

Fast Technical Consultation

"ENERGY MEASUREMENT SYSTEMS" RAILWAY INSTALLED ON TRAIN BOARDS

Regulation of the Initiative

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1. Preface

These regulations ("Regulations") govern the procedures for participation in the scouting Initiative for technical solutions within the scope of "ENERGY MEASUREMENT SYSTEMS" RAILWAY INSTALLED ON TRAIN BOARDS (hereinafter, the "Initiative" or "Scouting"), organized and managed by Ferrovie dello Stato Italiane S.p.A. (also "FS SpA" or just "FS").

The initiative focuses on scouting innovative technical solutions described in the subsequent article 2.1 of this Regulation and will be structured through a *Fast Technical Consultation* process. The Initiative is open to companies, universities, and entities (by way of example and not exhaustive: foundations, research institutes) located in Italy or abroad (hereinafter referred to as "Participant(s)").

For matters not addressed by this Regulation, the Terms & Conditions of use and the Privacy Information related to the FS *InnoStation* website apply to the Initiative, and they can be consulted at the following [link](#).

2. Description of the Initiative

2.1. Object of the Initiative

The Initiative is organized and managed by FS SpA with the aim of identifying subjects potentially capable of designing an innovative technical proposal aimed at **creating a multicomponent test-bench for the generation of high voltage and current signals, in order to verify, validate, calibrate and certify the energy measurement systems on board the “energy.meter” train** (hereinafter, “Innovative Technical Solution” or, in the plural, “Innovative Technical Solutions”).

The Innovative Technical Solution of interest must be able to analyze and evaluate the ability of the energy meter to accurately detect and measure energy consumption, energy quality, harmonic components and catenary and electric arc parameters during train operation. The technical proposal must have internal logic for the optimization of the algorithms for reusing regenerated energy; with consequent benefits in terms of sustainability, environment, economy and maintenance.

Moreover, the subject Innovative Technical Solution must also be able to manage stimuli and process data to verify the measurement performances and the detection functions of the pantograph detachments from the catenary, for the benefit of predictive diagnostics.

The scouting will be open from November 23 to January 15, 2024, unless extended.

Specifically, the Scouting is aimed at those who are able to present products, proposals and expertise aimed at the realization of a test system for generating high voltage and current signals, applicable to an on-board train EMS (Energy Measurement System). More in detail:

- **Generation of high voltage and high current signals** with associated “power quality” events (harmonic frequencies, pantograph arc simulation) to be applied to an on-board train energy measurement system (“EMS”) as a “device under test” (DUT);
- **Acquisition of raw data of energy samples and automatic drafting of evidence of EMS** functionality according to European industry standards. Verification of the DUT's ability to accurately detect (defined by strict minimum requirements as per European standard) AC/DC energy consumption, the quality of the energy absorbed/regenerated, the rate of harmonic components, catenary parameters, pantograph catenary electric arcs during train operation;
- Regarding the quality of the regenerated energy, **application of stimuli to maximize the DUT's ability to manage energy and avoid its dissipation** with multiple advantages in terms of sustainability, environment, economy and maintenance;
- **Application of data-processing algorithms** for optimization analysis of economic, environmental and performance aspects of energy expenditure for the movement of railway rolling stock;
- **Replay of pantograph detachment events from the catenary** associated with the position of the train along the track, to verify the DUT's ability to detect such events. This functionality, if present on the EMS, is useful to perform predictive diagnostics on catenary and/or pantograph status.

2.2. Stages of process and Initiative dates

The Initiative will commence on 22/11/2024 and conclude on 15/12/2024, unless extended. Participating entities will have the opportunity to submit the required information, enabling the analysis of proposed technical solutions, through the completion and transmission of the submission form (participation application). The phase for receiving participation applications will conclude at 13:00 on 15th December 2024, and after this deadline, participation in the Initiative will no longer be possible. Information about the initiative and the corresponding privacy policy can be accessed online on the *Innovation* website ([link Innovation Initiatives](#)), the innovation portal of the Ferrovie dello Stato Italiane Group (“FS Group”).

Details on the participation process in the Initiative are provided in the subsequent Articles 3 and 3.1.

