Milestone 2.6: Refined risk management plan

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Content

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1. Purpose of the document

The purpose of the document is to revise the ACTRIS risk management plan (RMP) at mid-term stage of the ACTRIS implementation phase. An initial version was developed during the ACTRIS PPP (Preparatory Phase Project) in October 2019, summarized in deliverable ACTRIS PPP D1.2. The processes linked to the implementation of ACTRIS as an operational infrastructure require an update of the risk management plan, particularly necessiting a regular revision of the risk registry to ensure that all relevant risks and potential impacts at each stage of ACTRIS implementation and/or operation are up-to-date.

2. Introduction

Monitoring and reviewing of risks at each stage of the lifetime of ACTRIS is essential and is closely linked to the reporting and performance monitoring of all activities relevant to the infrastructure. Risk management is an ongoing process and requires tools and strategies to constantly identify, analyse, evaluate and mitigate the potential risks which are evolving. ACTRIS is currently in a crucial phase of implementation, where the establishment of ACTRIS as an ERIC is being prepared, the ACTRIS National Facilities (NF) and Central Facilities (CF) are being constructed and upgraded, the labelling process is being organised, and the operation support and service provision are being set up.

In pursuing the ACTRIS risk management strategy, the refined management plan is an update of the initial version of the ACTRIS RMP and particularly focuses on the risk registry. It is considered a living depository of pertinent risks that require monitoring and updating on a regular, e.g., annual basis and is presented in section 4 of the document. The ACTRIS risk registry identifies and describes all risks relevant for ACTRIS as a research infrastructure, and provides an assessment of each risk, its likelihood and impact of occurrence as well as the proposed mitigation actions and planned responses. For completion, the basic risk management framework and process, the role of the different ACTRIS bodies in the risk decision-making process, and the related contingency measures and principles are shortly recalled and described in section 3. The relevant documents produced since the ACTRIS preparation phase to date are listed in section 5 of the document.

3. ACTRIS Risk management framework

This section summarizes and recalls the overall risk management process as it has been defined in the first version of the ACTRIS RMP prepared during the preparatory phase (PPP D1.2). It furthermore includes the updated description of the contingency process and principles as well as the related responsabilities and roles from the ACTRIS contingency plan for the implementation phase (IMP D2.1).

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3.1 Risk management process and perimetre

The risk management framework defines the process that helps identifying and anticipating risks, evaluating their effect on the ACTRIS operations, and providing a plan of action to eliminate and reduce those effects and tackle them to ensure successful outcomes. The risk management process involves the following steps (figure 1):

- **Risk assessment** which includes the identification of the potential risks, an analysis of the risks to estimate their probability and fallout, and evaluation by deteriming its likelihood and potential effect.
- **Risk treatment** examines the potential solutions to control, treat or mitigate the risks.
- **Monitoring and communication** are essential to determine whether the initiatives are effective, or updates are required. Successful risk management needs efficient communication and reporting of potential risks arising or materializing.

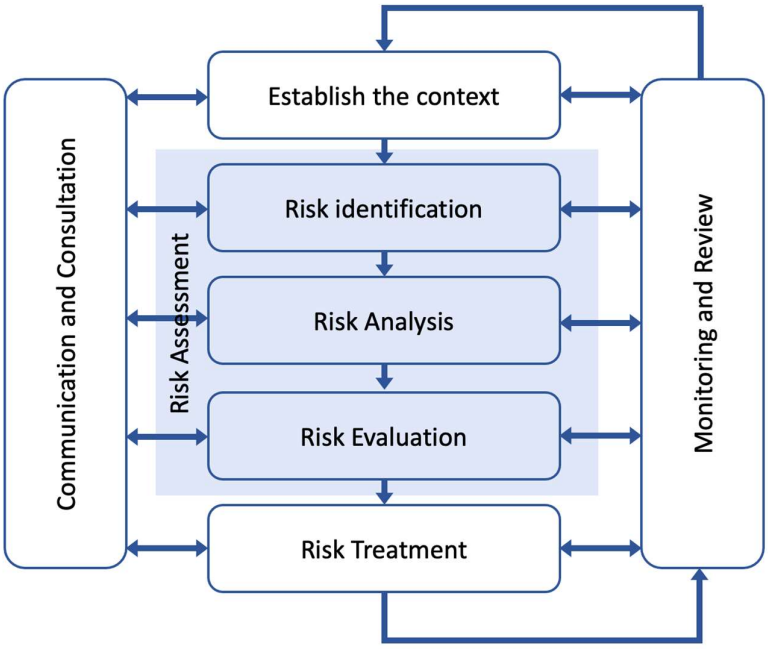

Figure 1. Framework for the ACTRIS risk management process indicating its different steps.

