



Guidelines for proposers

2024 SAF€RA joint call

*Health and safety implications of
industrial digital twins and
algorithmic management*

April 2024

SAF€RA is a partnership between 16 research funding organizations from 12 European countries who collaborate on research programming and launch joint calls in the field of industrial safety. It prolongs the work developed in the SAF€RA ERA-NET, which was funded by the European Union's Seventh Framework Programme for research technological development and demonstration.

SAF€RA is a partnership between research funding organizations working in the field of industrial safety in Europe. SAF€RA publishes joint calls for proposals on various topics related to industrial safety and organizes dissemination activities to ensure that research results lead to improvements in safety management. This document describes the 2024 call for proposals, on *Health and safety implications of industrial digital twins and algorithmic management*.

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1. Call topics

Topic 1: Health, safety and sustainability applications of industrial digital twins

Many industry sectors are seeing interest in digital twins for applications such as process optimization, design-for-maintainability and lifecycle management. The call aims to explore the potential of these technologies for improving health and safety in the workplace, including the intersection with safe-and-sustainable-by-design (SSbD) principles. Projects analyzing applications in the hydrogen economy and the circular economy are welcome.

A digital twin is a digital representation of a physical process or asset that spans its full lifecycle, is updated from real-time observations, and uses simulation, visualization and machine learning technologies to help make better decisions and improve performance. The digital twin has predictive capacity concerning the behaviour of the real system when exposed to various input conditions, and can be used for a variety of applications including system simulation, exploring

system design options, performance improvement, maintenance optimization and lifecycle management.

Given the significant cost of creating digital twins for typical industrial applications, the call does not focus on the process of building digital twins, but rather aims to explore the use of existing digital twins for safety and health applications.

This call aims to support exploratory research and innovation projects that analyse different dimensions of this emerging opportunity:

- What are the implications of the emergence of digital twin technologies for OSH and risk management experts? Do they offer opportunities for new forms of interaction between safety and health experts and other stakeholders during the various phases of the system lifecycle, which are based on anticipation rather than crisis response? Can the use of digital twin technologies allow ergonomics and workplace design considerations to be taken on board earlier in the system lifecycle (design-for-maintainability, design for disassembly/deconstruction)?
- Exploration of health and safety-related trade-offs in system design and operation.
- What are the possibilities and key limitations in training applications, in simulation-based capacity-building exercises?
- Analysis of the opportunities that arise from the overlap between digital twin technologies and safe-and-sustainable-by-design principles, as well as the possible links with inclusion-by-design principles (taking user/worker diversity on board during the design process, accessibility issues).
- Use of digital twins for risk analysis and in the development of safety cases. What opportunities exist for coupling a digital twin with consequence assessment models traditionally developed for risk assessment (models of hazardous phenomena, of atmospheric dispersion, evacuation models)?
- What are the implications of these innovations for safety authorities and inspectorates? They will wish to produce critical assessments of the quality of designs and operating procedures that have been developed with the support of digital twin technology. What are the implications for their access to relevant expertise? How can they ensure a sufficient level of independence of their analysis when they rely on tools provided by the industry they are overseeing? What are the implications for intellectual property of design elements and software tools?

We welcome case studies and applications in a variety of areas, including:

- Hydrogen infrastructure in which safety and health for users, operators and neighbors of the equipment or facilities are essential considerations to integrate from the design phase.

- Facilities associated with the circular economy, and product design integrating maintainability and anticipating end-of-life.
- Facilities or equipment in high-hazard industry sectors (the process industries, transport, energy, etc.).

Topic 2: Impact of algorithmic management on worker well-being and accident rates

Several case studies from the USA have shown that the introduction of algorithmic management technologies and automated systems that monitor, evaluate, influence and control worker behaviour in workplace settings can improve declared accident rates. At the same time, their impact on the privacy, dignity and well-being of workers is profound. The call aims to explore the lived experience of these technologies and management practices, and their possible impacts on health and safety in the workplace.

