

EPOS SP – Grant Agreement n. 871121

D4.3 - Mechanisms and procedures for integration of new thematic communities and for wider TNA

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Executive Summary

This deliverable (D4.3) is written within the framework of the European Plate Observing System – Sustainability Phase (EPOS-SP) Project, funded by the European Commission (EC) H2020-INFRADEV-2019-2 program with the Grant Agreement no. 871121, under the Work Package 4 (Increasing Value for Users), Task 4.2 Integrating new communities in the EPOS Delivery Framework. The main objective of this task is to provide initial plan that can be used in the EPOS-ERIC Implementing Rules Section 2, regarding the new thematic communities. In addition, procedures related the transnational access (TNA) to various facilities in EPOS is addressed by providing a framework for the integration of TNA activities in the EPOS delivery framework.

Integration of new thematic communities is an essential part of the future developments envisaged in EPOS. The process of integration is considered in two steps. First step involves in engaging the interested thematic communities through a mechanism, where the relevant communities are prepared in the integration process seen from scientific, technical, governance, legal, and financial dimensions. During this preparatory phase, the new communities are given the status of “candidate TCS”. Application to the status of a full Thematic Core Service (TCS) in EPOS is then evaluated by the EPOS-ERIC General Assembly (GA), based on a rigorous validation process considering the scientific, technical, governance, legal, and financial dimensions. Each step in this process is explained in some detail and draft implementing rules for the candidate TCS status is suggested. In this process the Tsunami Research Community, that has already approached EPOS-ERIC formally to start the integration to become a TCS in EPOS, is used as a pilot in defining the requirements and criteria for obtaining the candidate TCS status. From the technical perspective, the integration process is already well identified through the ICS-TCS interactions, currently organized through four dedicated workshops each year, followed by four development cycles, where the integration of new services and functionalities are planned and executed. In addition, during the “Pilot Operation Phase (POP)” of EPOS (2020-2022), a comprehensive testing of the services is conducted referred here as the “Pilot Operational Testing (POT)”. During the first time-window of POT, all services integrated or accessible in EPOS Integrated Core Services – central hub (ICS-C), are tested through a detailed set of technical tests, as well as dedicated user tests involving various user groups. Experiences gained and the procedures developed in the first POT window are recommended to be adopted for the implementing rules – section 2, regarding the integration of new thematic communities and their services.

TNA services in EPOS are defined in a separate section, and the plans for integration in EPOS through a TNA brokering service is explained. Here, facility access providers are shown with the underlying details, together with the relevant TNA calls and procedures for application, where users can choose and apply. In addition, a governance and coordination structure for TNA is proposed. The procedure of application to TNA services, in the case the access is coordinated by a facility access coordinator in a relevant TCS and financial support is provided by EPOS-ERIC, are given in detail.

1. Introduction

This deliverable (D4.3) is written within the framework of the European Plate Observing System – Sustainability Phase (EPOS-SP) Project, funded by the European Commission (EC) H2020-INFRADEV-2019-2 program with the Grant Agreement no. 871121, under the Work Package 4 (Increasing Value for Users), Task 4.2 Integrating new communities in the EPOS Delivery Framework.

The main objective of Task 4.2 is to develop mechanisms and procedures for future integration of new thematic communities in the EPOS Delivery Framework. In order to reach this goal, two thematic communities representing tsunami modelling research and the earthquake engineering are used as pilots for identifying and evaluating, as well as creating a clear roadmap for integration of their services. The third pilot focuses on enhancement of the functionalities of the transnational access (TNA) module developed earlier, with the aim of providing tools for sustaining TNA services to a variety of thematic communities.

According to the EPOS ERIC Strategic Plan 2020-2022, one of the challenges for consolidating the sustainability of the EPOS Delivery Framework is to increase the number of scientists that provide and use the EPOS services. Establishing new Thematic Core Services is an efficient tool to accomplish this goal.

In this deliverable (D4.3), following a short background on the role of thematic communities and their services in the larger EPOS architecture, process of TCS establishment and formal validation is described with reference to the process adopted during the EPOS Implementation Phase (EPOS-IP) to the current TCSs. The main focus of the deliverable is to provide procedures for establishment of new TCS.

2. Background

EPOS functional architecture (Figure 2.1) consists of three main elements, **national research infrastructures (NRI)**, **the thematic core services (TCS)** and the **integrated core services (ICS-C)**. Data are collected, archived and curated at NRIs. Thematic communities provide community specific services (i.e. Thematic Core Services – TCS) giving access to data and data products developed based on the data provided by the NRIs. The Integrated Core Services (ICS) is built upon the integrated services provided by the thematic communities and provide open access to interoperable **data, data products, software and services (DDSS)**, through its EPOS portal (i.e. ICS Central Hub - ICS-C).

There are currently 10 thematic communities integrated in EPOS. These are:

- Seismology (SEIS)
- Near Fault Observations (NFO)
- GNSS Data and Products (GNSS)
- Volcano Observations (VOLC)
- Satellite Data (SATD)
- Geomagnetic Observations (GEOMAG)
- Anthropogenic Hazards (AH)
- Geological Information and Modelling (GIM)
- Multiscale Laboratories (MSL)
- Geo Energy Test Beds (GETB)

Among these, all nine TCSs are formally validated during the Implementation Phase of EPOS, except the GETB community, which is now considered to be embedded in TCS Multiscale Laboratories (TCS-MSL).

EPOS Functional Architecture

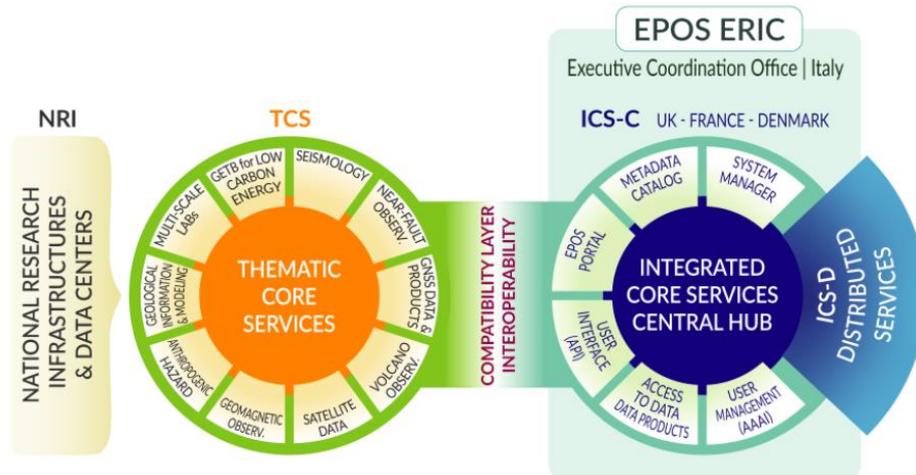


Figure 2.1. EPOS functional architecture consists of three main elements, the national research infrastructures (NRI), the thematic core services (TCS), and the integrated core services (ICS).

Process of TCS establishment and formal validation during the Implementation Phase is described below in Section 3. In addition, there are now several thematic communities that are interested in becoming a TCS in EPOS, such as the tsunami modelling research community, the earthquake engineering community and the exploration geophysics community. Among these the Tsunami Research community has approached EPOS-ERIC formally and their possible integration is currently being discussed.

3. Process of TCS establishment and formal validation

In this chapter, the process of TCS establishment and formal validation for the already existing TCSs are explained, and in addition, formal procedures of EPOS-ERIC, are described in the following sections. In section 3.1, the process of establishment and formal validation as adopted during the EPOS-IP Project is described. During the period where EPOS-IP was active (2016-2019), the executive coordination office of EPOS was created with the formal establishment of the EPOS-ERIC (EPOS – European Research Infrastructure Consortium) in November 2018, in Rome, Italy. Establishment of formal procedures in EPOS is then explained in a separate section below (see Section 3.2).

The process of TCS establishment involves technical implementation of TCS services in ICS, establishment of an appropriate governance structure with legal agreements, as well as a financial description of the TCS services. As such, the integration of a thematic community in EPOS requires the four typical dimensions to be considered, the technical, governance, legal and financial. In addition, the scientific dimension is considered separately with respect to the existing EPOS Delivery Framework and in line with the general strategy of EPOS.

3.1 Procedure adopted in EPOS Implementation Phase for accepting the current TCS communities

During the EPOS Implementation Phase (EPOS-IP) project, 10 thematic communities were included as part of the implementation plan for the EPOS delivery framework. These 10 TCSs are listed in chapter 2 above. Implementation of these TCSs were conducted considering the four dimensions, technical, governance, legal and financial.

Technical dimension has involved identifying the individual services provided by each TCS with respect to their maturity. Each TCS has conducted a verification procedure (self-assessment) based on their priorities and the maturity of the services and, have selected a list of services to be implemented in ICS-C. Integration of individual DDSS from each TCS service category, was done adopting a harmonized metadata structure based on CERIF (Common European Research Infrastructure Format), in line with the developments and implementation of the ICS central hub (ICS-C) platform. The entire process of “technical readiness assessment” was done first by internal verification of the thematic communities by a self-assessment followed by an external validation of the services after their integration to ICS-C, through user feedback groups that were established for each thematic community. Details of the technical integration process can be found in the respective deliverables of the EPOS-IP Project (EC H2020-INFRADEV-2014/2015 Grant Agreement No. 676564).