The perimeter of the risk management plan includes all components of ACTRIS as a research infrastructure (RI), including the European-level CFs – Head Office (HO), Data Centre (DC) and six Topical Centres (TC) – and, being a distributed RI, also more than a hundred NFs operated by the the corresponding hosting organisations in the different ACTRIS member and observer countries. The risks focused on in this document are those that concern ACTRIS on the RI level. National-level risks related to the NFs which are not particularly expected to affect the implementation and operations of ACTRIS and its CFs are not included in the risk registry provided in section 4.

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3.2 Contingency measures and principles

Contingency measures are part of the risk management strategy and are preventive actions that allow to readily respond with adequate procedures in case a risk may cause a significant threat or emergency. Contingency measures define i) the contingency plans for selected risks that are identified as being severe and ii) the procedures and decision-making processes in case of arising contingencies. For ACTRIS, contingency plans for high-level risks[1] (HLR) for the implementation phase have been proposed and are summarized in deliverable ACTRIS IMP D2.1 (cf. section 5). The ACTRIS contingency measures are based on the following seven contingency principles:

- **Principle 1**: ACTRIS shall identify the main risks for ACTRIS; this should be done both for implementation and operation phases, separately.
- **Principle 2**: ACTRIS Contingency Plans will be prepared for high-level risks (high/ medium likelihood combined with high/medium impact).
- **Principle 3**: ACTRIS shall define clear procedures and decision-making processes for the contingency situations.
- **Principle 4**: ACTRIS shall follow the contingency plans and procedures each time an identified risk is realised, or an unexpected event causes major deviation in the planned activities and operations.
- **Principle 5**: ACTRIS members, ACTRIS bodies and participating RPOs shall seek solutions for minimising the impact on ACTRIS activities and service provision and supporting the affected Facility/Unit/Country in their contingency and recovery actions.
- **Principle 6**: Affected Facility/Unit/Country shall follow the contingency procedure and inform ACTRIS on the recovery plans by using the template for ACTRIS Contingency Plan.
- **Principle 7**: The HO shall monitor the contingency process and be a centralised repository of ACTRIS Contingency Plans.

The proposed contingency process for HLR is summarized in table 1 below.

Table 1. Contingency process for high-level risks with or without contingency plan.

Contingency process for high-level risks <u>with</u> contingency plan	**Contingency process for high-level risks <u>without</u> contingency plan**
1. The materialised risk shall be communicated to the HO promptly after discovering; the HO's RI Operation Unit (OPU) shall facilitate the contingency processes. 2. The HO shall initiate the contingency procedures, together with the affected Facility/Unit/Country, immediately after the risk/major deviation has been communicated, allowing the prompt start of	1. The materialised risk shall be communicated to the HO promptly after discovering; the HO's RI Operation Unit (OPU) or ERIC Management Unit (EMU) shall facilitate the contingency processes. 2. The HO shall initiate the contingency procedures, together with the affected Facility/Unit/Country, immediately after the risk/major deviation has been communicated, allowing the prompt start of

[1] High-level risks are expected to have a high or medium probability of occurrence combined with a high or medium risk of impact (cf figure 1). They are considered having a potentially severe consequences on the implementation and subsequent operations of ACTRIS.

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Contingency process for high-level risks <u>with</u> contingency plan	Contingency process for high-level risks <u>without</u> contingency plan
recovery actions to minimise any negative effects. 3. The recovery actions shall follow the drafted ACTRIS Contingency Plan. 4. In the case of severe operation failure, the (IAC) GA[2] shall also be informed.	recovery actions to minimise any negative effects. 3. The Facility/Unit/Country affected by the risk shall identify the person and organisation in charge for managing the contingency actions, and for completing the ACTRIS Contingency Plan (template). 4. The (ACTRIS Interim Leader) Director General (DG) shall inform the corresponding ACTRIS bodies, the ACTRIS (Interim) RI Committee[3] and the (IAC) GA about the situation. 5. The ACTRIS (Interim) RI Committee shall discuss and approve the drafted Contingency Plan. 6. The (IAC) GA shall dicuss the Contingency Plan and decide the planned recovery actions. 7. After approval, the recovery actions shall start.