Projects are invited concerning:

- a wide range of surveillance/assistance technologies, such as video surveillance tools including real-time monitoring (level of attention, procedural conformity), operator-assistance technologies that monitor for deviations from a presumed-safe operating trajectory, assistants such as tablets that guide the worker in their task and can capture photographic evidence of different phases of a task, smart wearables that record location data and biophysical parameters of the user, smart PPE, helmet-mounted cameras and communication devices that allow an offsite expert to interact with a front-line worker to provide advice, collaborative robots (cobots) in workplace settings.
- a range of algorithmic management practices introduced in the platform economy, in particular app-driven task allocation, AI-driven worker assistance technologies and performance monitoring tools.

Possible questions of interest:

- Using a case study methodology, what evidence is available concerning the impacts on health and safety for workers and for other stakeholders?
- How are ethical concerns regarding the privacy and the well-being of workers treated? Are aspects of existing regulation (GDPR, EU AI Act) relevant and sufficient regarding these impacts?
- What is the lived experience of these management practices and technologies? What factors influence users' and workers' perceptions and acceptance of these new forms of surveillance/assistance? How can the associated psychosocial risks be managed? What impacts on worker autonomy and professional expertise?
- Are "explainable AI" techniques relevant to the debate between designers, developers,

users and targets of these surveillance/assistance technologies regarding privacy, well-being, health and safety?

2. Call objectives

Scope of the call. The scope of the call includes research on the management of industrial risk, avoiding major impacts on the environment or society, as well as research on products and systems required to improve safety in industrial settings. Industries involved include, among others, the process industries, energy, dangerous goods transport, construction and operation of major infrastructure and services. The scope includes occupational safety as long as there is a relation with major accident hazards in industrial settings. For example, if research primarily with an occupational safety perspective aims to prevent an accident sequence which could also lead to off-site consequences, then it is included in the scope.

Most projects funded within this joint call will be relatively small (2 to 4 partners, duration between 12 and 36 months, with budgets typically between 20 and 150 k€ per project partner). The call aims to fund mainly **applied research** and innovation projects carried out in universities and research institutes, though proposals from industry may also be eligible if they contain a significant research component. **Interdisciplinary research** is encouraged. Cooperation and joint activities between different consortia funded within the call will be encouraged. Research proposals which adopt a comparative approach (analyzing similarities and differences between different European countries, between different industry sectors, between large and small organizations, etc.) are encouraged.

General remarks

- The research teams within a consortium should include investigators of complementary scientific disciplines and research areas necessary to address the proposed research aims.
- Given the applied nature of the topics, the participation of stakeholders within the project (either as subjects of investigation, or partners contributing to the work) is encouraged.
- Proposals should contain novel, ambitious aims and ideas, combined with (in full proposals) well-structured work plans. The scientific methodology should be described (in full proposals) in sufficient detail to allow reviewers to assess its quality.

3. Funding rules

Funding organizations participating in the joint call will provide funding for a maximum of three years for transnational, collaborative projects, according to the conditions described in Annex 1.

The eligibility rules and funding principles will follow the regulations of the national/regional

funding organization(s) to which the application for funding is addressed. Final funding decisions will be made by the national or regional funding agencies and research institutes. The scientific evaluation process will be made at a European level by a panel of independent experts.

Funding will be provided through direct contracts between participating SAF€RA funding organizations and the selected research teams. This means that each organization receiving funding is subject to the rules and regulations of their respective national/regional funding organization. Note that eligible costs and funding rates vary according to the national/regional funding organization (see Annex 1 for details).

4. Eligibility criteria

Eligible consortium structure. In order to foster transnational collaboration, projects funded within this joint call will involve the collaboration of at least two research teams in two eligible countries. All EU member states plus the Republic of Serbia and the United Kingdom are eligible countries; please see Annex 1 for details of the funding available for organizations in each country.

Researchers requesting support for their project may submit either:

- A **transnational consortium pre-proposal**, comprising at least two partner organizations from two eligible countries;
- A **single-nation pre-proposal**, comprising one or more organizations from a single eligible country. In this case, the organization(s) accept the principle of a collaboration with one or more other organizations from one or more other eligible countries. After evaluation of the pre-proposals, the Call Steering Committee will suggest grouping two or more single-nation pre-proposals into a transnational consortium, based on their thematic and methodological complementarity. Please note that there is no guarantee that an appropriate matching can be found by the Call Steering Committee.