The governance dimension involved preparing the thematic communities for the construction of a harmonized governance by the establishment of TCS consortia. In this harmonized governance structure, each TCS consortium is composed of service provider organizations responsible for the delivery of integrated services and is chaired by one of the participating organizations. Coordination is usually done by a dedicated board with selected representatives and chaired by one of the participating organizations. The legal dimension involved in signing TCS consortium agreements and the underlying data provision through the letters of intent provided by the data provider organizations. Each TCS consortium may also include several ad-hoc bodies that usually have advisory functions, such as scientific advisory board, user feedback group etc. However, it should be noted that some thematic communities have followed different governance structures respecting their historical community developments. Later, after the establishment of the EPOS-ERIC formally, now each thematic community signs a dedicated multiyear collaboration agreement with EPOS-ERIC on TCS coordination and outreach, that regulates the TCS through legal agreements.

Financial dimension of TCSs involved declaring the costs of TCS services in the three defined service cost categories, TCS coordination and outreach, virtual access, and transnational access. A cost-book is compiled consisting of the detailed information on the cost of each TCS virtual service with the underlying DDSS elements according to the harmonized cost descriptions.

After a comprehensive technical readiness assessment as well as a validation process by the Board of Governmental Representatives (BGR) including the governance, legal and financial aspects, nine out of 10 TCSs were validated to become a formal TCS in EPOS delivery framework (see the list of TCS mentioned in chapter 2).

3.2 Establishment of formal procedures in EPOS-ERIC

Formal governance structure of EPOS-ERIC is shown in Figure 3.1 below. In this structure, the General Assembly is the supreme decision body, whereas the execution is conducted by the Executive Director with the support of the Executive Committee (EC), Executive Coordination Office (including officers, units and services), Service Coordination Committee (SCC) and the External Boards (Scientific Board and the Ethics Board). EPOS-ERIC is governed according to its statutes and the Implementing Rules. The statutes of EPOS-ERIC are available in the EPOS-ERIC webpages. Implementing Rules refers to the details of the regulations needed for the execution of the EPOS-ERIC as a research infrastructure. Thematic Core Services (TCS) are responsible for the operation of their services and, are outside the EPOS-ERIC Governance. However, TCSs are linked to the EPOS-ERIC through a series of individual multi-year collaboration agreements (MYCA). National research infrastructures (NRI) are outside the EPOS delivery framework as shown in Figure 3.1. Different functions of these bodies are indicated with the corresponding colour code and shown at the bottom of the Figure 3.1.

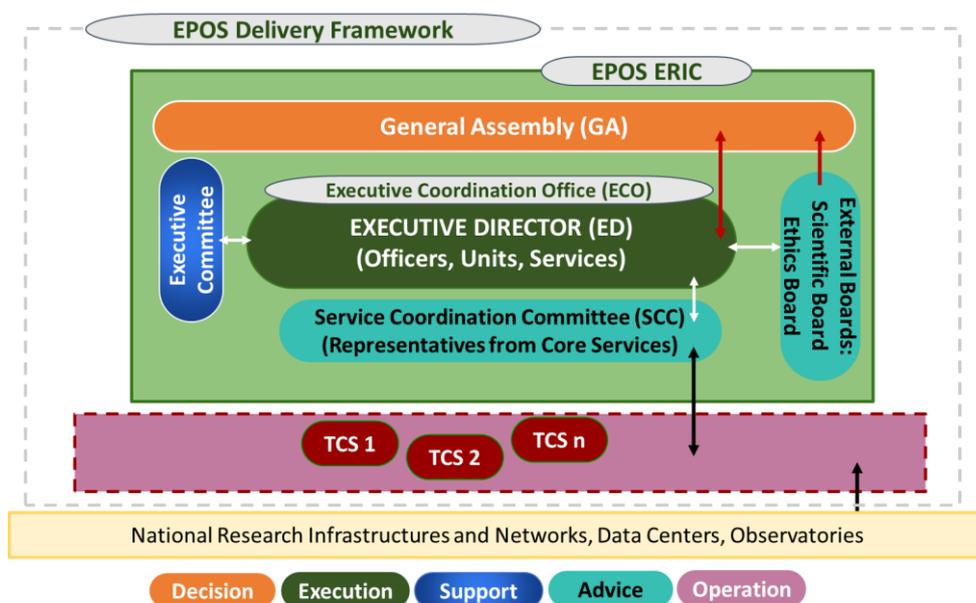


Figure 3.1. EPOS-ERIC organizational structure.

EPOS-ERIC Executive Coordination Office (ECO) as shown in Figure 3.2, is led by the Executive Director, supported by the EPOS-ERIC Officers (Scientific Officer, Capacity Building Officer and the IT-Officer), various units (Administration Unit, Management and Operation Unit, Communication Unit, and IT Unit). In addition, legal services are provided externally by a professional agency.

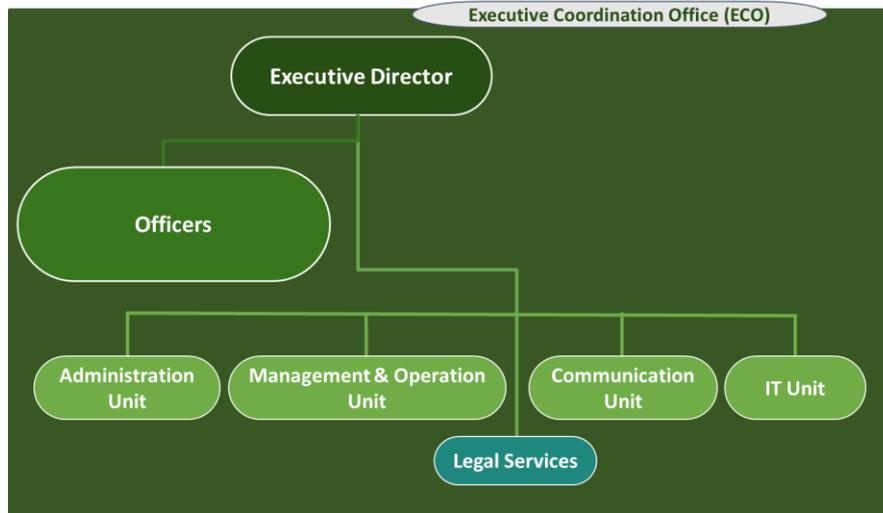


Figure 3.2. EPOS-ERIC Executive Coordination Office structure.

In addition to the ECO, SCC and the Advisory Boards, there is established an IT-Board and ICS-C Hosting and Operation Unit, to coordinate the IT-developments, TCS-ICS Interactions, external relations, and operation of the ICS-C (Figure 3.3). TCS-ICS Interactions, and hosting and operation of the ICS-C, are regulated by separate multi-year collaboration agreements (MYCA).

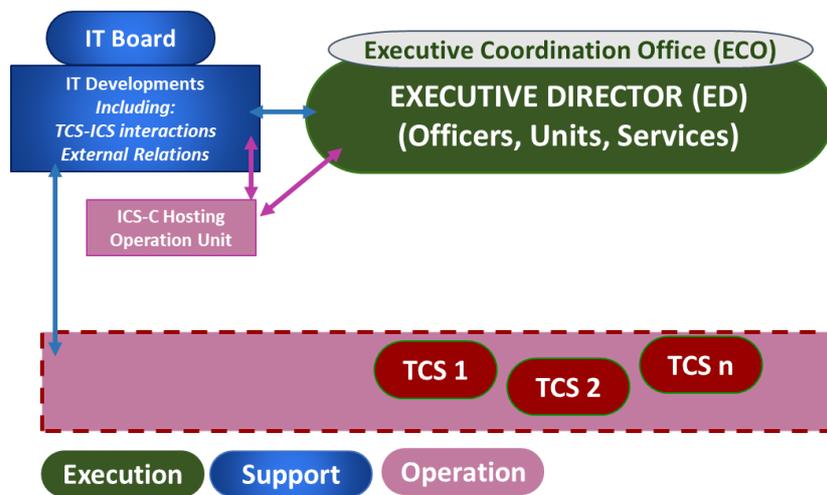


Figure 3.3. EPOS-ERIC Executive Coordination Office (ECO) IT-Board, ICS-C Hosting and Operation Unit and the individual Thematic Core Services (TCS). Different functions of these individual bodies are indicated by the coloured boxes below.

Based on the EPOS-ERIC governance structure as explained above, formal procedures are now established as a part of the regular operations of EPOS-ERIC as a research infrastructure. As such, procedures for establishment of new TCS are part of the formal operations of the EPOS-ERIC and will be regulated through the Implementing Rules – Section 2. In the following section, preliminary ideas with regard to the establishment of new TCS are given, in order to help the process of finalizing the Implementing Rules – Section 2.