3.3 Responsibilities and roles in the risk management process

The ACTRIS HO has an important role in the risk management process, coordinating the risk assessment and overseeing the risks during ACTRIS implementation and operations. However, all ACTRIS components (HO, DC, TCs, NFs) have their specific roles and responsiblities in the process for analysing, monitoring and reporting on risks and for identifying the specific ACTRIS instances involved in taking specific decisions and actions, particularly during the risk contingency process. All decisions related to major risks are taken by the Interim ACTRIS Council (IAC) / General Assembly (GA)[4], and by the Interim ACTRIS Leader / Director General for risks that are considered minor. An overview of the roles and responsibilities of ACTRIS bodies in the contingency process are given in table 2.

Table 2. Identified roles of different ACTRIS bodies in the risk management process.

ACTRIS Body	Role
(Interim ACTRIS Council) General Assembly	• Approves Risk Management Plan, oversight, and review. • Decides on major risks´ mitigation and contingency actions and decides

[2] The IAC (Interim ACTRIS Council) is the highest decision-making body until the ERIC is created and it is replaced by the GA (ACTRIS ERIC General Assembly).

[3] The Interim RI Committee is an advisory body supporting the Interim ACTRIS Leader and ACTRIS Scientific chair until the ERIC is created and it is replaced by the RI Committee supporting the ACTRIS Directory General (DG).

[4] After the establishment of ACTRIS ERIC (European Research Infrastructure Consortium), the Interim ACTRIS Council (IAC) and Interim ACTRIS Leader will be replaced by the General Assembly (GA) and Director General, respectively.

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ACTRIS Body	Role
	on the resource allocations.
(Interim ACTRIS Leader) Director General	• Drives a culture of risk management and signs the annual risk assessment on RI level. • Executes the Risk Management Plan according to policy and rules decided by GA and applies the necessary measurements and actions. • Decides on minor risk actions related to ACTRIS.
Head Office	• Drafts the Risk Management Plan. • Manages Risk Register at the RI level, ensures relevant communication, collect biennial risk reports. • Oversees mitigation and contingency actions and facilitates the contingency process.
(Interim RI Committee) RI Committee	• Provides the recommendations regarding risk mitigation actions. • Proposes and reviews the risk management activities on RI level.
(Interim Scientific and Implementation Advisory Board) Scientific and Innovation and Ethical Advisory Boards	• Advises and points out risks related to implementation and operation actions to the (IAC) GA and to the (Interim ACTRIS Leader) Director General.
CF Leader	• Provides input to risk assessment on CF level. • Proposes mitigation and contingency actions at the CF level according to the implementation plans and CF agreement, and report risks to the HO. • Leads the implementation of the contingency plan related to the CF-related risks. • Handles the internal communication to CF staff and RPOs.
Hosting RPO of the CF Unit	• Implements CF Unit level risk mitigation according to the decision and agreement(s) of the (IAC) GA. • Ensures staff in their Unit comply with the Risk Management Plan and foster a culture where risks can be identified and quantified.
National Facility Technical and Scientific Forum	• Discusses network-level risks in the NF Technical and Scientific Forum meetings. • Informs potential network or NF level risks to the HO.
National Contact persons and National ACTRIS Consortium	• Keep track of the risk in the NFs and report them to the HO. • Foster a culture where risks can be identified and reported. • Leads the implementation of the contingency plan related to NF-related risks at national level.
Site PIs, staff and Partners in general	• Comply with Risk Management Plan and procedures.

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3.4 ACTRIS risk categories

The risk faced by ACTRIS are grouped into different categories summarizing the potential causes of risks, allowing to better identify, evaluate and respond to the risks.

The following six relevant risk categories within ACTRIS have been defined as follows

I. **RI Implementation and operations**
II. **Service development and provision**
III. **Governance and management**
IV. **Collaboration and communication**
V. **Impact (innovation and socio-economic)**
VI. **Financial and resources**

The risks listed in the ACTRIS risk register (section 4) have been organized according to these risk categories. Risk categories allow to i) determine where risks are most frequent, ii) identify common cases, and iii) better manage and optimize risk responses.