In the second stage of the call, full proposals are to be submitted by a transnational consortium, which must comprise at least two consortium partners from two eligible countries.

Furthermore, additional consortium partners, not eligible for SAF€RA funding, may participate in the projects on the basis of self-financing. Such partners should state the source of funding for their contribution to the proposal and the conditions under which their funding will be available.

Eligible organizations. The funding scheme targets institutional collaboration: private individuals may not apply independently. Proposals are primarily expected from research teams from universities or public research/expertise organizations. However, some funding organizations participating in the present call can also fund researchers from industry (SMEs or large firms) or

from NGOs¹ (see Annex 1 for details).

Other comments:

- Most funding organizations are only able to fund research undertaken within their country or region. Check Annex 1 for details.
- Consortia may not request all their funding from the same SAF€RA funding organization.
- The **duration of funding** requested should be compatible with that supported by the funding organization(s) requested during application. All projects will concern durations between 12 and 36 months. The funding durations requested from each funding organization may be different (but should be clearly specified in the response form).
- The **expected funding per project partner** is typically in a range between 20 k€ and 150 k€ (check Annex 1 for available budgets and acceptable project size for each funding organization).
- Some funding organizations are able to provide funding only if applicants are able to provide **co-funding** from industry or from another research funding organization. Check Annex 1 for details.
- The roles of each partner within the consortium should clearly add value to the objectives of the proposed project.

The list of funding organizations participating in the call is provided in Annex 1.

5. Application procedure

The joint call will use a **two-stage application process** with a pre-proposal mechanism for the first stage, according to the schedule outlined below.

Action	Date
Joint call is launched	April 4 th 2024
Deadline for submission of pre-proposals	June 12 th 2024
Information sent to applicants on results of the first stage. Requests for full proposals are sent to selected applicants, and collaborations proposed to single-nation applicants.	June 21 th 2024
Deadline for submission of full proposals	19 th September 2024
National funding decisions transmitted to applicants	28 th November 2024
Projects start	Beginning 2025

¹NGO: Non-governmental organization.

Pre-proposals (maximum of 5 pages) will be checked for validity and relevance by the SAFERA Call Steering Committee. The Call Steering Committee will also propose possible cooperation between single-nation applications at this stage. A subset of the first stage applications, selected by the Call Steering Committee on the basis of their eligibility and their relevance, will be requested to prepare a full proposal, as a transnational consortium, to be submitted in the second stage. Second stage proposals will then be assessed by the Evaluation Panel.

Organizations submitting a project are invited to use the pre-proposal form (maximum of 5 pages, in English) available on the call website. Applications in the first stage (pre-proposals) must be made by email to applications@safera.eu, before the submission deadline specified on SAFERA's website. Applicants will receive a confirmation email within one working day. Applications should not be sent directly to the participating national/regional funding organizations.

Project coordinator. Researchers submitting a pre-proposal must designate a project coordinator, who will lead the consortium through the application procedure and is fully responsible for the overall project coordination. All communication with the Call Secretariat will be through the project coordinator, who should disseminate information to all parties to the proposal.

Confidentiality. Proposals and any information relating to them shall be handled in confidence, and only be made accessible to the organizations involved in the funding and the experts involved in the evaluation process. Proposals shall not be used for any purpose other than the evaluation of the applications, making funding decisions and monitoring of the project.

Projects selected for funding shall have a summary of their project published on the SAFERA website, and all relevant project deliverables will be disseminated by SAFERA, as a complement to dissemination activities undertaken by the projects.

6. Call management

Two boards, the Call Steering Committee and the Evaluation Panel, will manage the evaluation process of the joint call with the support of the Call Secretariat. The process includes the eligibility and relevance check of the proposals, the evaluation of the proposals and the final selection and award of research funding.

The **Evaluation Panel** is a panel of internationally recognized scientific experts within the disciplines identified as being relevant for the call topic, responsible for the evaluation of submitted proposals. Evaluation Panel members will not submit or participate in proposals within the call, and will accept a confidentiality agreement. The work of the Evaluation Panel will be organized so as to avoid conflicts of interest.