4. Procedures for establishment of new TCS

Procedures for establishment of new thematic communities (Thematic Core Services – TCS) will be regulated by the Implementing Rules- Section 2 of the EPOS-ERIC. Currently these implementing Rules are being discussed by the relevant bodies of EPOS-ERIC and will be finalized most likely during the Pilot Operational Phase (POP) of EPOS (until the end of 2022). In the following section, initial ideas about the procedures for establishment of TCS are presented, with the main purpose of preparing a preliminary version that can be used for discussions during the preparations of the Implementing Rules – Section 2. In the following, the current status of the Implementing Rules – Section 2 preparations are given:

- During the **Implementation Phase** the EPOS Community discussed and agreed on **“principles”** for establishing new TCS.
- These **“principles”** need to be transformed into **“rules”** and be included in the Section 2 of the EPOS ERIC Implementing Rules.
- There are **several thematic communities interested in becoming an EPOS TCS**
These are the Tsunami Research, Earthquake Engineering, and Exploration Geophysics communities.
- One of these communities, **the Tsunami Research Community, has already** approached EPOS to formally initiate the process of integration.
- A **procedure for “Candidate” TCS is introduced and endorsed by the EPOS-ERIC General Assembly** which will help the interested communities to start working towards fulfilling the technical, governance, legal and financial requirements for being validated as a full TCS in the future (according to the Implementing rules adopted by the General Assembly).
- The fact that the **Tsunami Community has already** approached EPOS ERIC to formally initiate the process of integration provides an opportunity to use it as a test case and it will allow the concerned bodies to work on the Implementing Rules in a constructive way.

The recommended process to become a Thematic Core Services can be summarized as follows:

- Apply for the status of Candidate TCS:
 - The organization acknowledged as a key player, representing the Candidate TCS, presents the candidature to the EPOS ERIC Executive Director
 - The EPOS ERIC Executive Director advised by the Service Coordination Committee and after consultation of the External Scientific Board decides whether the status of the Candidate TCS can be granted
- Pass through the status of Candidate TCS having fulfilled the validation:
 - The duration of the Candidate TCS status is up to 3 years or until the validation process (governance, technical and financial) has been fulfilled upon endorsement of the Service Coordination Committee and decision of the Executive Director.
- Apply to become a full TCS according to the procedure reported in the Implementing Rules:
 - The community will be endorsed of the status of EPOS Thematic Core Services ONLY after the completion of the concerned procedure.
- **The status of TCS is granted by the EPOS ERIC General Assembly upon consideration based on an evaluation of the application of the new thematic community to become a full TCS.**

In the following, description of the Candidate TCS status, and validation of a TCS are given in two separate sections (see Sections 4.1 and 4.2 below). In addition, simplified guidelines are provided in Section 4.3.

4.1 Candidate TCS

The status of Candidate TCS is introduced in order to provide a collaborative framework as well as a work programme to prepare a new thematic community to become a TCS and to be integrated into the EPOS Delivery Framework. At least three (3) scientific research organisations can form a proposal to become a Candidate TCS.

4.1.1 Criteria to become a Candidate Thematic Core Services

To become a Candidate TCS, the applicants to the Candidate TCS status (the aforementioned scientific research organisations) must fulfil the criteria below:

- they belong to a thematic community that is not already represented in EPOS,
- they plan to offer pan-European services that do not already exist/are not in competition with existing EPOS services; a list of the services must be provided,
- they designate one organisation, acknowledged as a key player, representing the Candidate TCS,
- they identify the organisation that will be in charge of the Candidate TCS Governance and Coordination during the candidature phase,
- they identify technical, scientific and administrative (legal, governance, financial) contact persons,
- they present a concrete plan to integrate all key players of its community in the future,
- they commit to integrate the TCS services seen from technical, legal, governance and financial points of view,
- they commit to integrate users and data providers in their future governance model,
- they acknowledge EPOS Data Policy and commit to respect it (and by doing so, to foster open access to its DDSS).

4.1.2 Process to become a Candidate Thematic Core Services

Process to become a Candidate TCS is as follows:

- the organization acknowledged as a key player, representing the Candidate TCS, present the candidature to the EPOS ERIC Executive Director,
- the EPOS ERIC Executive Director advised by the Service Coordination Committee and after consultation of the External Scientific Board decides whether the status of the Candidate TCS can be granted,
- the duration of the Candidate TCS status is up to 3 years or until the validation process (governance, technical and financial) has been fulfilled upon endorsement of the Service Coordination Committee and decision of the Executive Director; the Candidate TCS status may be extended up to one year under special circumstances provided that there is a clear roadmap for applying full TCS status,
- after completion of Candidate TCS status, the TCS can apply to become a TCS (see concerned section in this Implementing Rules).

4.1.2.1 Documentation for the candidature

The candidature shall consist of the following documents:

- a summary document that should contain specific explanations concerning each criterion mentioned in section 1.1,
- a list of countries currently involved in the service provision,
- a list of pan-European services they plan to offer that do not already exist/are not in competition with existing EPOS services,
- governance structure model and technical, scientific and administrative (legal, governance, financial) contact,
- a plan to integrate all key players of its community in the future.

4.1.3 Candidate Thematic Core Services rights and obligations during their Candidate Status

The Candidate TCS shall

- be granted with the Observer Status in the Service Coordination Committee,
- have access to the EPOS Intranet with a dedicated repository area,
- have access to the IT repositories in order to gradually achieve the required technical harmonization and integration,
- cooperate with the EPOS ERIC Communication Unit for coordinating communication and dissemination plan in line with the EPOS Communication Plan,
- provide an estimate of the costs for operating the services (TCS Cost-book);
- identify the organisation that will be in charge of the Candidate TCS Governance and Coordination,
- participate to the ICS-TCS workshops for interacting with EPOS IT Board,
- provide a yearly report on the status of validation process (governance, technical and financial) to the Executive Director.

4.2 Validated TCS

This section highlights the general requirements and procedures for becoming a new Thematic Core Service (TCS) in EPOS, that can be considered in the formal TCS validation process. Integration of new thematic communities as a new Thematic Core Service (TCS) in the EPOS delivery framework requires a structured approach. Here, it is important to distinguish between the integration of a new TCS representing an entire thematic community on one hand, and the integration of individual services from a given TCS on the other. In the following we focus on the integration process of a new TCS.

Process of integration of new thematic communities, which have been already accomplished the “Candidate” status, in EPOS involves the following:

- 1) **Technical Readiness Assessment (TRA)** of the TCS-services (requires internal verification + external validation)
 - a) Requires verification of the services in TCS domain specific portal(s) internally by a dedicated group from TCS itself.
 - b) Requires verification of the technical integration by testing the services in concern within the EPOS-ICS by a dedicated group composed of both TCS and ICS.
 - c) Requires a written documentation for the above two points in the form of a report (TRA-report).
 - d) Requires extensive testing and external validation of the technical readiness of the TCS services.
- 2) **TCS Governance Readiness** (requires external validation)

- a) Requires that the TCS has established a formal TCS-Consortium with appropriate representation from the underlying data provider community.
 - b) Requires that the TCS-Consortium has a formal governing body (e.g. TCS-Board), with details of implementing rules defined.
 - c) Requires that the TCS have selected the leading institution and the chairperson for the TCS-Governing Board.
- 3) **TCS Legal Readiness** (requires external validation)
- a) Requires that the TCS Consortium Agreement is signed by the TCS Consortium members.
 - b) Requires legal documents making sure that the data provider institutions give their consent for redistribution of their data through both domain specific portals and later in EPOS-ICS.
- 4) **TCS Financial Readiness** (requires external validation)
- a) Requires that the financial aspects of the TCS services in concern are defined clearly in the cost-book of EPOS services, including both in-kind contributions as well as expected dependency from other financial resources.

In the EPOS-ERIC construction, requests for integration of new TCS is first handled by the “**Service Coordination Committee (SCC)**”, which is established as part of the formal structure of EPOS-ERIC. SCC is a coordination body with representatives from all core services in EPOS (i.e. TCSs and ICS). SCC makes sure that for each new TCS integration process, four steps mentioned above are carried out and the scientific added value is considered. If needed, SCC uses expert groups for external validation processes described above. It is then **EPOS-ERIC General Assembly (GA)**, that finally **approves** the integration of a new TCS and **adopts** the implementation of their services, following the formal procedures established for verification and validation, seen from the technical, governance, legal and financial perspectives.

Once a new thematic community is adopted as a “Candidate-TCS”, the process of integration of underlying services to EPOS Integrated Core Services (EPOS-ICS) involves the following:

- 1) Ideally each TCS should have their services available and accessible (**following open access and FAIR principles**) in their domain specific portal(s).
- 2) These available services from TCS, should then follow the defined protocols for metadata integration (**EPOS-DCAT-AP**) and should give access through **web-services** where the data provided can be searched and accessed using specific query parameters, and further can be displayed in a desired way.

After the above steps are done then the TCS services need to be **verified internally and validated externally**. The final approval process is conducted by the General Assembly of the EPOS-ERIC.

4.3 Guidelines for establishment of new TCS

Following is a short guideline that summarize the relevance of the required criteria for the process of integration of a new TCS (see Annex-1 for a more complete version). Criteria numbers below refer to the criteria shown in Section 4.2 above.

- **Regarding Technical Readiness:**
 - **Criteria 1a:**
 - Identify and select relevant TCS specific data portals for inclusion in EPOS.