4. Updated ACTRIS risk register

The current risk register is presented in table 3 below. It lists all relevant risks within ACTRIS at mid-term stage of the ACTRIS implementation phase that concern ACTRIS on RI level. The identified risks are grouped by risk category as indicated in section 3.4. The ACTRIS risk registry indicates the probability of occurrence of each risk (ranging from unlikely to likely) and its potential impact, ranging from minimal to significant. The overall severity of a risk is evaluated using a risk exposure matrix by combining (multiplying) the probability and impact of a risk to occur, with the severity of the overall risk ranging from low to high (see figure 2).

Risk rating		Impact		
		Minimal-1	Moderate-2	Significant-3
Likelihood	Unlikely-1	Low	Low	Medium
	Possible-2	Low	Medium	High
	Likely-3	Medium	High	High

Figure 2. Risk exposure matrix applied by ACTRIS to identify the potential seriousness of its risks.

Indicated in the ACTRIS risk register are furthermore the proposed mitigation actions and planned responses. Particularly important are those risks identified as being high-level risks. High-level risks have either a possible or likely probability of occurrence combined with a moderate of significant impact to arise. They are likely to cause a major deviation of the existing work plan, activities, and operations in ACTRIS, should they occur, and require therefore a clear plan of action to recover, in form of a contingency plan (see ACTRIS IMP deliverable D2.1 in section 5 for more information).

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Table 3. ACTRIS risk register (status December 2021). The risks are listed by category, the likelihood and impact of each risk is identified as being high (H), medium (M), or low (L).

Risk #	Risk ID	Description of Risk	Likelihood H / M / L	Potential Impact H / M / L	Mitigation/Risk reduction/Planned response
I. RI implementation and operations					
1	IO1	CFs consortia have difficulties in setting up CF activities for internal support and service provision	M	H	Ensure support from the RPOs and countries hosting CF units to have enough resources for the CF implementation.
2	IO2	The CFs do not have enough capacity to provide the required operational support to NFs	L	M	Establish a well-planned ramp-up process with clear RI support schedule and plan for gathering the capacity as needed. Transfer service capacity (to users) to NF operation support.
3	IO3	Delay in implementing a CF (unit) with respect to initial planning	L	H	Efficient set up of CF governance and collection of formal commitments. Establish solid and realistic implementation plans. Monitor the implementation progress by regular status reports.
4	IO4	Individual CF units do not perform sufficiently	M	M	Clearly define CF unit tasks and responsibilities, regular interactions, and communications via CF management board. Support by HO and GA where needed. Develop contingency plans at CF level and consider redistribution of activities.
5	IO5	Less than half of the foreseen NFs are submitted for labelling process	M	H	Ensure support from the RPOs operating NFs to have enough resources for upgrading and maintaining NFs operative. Ensure that the cost of memberships for ERIC is not hindering the NF.

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Risk #	Risk ID	Description of Risk	Likelihood H / M / L	Potential Impact H / M / L	Mitigation/Risk reduction/Planned response
6	IO6	Delay in labelling processes due to capacity issues at HO, TCs, DC or others	M	H	HO must follow up CF implementation plans, and work in a coordinated manner with the CF leaders in the timelines and procedure to label NFs in different topics.
7	IO7	Inefficient data workflow due to the difficulties in implementation of CFs and NFs	L	H	Ensure the coherent development and implementation of ACTRIS Data Centre according to ACTRIS Data Centre concept and data management plan. Ensure proper RI operation management with all necessary ACTRIS components (HO, DC, TCs and NFs).
8	IO8	The number of NFs to be supported by a CF is lower than expected	M	M	Re-direct the remaining capacity to provision of services to the users.
II. Service development and provision					
9	SP1	The CF does not have enough capacity to provide the required service to users	M	M	Adjust (reduce) the level of service provision and identify additional capacity.
10	SP2	SAMU is not able to provide services to users due to the low level of TC and NF commitments or capacity on the provision of access to external users	L	H	Work together with TC units, NF operators, hosting RPOs and countries to ensure the commitments for service provision. Communicate the benefits for NFs and TCs. Seeking financial support for ensuring capacity of access provision to external users.
11	SP3	The user's interface is not efficient enough to process all the data and service requests from the users	L	H	Establish a long-term plan for the SAMU and DC to be able to increase the capacity and resources if needed.
12	SP4	Users are not aware of the ACTRIS services or the cost per service is too high, resulting in	L	H	Formulate a clear user strategy during the implementation phase in consultation with the experts