The **Call Steering Committee** is composed of a representative from each SAFERA funding

organization participating in the joint call. All decisions concerning the call procedures will be made by the Call Steering Committee. It will supervise the progress of the call and the evaluation of proposals. The Call Steering Committee will make funding recommendations to the national/regional funding organizations regarding the proposals to be funded, based on the final ranking list provided by the Evaluation Panel. It will accompany the entire lifespan of the Call, evaluates the performance of the projects and resolves potential disagreements which may arise during the lifetime of the projects.

7. Evaluation process

A centralized evaluation of the full proposals will be performed by the Evaluation Panel and the Call Steering Committee. Based on the result of the evaluation, projects will be recommended (or not) for funding by the organizations concerned. Note that the national/regional organizations will make the final funding decisions.

The **evaluation criteria** are:

- Compatibility with the call topics
- Scientific or technological excellence
- Expected outcomes (scientific & operational)
- Project implementation

These criteria and the associated weightings are described in more detail in the *Guidelines for evaluators* document, which applicants are free to consult.

Each proposal will be allocated to at least two external reviewers and one Evaluation Panel member who fit the profile of the application. Based on the proposals' ranking established by the Evaluation Panel and on available funding, the Call Steering Committee will recommend the projects to be funded to the national/regional funding organizations.

Only proposals judged to be of high quality will be funded. If the number of proposals considered to have high quality, as judged by the Evaluation Panel, corresponds to a total requested funding which is smaller than the available budget, only part of the funds will be used. Projects not evaluated as being of high quality by the Evaluation Panel will not be funded in the context of this SAF€RA joint call.

For each proposal, the Call Steering Committee will communicate the final decisions and the evaluation report to the project coordinator.

8. Common SAF€RA activities

Reporting. The coordinators of all funded projects must submit an interim and a final (within three months of the end of the project) scientific progress project report to the Call Secretariat. All

reports must be in English and use a common report form that will be provided. The research partners are jointly responsible for the delivery of the reports, and the Call Secretariat will only accept reports delivered on behalf of the consortium, via the project coordinator.

In addition, each project partner will be responsible for the necessary reporting to their funding organization according to national/regional rules in order to obtain and maintain funding during the lifetime of their portion of the project.

Project review. As a complement to the national/regional project review process, the transnational cooperation aspects will be monitored at a SAFERA level. The project coordinator is responsible for providing concise reporting according to the requirements (publishable summary at project start, interim concise reporting and final reporting, participation in questionnaires). Any substantial change in an ongoing project must be reported promptly to the involved funding organizations. The project partners should be aware that changes might have effects on funding.

Progress seminars. Funded research projects will be required to participate once a year in a seminar organized by SAFERA partners. The seminars will be organized so as to facilitate interaction between researchers from different projects and to disseminate research results to interested parties. Funding for travel of a project representative to the seminars (which will be organized in a location in Europe and last a full working day) should be included in proposal budgets.

Dissemination. Researchers funded within the context of this call will be required to acknowledge the support of SAFERA and the specific funding organization in their publications, exhibitions, lectures and press information concerning results of SAFERA-funded projects. In addition, electronic copies of all relevant publications and deliverables must be sent to the Call Secretariat.

A public database of projects funded within SAFERA and the results of the research is maintained by the SAFERA funding organizations. All research projects funded within this call must submit all relevant data created during the lifetime of the project to this database.

9. Support

Frequently Asked Questions (FAQ) are listed on the SAFERA joint call website. In addition, all funding organizations participating in the call will provide assistance to project proposers in case of questions. General inquiries concerning the call should be addressed to the Call Secretariat, at call-secretariat@safera.eu.

Annex 1 – Specific requirements of the participating funding organizations

The following tables provide information on the available budgets, funding durations and other requirements of each participating funding organization. **Applicants must contact the national/regional funding organization for further information on eligibility.**

Concerning funding duration and available funding per applicant: applicants may request funding for a task included within a larger project, whose duration is less than the total project duration. In such cases, please identify clearly the scope of the larger project in which your requested funding is included, and specify precisely the scope of the task for which funding is requested.