- Requires **internal verification**.
 - Requires documentation.
 - **Criteria 1b:**
 - Identify individual DDSS elements from the concerned thematic community that are ready to be integrated to EPOS.
 - Prepare for integration including timeline, resources, and well-identified responsibilities among participating institutions.
 - Execute the integration of selected (prioritized) DDSS elements together with ICS experts.
 - **Internally verify** the technical readiness of the implemented (integrated) services.
 - **Criteria 1c:**
 - **Report** on the outcome of the technical readiness assessment.
 - **Criteria 1d:**
 - Establish user feedback groups (UFG) for **external validation** of DDSS elements that are integrated to EPOS through the ICS.
 - Execute **extensive testing** of the relevant TCS services following the Pilot Operational Testing (POT) procedures, including both technical testing of services and user testing.
- **Regarding Governance Readiness:**
 - **Criteria 2a:**
 - Identify the members of the TCS Consortium.
 - Establish appropriate representation with data provider communities included.
 - Establish the formal TCS Consortium (to be formally established by a legal agreement – see Criteria 3a below).
 - **Criteria 2b:**
 - Establish the TCS Board as the governing body of the TCS Consortium.
 - **Criteria 2c:**
 - Identify the leading institution for the TCS Consortium.
- **Regarding Legal Readiness:**
 - **Criteria 3a:**
 - TCS Consortium Agreement is signed by legal entities constituting the Consortium.
 - **Criteria 3b:**
 - Collect formal consent letters from the data providing community allowing redistribution of data provision in EPOS.
- **Regarding Financial Readiness:**
 - **Criteria 4a:**
 - Identification of cost-categories for different services
 - TCS Governance and Coordination service,
 - TCS Virtual Access (VA) services,

- TCS Transnational Access (TA) services.
- Completing the cost-book of EPOS with relevant information including
 - In-kind resources,
 - In-kind contributions,
 - Cost of the individual services,
 - Dependency on EPOS-ERIC funding.

5. Procedures for establishment of TNA

In order to coordinate and harmonize the Transnational Access (TNA) procedures in EPOS, a dedicated TNA working group (TNA-WG) was established, with participation from the relevant TCSs and is lead by a representative from the TCS on Multiscale Laboratories (TCS-MSL). At the EPOS-SP kick-off meeting (February 2020) Utrecht University received mandate to organize a TNA working group, focusing on setting out the requirements for validation of Facility Access. The working group consists of representatives of all TCS that have provided TNA in the past or wish to do so in the future (TCSs MSL, VOLC, NFO, SEIS, and candidate TCSs GETB and Tsunami).

A specific “Facility Access Validation” document is prepared by the TNA Working Group and contains the rules to which each TCS must conform to validate their Facility Access service as an EPOS service (see Annex-2). This document is part of the EPOS 2021-2023 Service Activation Roadmap and covers the technical, governance, legal and financial dimensions.

This document is part of the EPOS 2021-2023 Service Activation Roadmap. The Service Activation Roadmap specifies that the Multi-Year Collaboration Agreements with TCS for Facility Access Coordination and Provision will cover the activation of Facility Access coordination and provision, assessing the legal and governance frameworks for operating Facility Access calls, clarifying the financial dimension for approving the eligibility, and making the Facility Access service fully operational. A Multi-Year Collaboration Agreement will be signed by EPOS ERIC and the Facility Access Coordinator to create the collaborative framework to monitor its operation and to discuss the financial eligibility of the Facility Access provision.

5.1 Definition of TNA in EPOS

Transnational access (TNA) in EPOS is defined as one of the three main service categories, TCS Coordination and Governance, Virtual Access (VA) and TNA. TNA is provided through Facility Access coordinated by individual Facility access Coordinators at the relevant TCSs and are provided by several facility access providers, that provide physical or remote access to the relevant facilities and services.

In the context of EPOS Facility Access, following types and modes are identified:

- There are three types of Facility Access: Physical, Remote, and Virtual.
 - **Physical Access:** Involves hands-on access of Users (i.e. a physical visit to the Facility) – access to limited resources for which competitive selection is needed.

- **Remote Access:** User does not visit the Facility physically – access to limited resources for which competitive selection is needed.
 - **Virtual Access:** User does not visit the Facility physically – access to unlimited resources for which competitive selection is not needed.
- There are three modes for Facility Access: Excellence-driven, Market-driven and Wide.
- **Excellence-driven Access:** this is exclusively dependent on the scientific excellence, originality, quality and technical and ethical feasibility of an application evaluated through peer review conducted by internal or external experts. This Access mode enables collaborative research and technological development efforts across geographical and disciplinary boundaries.
 - **Market-driven Access:** this applies when Access is defined through an agreement between the User and the Facility that will lead to a fee for the Access and that may remain confidential.
 - **Wide Access:** this involves the broadest possible Access to scientific data and digital services provided by the Facility to Users.

For validation of Facility Access as an EPOS service, only access to limited resources is considered, i.e. Physical and Remote Access, based on the Excellence-driven Access mode. Market-driven and Wide Access will not be part of the EPOS Facility Access service but may be facilitated through the ICS-C facility access brokering system. Facility Access covers legitimate and authorized physical and remote admission to, interactions with, and use of, facility services offered by Facilities to Users.

In the validation document the four dimensions of EPOS (Technical, Legal, Governance and Financial) in relation to the validation of TNA are set out. This includes the relations between EPOS ERIC and the TCS Stakeholders (TCS Consortium Board, Facility Access Coordinator, Facility Access Providers, Facility Access Users; Figure 5.1), and the necessary legal agreements between them.

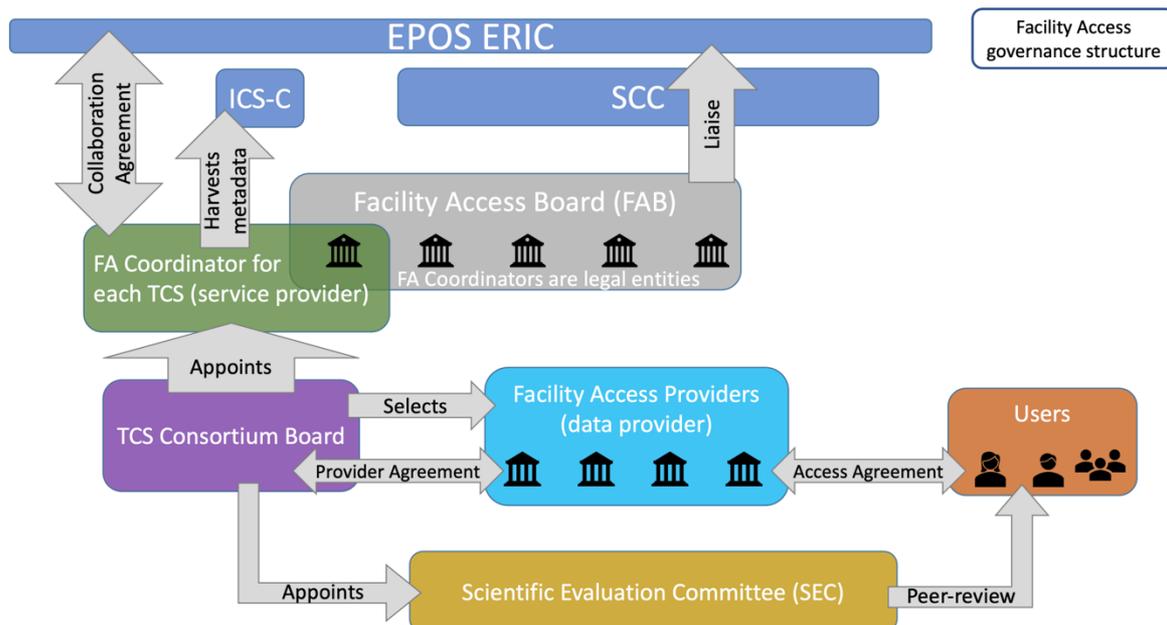


Figure 5.1. Governance structure for Facility Access.

For the Financial dimension of the Facility Access Validation Document a reimbursement schema between EPOS ERIC and the TCS Stakeholders is proposed in Figure 5.2. Each TCS appoints a FA coordinator, who signs an agreement with EPOS ERIC and sets out the Facility Access finances in the TCS Cost-book.

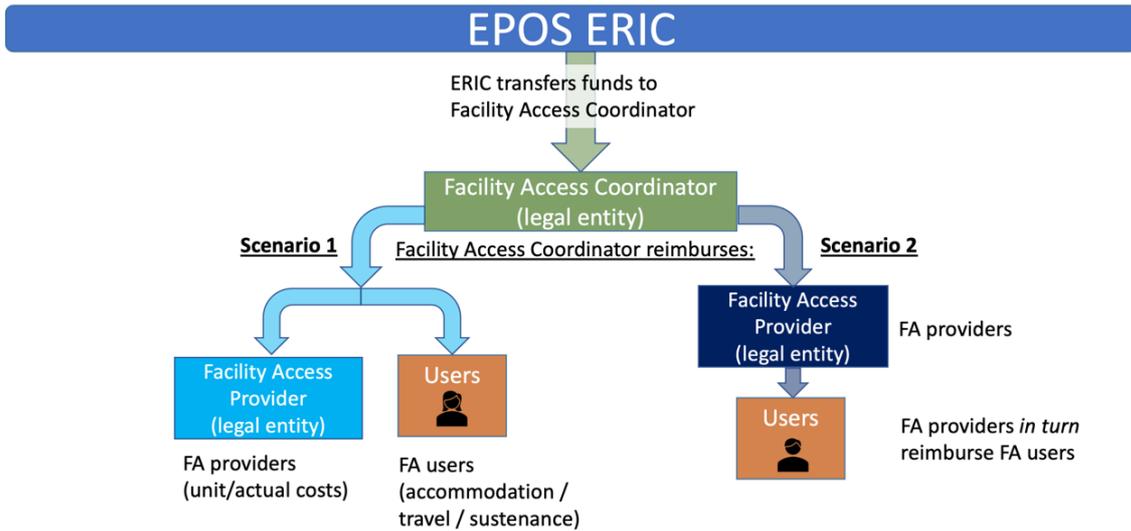


Figure 5.2. Proposed reimbursement schema for Facility Access.