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Risk #	Risk ID	Description of Risk	Likelihood H / M / L	Potential Impact H / M / L	Mitigation/Risk reduction/Planned response
		too few requests for access to ACTRIS Facilities via SAMU			and user communities. The awareness with efficient dissemination and promotion activities.
13	SP5	Lack of user uptake for access to ACTRIS services via SAMU	M	M	Strenghten communication with users, increased promotion and publicity. Formulate a clear scientific strategy. Align the service provision to the user needs. Re-direct the service capacity to provision of complementary operation support to NFs.
III. Governance and coordinated management					
14	GM1	Not enough CF-hosting countries as Members or permanent Observers of the ACTRIS ERIC	M	H	Present a clear ACTRIS concept and activity plan to the country delegates and promote ACTRIS with the different stakeholders in the country(ies) concerned and communicate the benefits of ACTRIS for countries. Foresee alternative solutions (e.g., transfer of CF activities to units in other countries) to ensure the high quality and timely management and implementation of activities.
15	GM2	ACTRIS ERIC not established in 2022	L	H	Support the IAC and the countries in the ERIC Step 2 evaluation process
16	GM3	Not enough ERIC-CF cooperation agreements concluded	M	H	Define a clear plan for negotiating and signing the agreements with the RPOs hosting CFs units and NFs.
17	GM4	Not enough CF consortium agreements concluded	L	H	Support from ACTRIS HO in the negotiation process. Re-visit the implementation plan. Continue the basic operations at the contributing institutions.

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18	GM5	Not enough agreements concluded with the NFs	M	H	Communicate the benefits of ACTRIS. Secure enough members for ACTRIS ERIC. Integrate the process with the CFs contract agreement when the RPO have both facilities (contribution to a CF and NF(s)); define a clear plan of negotiation for the rest of the RPOs.
19	GM6	National ACTRIS consortia and national stakeholders are not interactive with ACTRIS ERIC	L	M	Program NF Technical and Scientific Forum and national consortia events with ACTRIS ERIC to keep the communication flow
20	GM7	Underestimation of the expertise and human resources to build ACTRIS	M	H	Guarantee the allocation of necessary human resources and available skills, efficient HR management and realistic progress assessment toward operation, training of staff. Communicate the importance of good HR and management to funders. Have a clear, updated strategy for human resources.
21	GM8	Over-dependence on key individuals	M	M	Ensure the engagement on ACTRIS goals and strategic issues. Communicate with RPOs on their crucial role for providing good work conditions and environment to ACTRIS staff. Create and maintain a supportive and attractive working environment. Monitor the well-being of staff. Adopt a management plan feasible for the complexity of the RI. Train new HR capacity and decrease dependence on single persons. Adopt good documentation and archiving system. Have a clear, updated strategy for human resources.

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22	GM9	Disfunctionalities in the management of a CF	M	H	Increased interaction within CF management board. Support from ACTRIS HO and the RPOs concerned. Transfer of responsibilities to other persons.
23	GM10	Disfunctionalities in the management of a CF unit	L	M	Support from CF, and HO if needed, in the mediation process. Transfer of responsibilities to other persons.
24	GM11	Unsatisfactory level service provision vs operation support (CF favors majority of activities towards NF support)	L	M	Clarify CF engagement, allocating adequate resources for minimum service provision. Discussions at CF management board level.
IV. Collaboration and communication					
25	CC1	Countries do not have strong and well-organized ACTRIS science communities.	L	M	Establish open and well-communicated events for science communities. Support the establishment of National Consortia.
26	CC2	Not enough collaboration agreements concluded with key partnerships (liaisons)	M	L	Participate actively in the international arena, i.e., seeking partnerships and creating concreted means for collaborations and identifying service provision.
27	CC3	Not enough visibility among targeted user groups. ACTRIS does not reach new user communities	L	M	Establish communication tasks working on targeting outreach activities and create different tools and materials to the user groups and stakeholders and facilitate internal and external communications.
28	CC4	The relevance and impact of ACTRIS not sufficiently communicated and promoted	M	M	Update the ACTRIS science case in dialogue with the users. Ensure that users have a proper way to acknowledge ACTRIS by request the users to cite ACTRIS datasets within the text of the publication and include a reference to them in the

