, an easy and consistent system of reporting costs needs to be designed to allow a better tracking of these expenses by the SAMU.
- A terms of reference agreement should be signed for each access project with the users stating their rights and obligations for the purposes of the access.
- Specific reflection by TNA PIs at facility level regarding units of access used taking into regarding the increasing use of remote and hybrid access should be carried out. The access unit applied should be representative for the service provided regardless of the access type chosen (physical remote or hybrid access).
- The access providers should continuously track the full costs of access necessary to allow developing a sustainable access cost model and pricing scheme that can be applied in the operational phase.
- Post-access documentation should be collected in a timely manner and the feedback collected analysed and used to improve the process. Reminders to collect dissemination of the TNA results and on data provision to ACTRIS DC should be sent on a regular basis.
- Meaningful service reports for technological and data services provided by the Central Facilities should be developed.

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- Finding an effective way of extracting statistics on access to be able to respond promptly to requests is necessary.
- In the user feedback form, SAMU should collect user consent for being included on an "access"/"user" mailing list managed by ACTRIS ERIC for further requests or communications.

6. Reference documents

1. ACTRIS PPP Deliverable D2.3: ACTRIS Data policy
2. ACTRIS PPP Deliverable D2.6: ACTRIS access and service policy
3. ACTRIS IMP Grant Agreement (N° 871115)
4. ACTRIS IMP D6.2: Report on the ACTRIS User support system
5. ACTRIS IMP MS6.5 2nd draft of the ACTRIS Management Plan
6. ACTRIS IMP MS6.2 Detailed description of ACTRIS Service catalogue
7. ACTRIS IMP MS6.9: Results of the testing of the access and services provision system
8. ACTRIS IMP D6.5 ACTRIS Access and Service Management Plan
9. ACTRIS IMP MS7.1 Definition of the pilot access process to ACTRIS facilities
10. ACTRIS IMP D7.1 Recommendations for optimizing the access process and user interaction
11. ACTRIS IMP MS7.4 Intermediate assessment of the pilot access concept and process
12. ACTRIS IMP MS7.6 Final assessment of the pilot access concept and process
13. European charter of access for research infrastructures - Publications Office of the EU (europa.eu) Publications Office of the European Union, 2015. ISBN: 978-92-79-45600-8, doi: 10.2777/524573, KI-04-15-085-EN-N.

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Appendix A: Service report

The template for technical service certificate can be used and adapted to the Topical centre need.

Facility	**To:**	**TNA Project Leader**
[Access Provider Name]		[Name of TNA project leader]
[Name of Facility]		[Home institution and address]
[Name of Service Provider]	**Cc.:**	**SAMU** **samu.imaa@cnr.it**
[Address of Service Provider]		

Certificate of Technical Service Provision

XXXX [name of the service, es. Calibration, Isotope analysis, etc.]

ACTRIS IMP Transnational access

I, as access provider, herewith confirm that the following service was delivered at the Facility/installation above-named, in the framework of the ACTRIS IMP Trans-national access:

TNA project acronym:	.....
User Group Leader	
Service provided	[short description of the provided service, where applicable including details of: • the instrument/s - samples, • operations performed • processes carried out • outcomes and results (overall assessment)]
Date of provision	
Notice and recommendations to user	[i.e., next calibration and/or other important information)

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Access type:	☐	Physical access	☐	Remote access	☐	Combination of Physical and Remote access	

The amount of access delivered to the user group is as follows:

	Participant name	**Access** (start-end date)	**Unit of access** (physical access)	**Amount of accces** (physical access)	**Unit of access** (remote access)	**Amount of accces** (remote access)
User group leader		[dd/mm/yyyy-dd/mm/yyyy]	(i.e. SWD, DAY)		(i.e. SWD, DAY)	
User 1:						
User 2:						
User ...:						
Total amount of access provided to project user group:						

REMINDER: *the following acknowledgement sentence is mandatory for all publications:*

Authors acknowledge the [Name of Facility] for providing the [Name of service]. The [Name of Facility] is part of the ACTRIS IMP project supported by the European Commission under the Horizon 2020 – Research and Innovation Framework Programme, H2020-INFRADEV-2019-2, Grant Agreement number: 871115"

[Location], [Date dd/mm/yyyy] [Signature of access provider]

Appendix B: Outline of Term of use agreement

The term of use agreement is unique to each facility and should be prepared by the facility PI and its administration.

Facility	**To:**	**TNA Project Leader**
[Access Provider Name]		[Name of TNA project leader]
[Name of Facility]		[Home institution and address]
[Name of Service Provider]	**Cc.:**	**SAMU** **samu.imaa@cnr.it**
[Address of Service Provider]		

Access Terms of use agreement

Your access project has been accepted [if applicable, add *"and you are granted financial support by XXX to facilitate the execution of the project"*]. Please find below the useful information you need to help you prepare your access project.

- **User obligations**: Your project must comply with the **ACTRIS Data Policy** and the **ACTRIS access and service policy**.
  - Remind the user of the steps needed to ensure an efficient access process:
  - *Before your visit:*

    Fill in the Acknowledgement of access terms (including insurance policy) on PASS
  - *At the end of your visit (before you leave the facility):*

    Notify access completion through PASS
  - *Within 2 weeks after the end of your TNA*

    The project PI is requested to provide all mandatory TNA reporting documents within a reasonable time frame after the end of the TNA. All documents will be submitted through PASS including the following documents:
- TNA feedback questionnaire
- Scientific activity report.
- Submit the TNA data to the ACTRIS Data Centre

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- Additionally, any results from work carried out under this activity (e.g., publications, conference contributions) must be reporting to the SAMU (samu@imaa.cnr.it) and must acknowledge the project and support of the European Commission as follows: "This [infrastructure] [insert type of result] is part of a project that has received funding from *[project details]*."

- **Facility onsite support**
  - *Description of the support offered to the users in terms of* project preparation, feasibility study, training, travel and subsistence support, logistics, space, data analysis.
  - Inform about specific local Data management plan procedure.
- **Specific procedures**
  - Inform of applicable legislation, institution' regulations, hygiene and safety rules
  - Inform users in advance in case they need to apply for specific clearance and if ID /badges are needed to access the site.
  - Insurance policies and responsibility.
  - If applicable: specific protocols concerning transport and access to the facility.
  - Include facility main contacts (email/phone) and emergency contacts (112…)
- **Logistics and accommodation**
  - Description of how to reach the facility including a map if feasible.
  - List accommodation options close to the facility
- [if applicable, add "**Reimbursement procedures** (in the frame of an EU project) in line with the hosting institute's administration procedures to ensure smooth use of the TNA grant:
  - Information / paperwork needed before the visit.
  - Information / paperwork requested to justify the expenses]

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