Each Facility Access providing TCS is responsible for the technical implementation, as set out in the validation document. The access procedure for each TCS must include the elements specified in the validation document and set out in Figure 5.3.

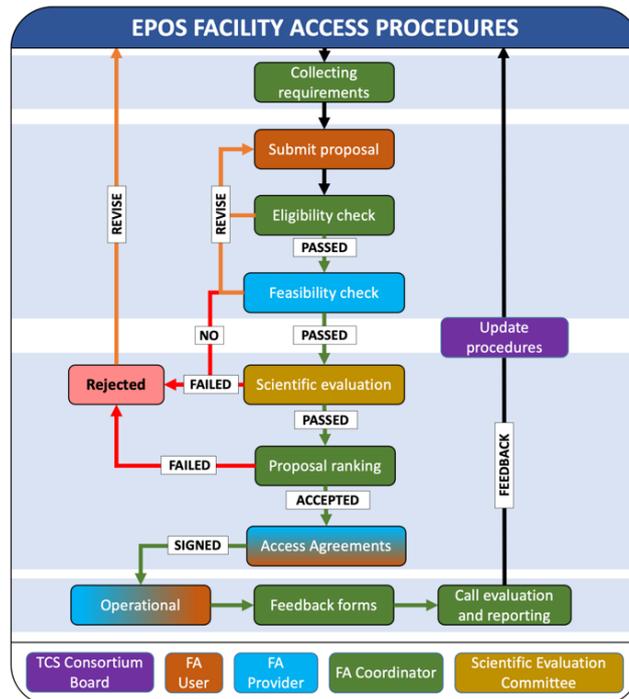


Figure 5.3. Access procedures for EPOS Facility Access.

5.2 Validation of facility access as an EPOS service

Draft procedures for validation of facility access are outlined in a dedicated document prepared by TNA Working Group (WG) (see Annex-2) and, will be processed at EPOS-ERIC ECO and as well as SCC. This will then be used as an input for the Implementing Rules section 2 of EPOS-ERIC to be later discussed and processed by the General Assembly for final approval.

6. Concluding Remarks

EPOS Strategy document describes the three-year period between 2020-2022, as the Pilot Operational Phase (POP), in EPOS. During the POP, a specific testing procedure “Pilot Operational Testing - POT” is adopted. The details of this can be found in separate EPOS-ERIC reports. The technical dimension of the proposed validation process should take into account the procedures applied in the POT to be consistently executed for each thematic community service. These procedures are intended to be repeated in regular intervals for all services in order to check their sustainability over time. Successful execution of the POT procedures during the first window of POT in 2020-2021, provides a well-structured approach to technical testing of the TCS services both at their initial integration and entry to the ICS-C system, as well as during the operational phase with regular intervals to ensure the long-term sustainability of the services within the EPOS delivery framework.

Governance, legal and financial dimensions are regulated by respective collaboration agreements and service agreements which are intended to be a pre-defined multi-year duration and to be revisited and if necessary revised at the end of each such period. As such the long-term sustainability of the governance, legal and financial aspects are also ensured through this repetitive process of renewal of the collaboration agreements and service agreements.

Annex 1 – Guidelines for integration of new thematic communities

Annex 2 – Validation of Facility Access

EPOS-SP Project

WP4 – Task4.2

Guidelines for Integration of New Thematic Communities

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Executive summary

This report is written as an internal document to be used within WP4, Task4.2 of the EPOS-SP project and is about integrating new thematic communities. A preliminary plan is outlined, explaining the general requirements for obtaining the status as new Thematic Core Service (TCS) in EPOS. In addition, general requirements for integration of the underlying services are presented. There are currently two thematic communities that have shown interest in becoming a new TCS in EPOS. These are the Earthquake Engineering Community (EE) and the Tsunami Research Community (TS). The latter, has already applied for the status of candidate TCS. In addition, a third community on exploration geophysics, is considering integration to EPOS. In this report, current status of the plans for integration of the **new thematic communities** is briefly described and guidelines in terms of technical, governance, legal and financial aspects are presented. This initiative will be followed up by preparing the formal Implementing Rules, Section 2 of EPOS-ERIC, and preparing an appropriate road map for integrating the new thematic community in concern, with a suitable timeline to be further discussed within the relevant bodies of EPOS-ERIC.

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1. Introduction

Within the framework of the European Project EPOS-SP (European Plate Observing System – Sustainability Phase) supported by the H2020 program of the European Commission (Grant Agreement No. 871121), a dedicated task (T4.2) under the Work Package, Increasing Value for Users (WP4), is formed with the intention of planning the integration of new thematic communities to EPOS and creating a procedure for a clear roadmap of integration of their services. The main objective of this task is to develop mechanisms and procedures for future integration of new thematic communities in the EPOS Delivery Framework.

In this document, procedures and criteria for integration of new thematic communities in EPOS are briefly described and guidelines for the **new thematic community on Tsunami Research** are presented in terms of technical, governance, legal and financial aspects.

2. Integration of new thematic communities

Integration of new thematic communities as a new Thematic Core Service (TCS) in the EPOS delivery framework requires a structured approach. Here, it is important to distinguish between the integration of a new TCS representing an entire thematic community on one hand, and the integration of individual services from a given TCS on the other. The process of integrating individual services underlying a new TCS can only be done after the approval of the new thematic community as a “Candidate-TCS” is completed. In the following we first focus on the integration process of a new TCS.

Process of integration of new thematic communities in EPOS involves the following:

- 1) **Technical Readiness Assessment (TRA)** of the TCS-services (requires internal verification + external validation)
 - a) Requires verification of the services in TCS domain specific portal(s) internally by a dedicated group from TCS itself.
 - b) Requires verification of the technical integration by testing the services in concern within the EPOS-ICS by a dedicated group composed of both TCS and ICS.
 - c) Requires a written documentation for the above two points in the form of a report (TRA-report).
 - d) Requires external validation of the technical readiness of the TCS services.
- 2) **TCS Governance Readiness** (requires external validation)
 - a) Requires that the TCS has established a formal TCS-Consortium with appropriate representation from the underlying data provider community.
 - b) Requires that the TCS-Consortium has a formal governing body (e.g. TCS-Board), with details of implementing rules defined.
 - c) Requires that the TCS have selected the leading institution and the chairperson for the TCS-Governing Board.
- 3) **TCS Legal Readiness** (requires external validation)
 - a) Requires that the TCS Consortium Agreement is signed by the TCS Consortium members.
 - b) Requires legal documents making sure that the data provider institutions give their consent for redistribution of their data through both domain specific portals and later in EPOS-ICS.
- 4) **TCS Financial Readiness** (requires external validation)
 - a) Requires that the financial aspects of the TCS services in concern are defined clearly in the cost-book of EPOS services, including both in-kind contributions as well as expected dependency from other financial resources.

In the EPOS-ERIC construction, requests for integration of new TCS is first handled by the “**Service Coordination Committee (SCC)**”, which is recently established as part of the formal structure of EPOS-ERIC. SCC is a coordination body with representatives from all core services in EPOS (i.e. TCSs and ICS). SCC makes sure that for each new TCS integration process, four steps mentioned above are carried out. If needed, SCC uses expert groups for external validation processes described above. It is then **EPOS-ERIC General Assembly (GA)**, that finally **approves** the integration of a candidate TCS and **adopts** the implementation of their services, following the formal procedures established for verification and validation, seen from the technical, governance, legal and financial perspectives.

Once a new thematic community is adopted as a “Candidate-TCS”, the process of integration of underlying services to EPOS Integrated Core Services (EPOS-ICS) involves the following:

- 1) Ideally each TCS should have their services available and accessible (**following open access and FAIR principles**) in their domain specific portal(s).
- 2) These available services from TCS, should then follow the defined protocols for metadata integration (**EPOS-DCAT-AP**) and should give access through **web-services** where the data provided can be searched and accessed using specific query parameters, and further can be displayed in a desired way.

After the above steps are done then the TCS services need to be **verified internally and validated externally**. The final approval process is conducted by the General Assembly of the EPOS-ERIC.

3. Guidelines for Integration of New Thematic Communities

Following is a short guideline that summarizes the relevance of the required criteria for the process of integration of new thematic communities and their services. Criteria numbers below refer to the four dimensions mentioned in Chapter 2 above.