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Risk #	Risk ID	Description of Risk	Likelihood H / M / L	Potential Impact H / M / L	Mitigation/Risk reduction/Planned response
					reference list. References to the dataset shall be detail enough that the reader of the paper or document shall be able to obtain the datasets from ACTRIS.
29	CC5	Communication issues between ERIC and CF, between CFs or CF units	L	M	Ensure effective communication channels, regular remote or physical meetings.
V. Impact (innovation and socio-economic)					
30	IM1	Not enough interest from the private sector to co- develop new tools, instruments and/or services with ACTRIS	H	M	Promote ACTRIS platforms for private sector users and improve communication. Participate actively in technology and innovation events. Develop partnerships with private companies in the ACTRIS framework. Identify need for (tailored) services.
31	IM2	ACTRIS does not have enough socio-economic impacts	L	M	Verify and strengthen communication and dissemination strategy and activities. Guarantee the full exploitation of ACTRIS results. Formulate a clear scientific strategy and align it to the needs of the user communities. Ensure the needed resources and competence for promoting, analyzing and communicating impacts.
32	IM3	Impact from TC on science and technology is not visible enough	L	H	Additional efforts to increase participation in scientific conferences and expert working groups. Foster technical publications.
VI. Financial and ressources					
33	FR1	Insufficient resources for building the necessary infrastructure	L	H	Adjusting the implementation plan, redistribute the work between the CF units.

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Risk #	Risk ID	Description of Risk	Likelihood H / M / L	Potential Impact H / M / L	Mitigation/Risk reduction/Planned response
34	FR2	Underestimation of real implementation costs	M	H	Update and revise the financial plan regularly. Revise the cost assessment, some of the services may not be implemented due to cost. Analyze expenditures actively seek for cost efficiency in, e.g., procurements and operations RI-wide and with other environmental RIs.
35	FR3	Underestimation of real operation costs	L	H	Update and revise the operational costs regularly. Identify additional funding sources.
36	FR4	Limited or insufficient financial support from some CF-hosting countries	M	H	Re-distribute the work between CF Units. Optimise the RPOs support and resources.
37	FR5	CF Units do not get as much funding as needed from the national funding sources for supporting the operations and service provision.	M	H	Adjusting the implementation plan. Unit redundancy for some of the key variables. Focus on crucial activities. Downscaling in operation support frequency and service provision.
38	FR6	Difficulty securing long-term national funding (depending on political decisions)	M	H	Ensure and communicate the ACTRIS goals and scientific strategy, promote the scientific needs covered by the CF.
39	FR7	CF Units lack suitable staff for providing expected operation support and services (difficulty of recruiting skilled personnel, long-lasting absence, …)	L	H	Have a good HR strategy, implement efficient human resources management and training of staff at the host institutions. Specialized training programs and staff exchanges.
40	FR8	Demotivation of CF staff in non-scientific or non-technical tasks	L	M	Adjust HR profile to expected (e.g., administrative) tasks, sharing the CF workload between CF staff, maintain attractive activities, providing satisfying work conditions and working environment to CF staff.

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41	FR9	Substantial loss of key instrumentation (e.g., major breakdown)	M	M	Ensure redundancy of key instruments and optimized relationship with instrument manufacturers including preventive and corrective maintenance agreements
42	FR10	Difficulties in engaging new countries	M	H	Engage key countries and funders early in the negotiations. Keep everyone informed. Prepare (the decisive) meetings well with realistic financial plans. Build up trust and transparency in the working culture. National ACTRIS Consortia play an important role at the national level
43	FR11	Lockdown of personnel due to sanitary or to other crisis	M	H	Prepare a continuity plan ready for the phases of lockdown, implement online tools and training for communication and virtual interactions. Prioritise activities that are feasible via remote activities.
44	FR12	Economic downturn, recession	M	H	Analyse expenditures and actively seek for cost efficiency. Find ways to pool research and network resources at all levels. Adapt the activities and budget to the current economic situation by focusing on crucial activities and/or adjusting to provision of services and support to new scientific needs emerging from new difficulties and challenges.

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5. References

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