All EU countries plus UK, Serbia

Organization	Institution of Occupational Safety and Health (IOSH)
Contact persons	Genis Fernandes <genis.fernandes@iosh.com>
Eligible applicants	All legal entities in the EU, the UK and Serbia
Budget	150 k€
Call topics	Topic 1.
Funding duration	Between 12 and 36 months.
Other requirements	<p>Projects/Teams must:</p> <ul style="list-style-type: none"> • Align with the IOSH strategy • Deliver an end of project summary and full report • Support IOSH with other means of dissemination

Austria

Organization	Austrian Research Promotion Agency (FFG)
Contact persons	Maximilian Morgenbesser <Maximilian.Morgenbesser@ffg.at>
Eligible applicants	All legal entities in Austria are eligible for funding.
Budget	500 k€
Call topics	Topic 1, for projects with links to SSbD principles.
Funding duration	Between 12 and 36 months.
Other requirements	<p>Consortia must include at least one company based in Austria. (For clarity, this means that a consortium consisting of one research organization outside Austria, funded by another SAF€RA member, and one Austrian company, funded by FFG, is possible.)</p> <p>Individual enterprises must account for a maximum of 70% of the eligible project costs (shares of affiliated companies)</p>

	<p>count as one enterprise).</p> <p>Cooperation between a company and one or more research institutes: research institutes must account for at least 10% of the eligible costs.</p> <p>Obligation to submit in parallel to the FFG eCall system: https://ecall.ffg.at</p> <p>Applicants selected to proceed to the second stage of the call will submit a specific annex, which must be written in English or German.</p>
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Finland

Organization	Finnish Work Environment Fund (FWEF) - Finland
Contact persons	Kenneth Johansson < kenneth.johansson@tsr.fi >
Eligible applicants	Research organizations and companies whose research may improve Finnish working life.
Budget	Between 20k€ and 150 k€ per project. Total amount of funding depends on how many applications FWEF receives and how they are rated in the evaluation (between 100 and 300k€).
Call topics	Topics 1 and 2.
Funding duration	Between 12 and 24 months.
Other requirements	Co-funding is required. Projects must include elements dealing with occupational safety, occupational health, productivity.

Italy

Organization	Italian Workers' Compensation Authority (INAIL) – Italy
Contact persons	Patrizia Agnello < p.agnello@inail.it >
Eligible applicants	Italian universities or recognized Italian Research Institutes.
Budget	120 k€ for Topic 1 and 80k€ for Topic 2.
Call topics	Topics 1 and 2.
Funding duration	24 months.
Other requirements	Co-funding covering 40% of the total cost is required.

The Netherlands

Organization	TNO
Contact persons	Dolf van der Beek < dolf.vanderbeek@tno.nl >
Budget	50 k€ of in-kind funding for TNO researchers.
Call topics	Topic 1.

Funding duration	24 months.
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Republic of Serbia

Organization	Serbian Ministry of Education, Science and Technological Development (MESTD)
Contact persons	Aleksandar Sedmak <asedmak@mas.bg.ac.rs>
Eligible applicants	Researchers working for a research organization based in Serbia are eligible.
Budget	40 k€ for a single project.
Call topics	Topics 1 and 2
Funding duration	24 months

Spain – Basque country

Organization	Instituto Vasco de Seguridad y Salud Laborales (OSALAN) – Basque country
Contact persons	M ^a Nieves de la Peña <mn-pena@euskadi.eus>
Eligible applicants	All legal entities generating economic activity in the Basque Country are eligible for funding, as long as they have not been found guilty in legal cases related to occupational health and safety within the last five years, and have no debts due to the public treasury or the social security system. The organization must comply with occupational risk regulation.
Budget	200 k€ Funding per project per year between 10 and 50k€.
Call topics	Topics 1 and 2.
Funding duration	12-24 months
Other requirements	In addition to compatibility with the call topic, projects must have some relation to occupational health and safety. Projects which are accepted for funding will need to prepare a summary of their proposal in Basque language or Spanish, including the title of the project, the objectives, the workplan, methodology and a detailed budget.