- **Regarding Technical Readiness:**
 - **Criteria 1a:**
 - Identify and select relevant TCS specific data portals for inclusion in EPOS.
 - Requires **internal verification**.
 - Requires documentation.
 - **Criteria 1b:**
 - Identify individual DDSS elements from the concerned thematic community that are ready to be integrated to EPOS.
 - Prepare for integration including timeline, resources and well-identified responsibilities among participating institutions.
 - Execute the integration of selected (prioritized) DDSS elements together with ICS experts.
 - **Internally verify** the technical readiness of the implemented (integrated) services.
 - **Criteria 1c:**
 - **Report** on the outcome of the technical readiness assessment.
 - **Criteria 1d:**
 - Establish user feedback groups (UFG) for **external validation** of DDSS elements that are integrated to EPOS through the ICS.
 - Execute **extensive testing** of the relevant TCS services following the Pilot Operational Testing (POT) procedures, including both technical testing of services and user testing.
- **Regarding Governance Readiness:**
 - **Criteria 2a:**
 - Identify the members of the new thematic community in concern.
 - Establish appropriate representation with data provider communities included.
 - Establish the formal TCS Consortium (to be formally established by a legal agreement – see Criteria 3a below).
 - **Criteria 2b:**
 - Establish the TCS Board as the governing body of the TCS Consortium.
 - **Criteria 2c:**
 - Identify the leading institution for the TCS Consortium.
- **Regarding Legal Readiness:**
 - **Criteria 3a:**
 - TCS Tsunami Consortium Agreement is signed by legal entities constituting the Consortium.
 - **Criteria 3b:**
 - Collect formal consent letters from the data providing community allowing redistribution of data provision in EPOS.
- **Regarding Financial Readiness:**

- **Criteria 4a:**
 - Identification of cost-categories for different services
 - TCS Governance and Coordination service,
 - TCS Virtual Access (VA) services,
 - TCS Transnational Access (TA) services.
 - Completing the cost-book of EPOS with relevant information including
 - In-kind resources,
 - In-kind contributions,
 - Cost of the individual services,
 - Dependency on EPOS-ERIC funding.

4. Concluding remarks

Currently in EPOS there are **nine TCSs that are validated**. These are TCSs in seismology (SEIS), near fault observatories (NFO), GNSS data and products (GNSS), Volcano Observations (VOL), Satellite data products (SAT), Geomagnetic Observations (GEOMAG), Anthropogenic Hazards (AH), Geological Information and Modelling (GIM), and Multiscale Laboratories (MSL). The TCS in Geo-Energy Test Beds for low-carbon energy (GETB) is not yet validated and remains as a candidate TCS. In addition, a formal application from the Tsunami Research Community is being considered for adoption of the status of a new candidate TCS.

EPOS ERIC Facility Access validation document

Written by the TNA Working Group, which includes representatives of
TCS MSL, VOLC, SEIS, NFO, and candidate TCS GETB and Tsunami
shared with the EPOS ERIC Executive Coordination Office and Service Coordination
Committee
to be discussed and approved by the EPOS ERIC General Assembly

Version 3.1 – June 25th, 2021

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1. Abbreviations and definitions

a. Abbreviations

CB: Consortium Board
DCAT-AP: Data Catalogue – Application Profile
EPOS: European Plate Observing System
ERIC: European Research Infrastructure Consortium
GDPR: General Data Protection Regulation
ICS-C: Integrated Core Service – Central hub
SEC: Scientific Evaluation Committee
TCS: Thematic Core Service

b. Definitions

Facilities: Facilities, observatories, laboratories, stations, platforms, research vessels, equipment, resources and services that are used by the research communities to conduct research and foster innovation in their fields. They include but are not limited to; major scientific equipment (or sets of instruments), knowledge-based resources such as collections, archives and scientific data, e-infrastructures, such as data and computing systems and communication networks and any other tools that are essential to achieve excellence in research and innovation.

Users: Individuals, teams and institutions from academia, business, industry and public services, which are engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of projects. Teams can include, but are not limited to, researchers, doctoral candidates, technical staff and students participating in research in the framework of their studies.

Access: The legitimate and authorised physical, remote and virtual admission to, interactions with and use of Facilities and to services offered by Facilities to Users. Such Access can be granted, amongst others, to machine time, computing resources, software, data, data-communication services, trust and authentication services, sample preparation, archives, collections, the set-up, execution and dismantling of experiments, education and training, expert support and analytical services.

2. Preamble

This document contains the rules to which each TCS must conform to validate their Facility Access service as an EPOS ERIC service.

This document is part of the EPOS 2021-2023 Service Activation Roadmap. The Service Activation Roadmap specifies that the Multi-Year Collaboration Agreements with TCS for Facility Access Coordination and Provision will cover the activation of Facility Access coordination and provision, assessing the legal and governance frameworks for operating Facility Access calls, clarifying the financial dimension for approving the eligibility, and making the Facility Access service fully operational. A Multi-Year Collaboration Agreement will be signed by EPOS ERIC and the Facility Access Coordinator to create the collaborative framework to monitor its operation and to discuss the financial eligibility of the TNA provision.

Facility access covers legitimate and authorised physical and remote admission to, interactions with, and use of, Facilities services offered by Facilities to Users. In this document the relations between EPOS ERIC and the TCS Stakeholders (TCS Consortium Board, Facility Access Coordinator, Facility Access Providers, Facility Access Users) are set out.

Attached to this document are the implementing rules for Facility Access validation, which contains criteria and means of verification to which each Facility Access providing TCS must conform. The implementation of Facility Access will take place at the TCS-level, rather than at the EPOS ERIC level.

This Facility Access Validation document will be presented to the EPOS ERIC Executive Coordination Office, then to the Service Coordination Committee, and lastly to the EPOS ERIC General Assembly.

3. Introduction to Facility Access

In the context of EPOS Facility Access we identify the following:

- There are three types of Facility Access; Physical, Remote, and Virtual.
 - **Physical Access:** Involves hands-on access of Users (i.e. a physical visit to the Facility) – access to limited resources for which competitive selection is needed.
 - **Remote Access:** User does not visit the Facility physically – access to limited resources for which competitive selection is needed.
 - **Virtual Access:** User does not visit the Facility physically – access to unlimited resources for which competitive selection is not needed.
- There are three modes for Facility Access; Excellence-driven, Market-driven and Wide.
 - **Excellence-driven Access:** exclusively dependent on the scientific excellence, originality, quality and technical and ethical feasibility of an application evaluated through peer review conducted by internal or external experts. This Access mode enables collaborative research and technological development efforts across geographical and disciplinary boundaries.
 - **Market-driven Access:** applies when Access is defined through an agreement between the User and the Facility that will lead to a fee for the Access and that may remain confidential.
 - **Wide Access:** the broadest possible Access to scientific data and digital services provided by the Facility to Users.

For validation of Facility Access as an EPOS service we consider only access to limited resources, i.e. Physical and Remote Access, based on the Excellence-driven Access mode. Market-driven and Wide Access will not be part of the EPOS Facility Access service but may be facilitated through the ICS-C facility access brokering system.

The nature of Facility Access calls (e.g. continuous or time-limited, open scope or defined scope) will be determined by the respective TCS.

The purpose of Facility Access is to allow cross-border or national short-term access to world-class Facilities to foster collaborations and exchanges of experience. Facility Access can include national and trans-national access, but excludes intra-institutional access.

The aims of Facility Access include, but are not limited to:

- Foster open science and innovation
- Promote cross-border and national access to research facilities
- Enhance collaborations and exchange of experience and best practices
- Increase efficient and effective use of instrumentation

4. Stakeholders and their roles

In this section the stakeholders and their roles within the Facility Access process and governance framework are described. This is also shown in Figure 1 below.

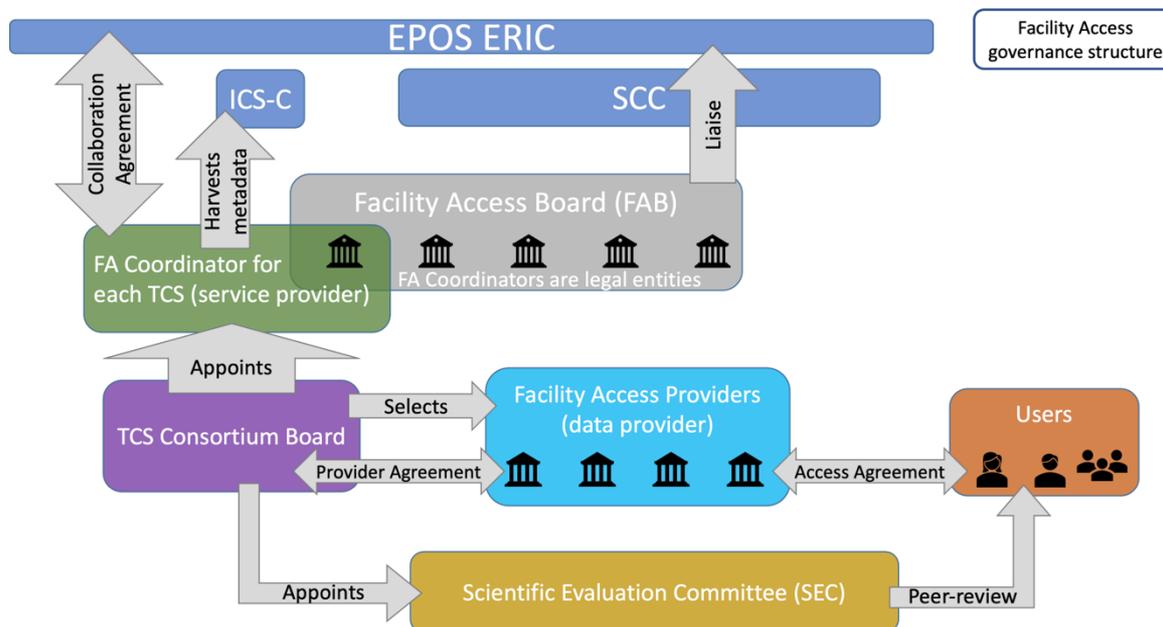


Figure 1 - Facility Access Stakeholders and governance structure

a. EPOS ERIC

EPOS ERIC is responsible for approval of this validation document.

EPOS ERIC validates the Facility Access service for individual TCS according to the validation criteria as set out in this validation document.

EPOS ERIC is a potential funding entity for all aspects of Facility Access.

b. ICS-C

The ICS-C is responsible for provision and technical maintenance of the Facility Access Brokering System.

The harvesting of Facility Access information from TCS by the ICS-C is not part of validation of Facility Access as an EPOS ERIC service.

c. Facility Access Board

The Facility Access Board consists of the Facility Access Coordinators of each Access-providing TCS. The responsibility of the Facility Access Board is to liaise between EPOS ERIC and across the TCS. The Facility Access Board could be integrated in the SCC, or act as a permanent advisory board reporting to the SCC.

d. Facility Access Coordinator (service provider)

The Facility Access Coordinator is a legal entity and part of, or appointed by, a TCS consortium. Each TCS' Facility Access Coordinator signs a Collaboration Agreement with EPOS ERIC upon validation of the respective Facility Access as an EPOS ERIC service. The FA Coordinators can therefore be viewed as Service Providers.

Tasks of the Facility Access Coordinator include, but are not limited to:

- Continuous management of the Facility Access calls
- Management of the application procedure
- Coordination of the Facility Access Users and Providers
- Perform Risk assessment for each Facility Access call
- Coordination of the Scientific evaluation committee
- Management of the Facility Access documents
- Financial management
- Reimbursement of the Facility Access Provider and/or User using EPOS funds
- Liaising with EPOS ERIC and other stakeholders
- Reports to the TCS CB
- Interaction with the ICS-C
- Advertisement of the Facility Access calls

e. Facility Access Provider (data provider)

A Facility is required to provide the following information to be eligible to become a Facility Access provider:

- Description of research infrastructure and its installations according to EPOS Facility Access metadata model
- Financial and reimbursement information based on unit costs, actual costs, or a combination thereof, as specified under the Research Infrastructures Part of the Horizon 2020 Framework Program

The TCS CB is responsible for setting the criteria and defining the process to select Facilities that are eligible become a Facility Access Provider.

The legal entity representing a Facility must sign a Provider agreement with the TCS CB for the Facility to become a Facility Access Provider. They can be viewed as Data Providers in the EPOS ERIC context. Facility Access Providers do not need to be linked parties or otherwise included in the TCS consortium.

The Facility Access Provider is responsible for:

- Providing technical and scientific support to the Facility Access Users
- Training Facility Access Users on equipment and software when deemed necessary
- Providing support for other operational demands during and prior to the access. These may include, but are not limited to, information about a) on-site health and safety regulations, b) accommodation in remote places, c) visa and other local regulations
- Finalizing Access Agreements with the Facility Access User to formalize the Access provision

f. Facility Access User

Facility Access Users can be individuals or teams from academia, public services, or private sector, who can conform themselves to i) the EPOS Data Policy, and ii) the excellence-driven access mode.

A Facility Access User is required to sign an Access Agreement with the Facility Access Provider and conform themselves to the therein specified rules (section 8C).

g. TCS Consortium Board

The TCS Consortium Board (CB) is responsible for i) appointing the TCS Facility Access Coordinator, ii) periodically reviewing the Facility Access procedures (section 6), and iii) approving and appointing the Facility Access providers.

The TCS CB is responsible for the approval and integration of the Facility Access activities in the framework of the TCS workplan.

h. Scientific Evaluation Committee

Each TCS offering Facility Access puts in place a Scientific Evaluation Committee (SEC) that will be composed of experts in the relevant geoscience field. The purpose, mandate, composition and appointment of SEC members is the responsibility of the TCS. The SEC members will be instructed to report conflict of interest.

The SEC is responsible for the peer-reviewed evaluation of the Facility Access applications.

5. Finances

In this section the financial structures for EPOS Facility Access are described. The section focuses on the financial connection between EPOS ERIC, the Facility Access Coordinator, the Facility Access Provider, and the Facility Access User. Having the financial structures in place is part of the Facility Access validation, having the necessary budget to run Facility Access as an EPOS ERIC service is not part of validation. The costs related to Facility Access are reported by each TCS in the Costbook.

The reimbursement schema containing two scenarios is shown in Figure 2 below.

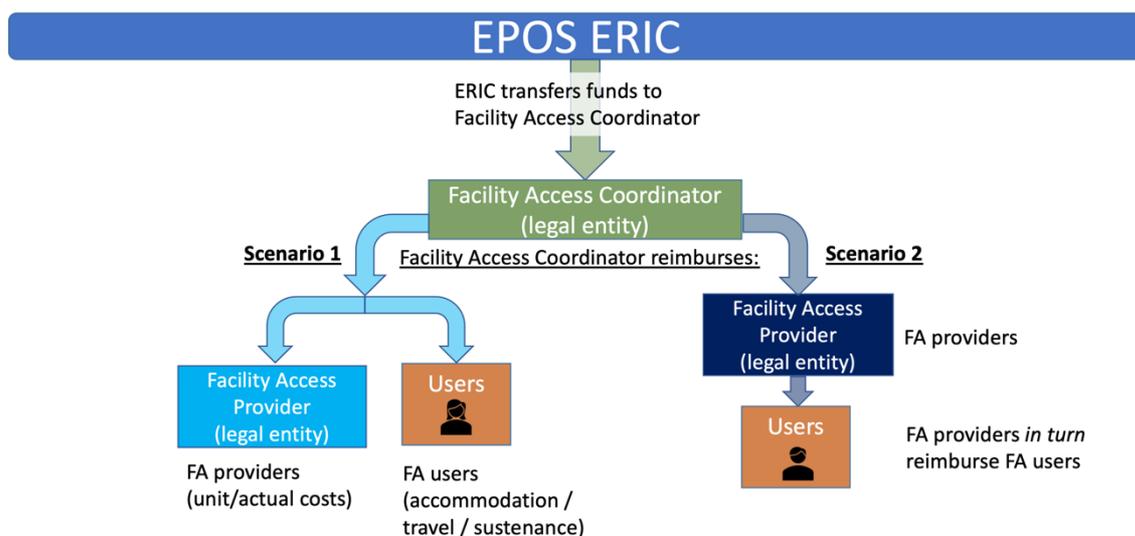


Figure 2 - Proposed reimbursement schema for Facility Access

a. Funding source

EPOS ERIC is the only funding source concerned here. Other funding sources can have their own funding limitations and reimbursement requirements.

b. Facility Access stakeholders potentially funded by EPOS ERIC

Facility Access stakeholders that can be funded in full or partly by EPOS ERIC funds may include:

- Facility Access Coordinator(s)
- Facility Access Provider(s)
- Facility Access User(s)

The funding that EPOS ERIC allocates to the respective components needs to be agreed upon between EPOS ERIC and each TCS CB annually.

c. Reimbursement scenario

Below are two scenarios for the distribution of EPOS ERIC Facility Access funds for the reimbursement of the Facility Access providers and Facility Access users.

Scenario 1:

- i. EPOS ERIC transfers funds to Facility Access coordinating legal entity,
- ii. Facility Access Coordinator reimburses:
 - a. Facility Access Providers, based on unit costs, actual costs, or a combination thereof,
 - b. Facility Access Users.

Scenario 2:

- i. EPOS ERIC transfers funds to Facility Access coordinating legal entity,
- ii. Facility Access Coordinator reimburses Facility Access Providers, based on unit costs, actual costs, or a combination thereof,
- iii. Facility Access Providers reimburse Facility Access Users.

d. Financial reporting

Every legal entity or natural person that receives EPOS ERIC funding under the reimbursement scenarios specified in section 5C must follow the financial reporting requirements set out in the following agreements:

- Framework agreement between EPOS ERIC and the Facility Access Coordinator for the respective TCS,
- Provider agreement between the TCS CB and the Facility Access provider,
- Access agreement between the Facility Access Provider and the Facility Access User.

6. EPOS Facility Access Procedure

The Facility Access Procedure describes the processes and interactions related to Facility Access. The Facility Access Procedure is based on the principles of non-discrimination and transparency, inspired to provide equal opportunities and encouraging the access by new users.

Access procedures will consist of, at least, the following components:

- Eligibility check
- Feasibility check
- Scientific review & Proposal selection
- Legal documents
- Call evaluation

Each of these components is described in detail below and the workflow is shown in Figure 3.

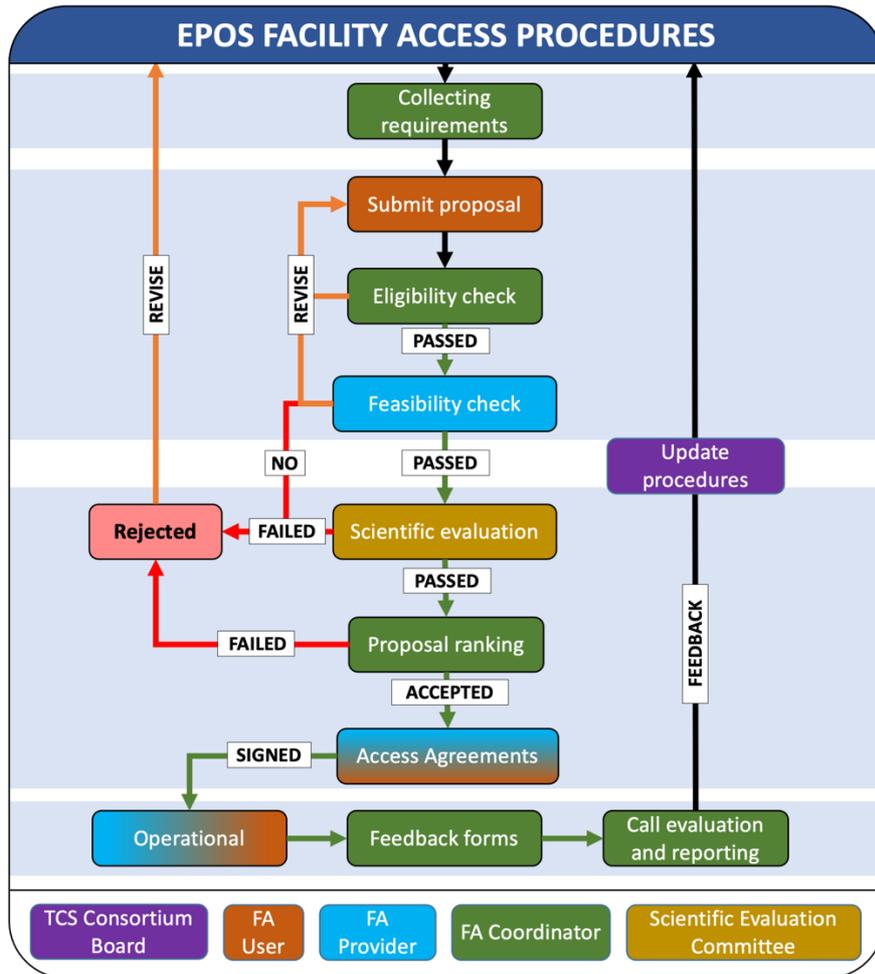


Figure 3 - Access procedures for EPOS Facility Access

a. Eligibility check

The eligibility check verifies the eligibility of a User and their application for a specific Facility Access call. The eligibility check will be performed by the Facility Access Coordinator of the respective TCS. The eligibility criteria encompass admissibility, legal, and ethical criteria.

i. Admissibility criteria

- Check if a User is fulfilling the requirements of the specific Facility Access call (e.g. transnational vs national: call specific).
- Check if a Facility Access application is complete (e.g. completeness of proposal).

ii. Legal and ethical criteria

- Application complies with law and regulations of the provider country and institution.
- Application is compliant with the European Code of Conduct for Research Integrity (e.g. avoiding fabrication, falsification, plagiarism or other forms of research misconduct).

b. Feasibility check

The feasibility check to verify the feasibility of the application, this check is done by the Facility Access Provider.

i. Logistical, technical, financial, and risk criteria

- Technical evaluation of the requested access (e.g. feasibility of the project with the requested infrastructure and equipment),
- Financial evaluation of the requested access (e.g. maximum budget),
- Logistical evaluation of the requested access (e.g. timeframe),
- Risk evaluation of the requested access (e.g. volcanic eruption).

c. Scientific review & Proposal selection

The Excellence-driven access requires peer-review of the proposal through a selected panel of experts, where the composition and functioning of the panel is based on principles of transparency, fairness and impartiality. The purpose, mandate, composition and appointment of a Scientific Evaluation Committee should be regulated by the respective TCS CB. The scientific review process is coordinated by the Facility Access Coordinator of the respective TCS.

The scientific review will be done using a scoring system with criteria based on Excellence should include:

- Scientific Excellence
- Originality
- Quality
- Relevance to the call

Additional evaluation criteria can be tailored to a specific Facility Access call by the Facility Access Coordinator of the respective TCS. The scoring system must be approved by the TCS CB.

The outcome of the scientific review, using a predefined scoring system, is a ranked list of all proposals submitted to the call. For each call a minimum score for approval must be set by the TCS CB. If resources are limited during a call (e.g. budget, availability), the minimum score can be increased accordingly, or additional procedures can be put in place by the TCS CB. The proposal approval process is managed by the Facility Access Coordinator.

d. Legal documents

The following documents are required to ensure smooth operation of the Facility Access process. The requirements for these documents are set out in section 8.

- Data policy,
- Privacy policy,
- Access agreement between Facility Access User and Facility Access Provider,
- Provider agreement between Facility Access Provider and Facility Access Coordinator.

e. Call evaluation

The call evaluation process for each Facility Access call should consist of these components:

- Setting the feedback requirements.
- Collecting feedback from Facility Access User, Facility Access Provider and Scientific Evaluation Committee.
- The Facility Access Coordinator reports Facility Access call summary statistics and feedback to the TCS CB and proposes updates to the Facility Access procedure (if any).

7. EPOS Facility Access technical components

Each TCS is responsible for the implementation of the technical necessities needed to operate Facility Access. This facility access system consists of two components: a) a Facility Access coordination module, which enables coordination of Facility Access, and b) a registry, where information relevant to the Facility Access activities is stored.

A third system, outside the scope of the TCS, is used to advertise Facility Access. This Facility Access brokering will be embedded in the ICS-C framework and is not part of the validation of Facility Access as an EPOS ERIC service.

a. Facility Access coordination module

The Facility Access coordination module is aimed at ensuring smooth operation of Facility Access provision at the TCS level. The module may contain various technical solutions aimed at supporting the Facility Access coordinator in the Facility Access procedure. The technical implementation is the responsibility of the TCS.

b. Facility Access registry

The Facility Access registry is a database containing relevant information for Facility Access, implemented at the TCS level. The technical implementation is the responsibility of the TCS, but any system needs to be compliant with the EPOS-DCAT-AP model and harvestable by the Facility Access brokering system.

c. Facility Access brokering system

The Facility Access brokering system will showcase information (in the EPOS ERIC ICS-C environment) related to the Facility Access calls, Providers and Facilities. It harvests information from the Facility Access registries at TCS level. The Facility Access brokering system needs to be compliant with the EPOS-DCAT-AP model.

8. Legal components

a. Data policy

The data policy is a document aimed at users to set the principles for the use, sharing, and exploitation of and the access to data, data products and digital tools. Facility Access in the EPOS context adheres to the EPOS data policy.

b. Facility Access privacy policy

Since personal data is collected during the Facility Access process, measures must be put in place to comply with the European General Data Protection Regulation (GDPR).

- Each TCS needs to make available a Privacy policy, stating which personal data are collected for Facility Access purpose on TCS level, how these are collected, where and for how long this is stored, who has access to the information and how you can request to remove this data. If applicable, this document can refer to EPOS Privacy policy.
- Each Facility Access Provider should have a privacy policy, stating which personal data are collected for Facility Access purpose at the Facility Access Provider level, how these are collected, where and for how long this is stored, who has access to the information and how you can request to remove this data. If applicable, this document can refer to EPOS Privacy policy. This should be part of the Access Agreement.

c. Access Agreement

An Access Agreement between the Facility Access User and Facility Access Provider should include the rules of the access provision itself, involving topics such as finances, schedules, access rules, health and safety rules, compliance with EPOS data policy, Facility Access privacy policy. The template of the access agreement document is drafted by the Facility Access Coordinator and approved by the TCS CB. The Facility Access Provider is responsible for finalizing the access agreement document with each Facility Access User.

d. Provider Agreement

A Provider Agreement between each Facility Access Provider and the TCS CB includes:

- The responsibilities of the Facility Access Provider.
- A commitment by the Facility Access Provider to provide access to Users within the EPOS Facility Access framework.
- A commitment to provide equipment info according to the EPOS Facility Access metadata model.
- A commitment to determine Facility Access provision costs based on unit costs, actual costs, or a combination thereof, as specified under the Research Infrastructures Part of the Horizon 2020 Framework Program.
- A decision on which reimbursement scenario will be used.

e. Multi-Year Collaboration Agreements with TCS for Facility Access Coordination and Provision

The Facility Access Coordinator and EPOS ERIC sign a Collaboration Agreement that conforms to the definition by EPOS ERIC upon validation of Facility Access as an EPOS ERIC service.