3. Participation Rules and Analysis of Proposed Innovative Technical Solutions

At the time of participation, each participating entity must designate a representative, equipped with the necessary powers of representation, who will be the user responsible for the Innovative Technical Solution entered on the *InnoStation* platform, as well as communications with FS SpA. Upon submitting the participation application, simultaneously with the submission of the *submission form* on the *InnoStation* platform, each User will unconditionally accept the contents of this Regulation on behalf of the participating entity they represent. Failure to comply, in whole or in part, with the Regulation will result in exclusion from this Initiative.

Innovative Technical Solutions will not be analyzed:

- a. that have been received after the due date;
- b. containing statements, contributions and/or documents containing partially or totally false and/or incorrect information;
- c. with content that contravenes the rules set out in these Regulations and/or the Terms & Conditions of Use of the FS *InnoStation* website;
- d. violate the intellectual or industrial property rights of third parties;

3.1. How to take part

Participation in the Initiative is free and is formalized through the following two steps:

- a) Creation of a personal account on the FS *InnoStation* website to access the detailed content of the Initiative ([link](#)).
Each User guarantees that the information provided at the time of registration is true and correct. Should FS SpA ascertain that the information provided during the creation of the personal account by the User is not true, it may order the exclusion of the Participating Party and, consequently, of the Innovative Technical Solution proposed by them.
- b) Submission of the requested information through the completion and transmission of the *submission form* (i.e., the participation application). Each user, on behalf of and for the represented participating entity, declares - by accepting the participation and conduct conditions of the Initiative, indicated by marking the checkbox "I confirm" in the *submission form* - to own the ownership or usage rights of any Intellectual Property or industrial proprietary rights related to the proposed Innovative Technical Solution.

3.2. Analysis of proposed solutions

The proposed Innovative Technical Solutions will be analyzed by an internal technical group ("Technical Team") consisting of experts within the companies of the FS Group. The Technical Team will scrutinize the solutions in detail, reserving the right to contact the participating entities that have submitted Innovative Technical Solutions of interest. Ferrovie dello Stato Italiane S.p.A. reserves the right not to contact any participating entity if none of the proposed Innovative Technical Solutions are deemed suitable to meet the needs of FS, as determined by the Technical Team.

4. Limitation of Responsibility

FS SpA assumes no responsibility for any technical malfunctions, *hardware* or *software* issues, network connection interruptions, failed user registrations, registrations that are not correct, accurate, complete, legible, damaged, lost, delayed, not correctly addressed or intercepted, or for user registrations that, for any reason, have not been received, electronic communications, or otherwise, that are delayed, or for other technical problems related to the registration and *upload* of content within the scope of this Initiative.

5. Guarantees, indemnities and responsibilities

Each participating entity guarantees that the content submitted for its participation in the Initiative:

- Does not contain illegal material, prohibited by law, or contrary to what is indicated in this Regulation.
- Does not contain material that violates the rights, positions, or claims of third parties under copyright and industrial property law, as well as other applicable laws or regulations.
- Is freely and legitimately usable in accordance with this Regulation, as the participating entity holds the rights to use them or has obtained availability from all parties entitled to them - having ensured the full compliance and/or satisfaction of the rights, including economic rights, of the authors of the content and/or works from which such content is derived and/or extracted, or of other parties entitled to them, or having fully complied with the obligations due for the use of related rights under the law.

Each user declares, on behalf of and for the participating entity they represent, to be aware of the responsibilities, including criminal ones, incurred in the event of the falseness of the content of the proposed Innovative Technical Solutions and/or in case of falsehood of the statements

regarding the possession of the necessary requirements for participating in the Initiative, hereby indemnifying FS SpA from any possible claims made by third parties in this regard.

6. Confidentiality and Intellectual Property

FS guarantees the confidentiality of information related to the contents of the Innovative Technical Solutions both during the Initiative and after its conclusion.

Every intellectual and industrial property right related to each Innovative Technical Solution will remain the property of the participating entity that submitted it, with FS SpA and the companies controlled or affiliated with the FS Group having the right to access the proposed Innovative Technical Solutions within the Scouting to analyze them for the purposes of the Initiative.

By completing the *submission form*, each user, on behalf of and for the represented participating entity, agrees to the following conditions:

- a. The participating entity must explicitly indicate the intellectual and industrial property rights protecting the proposed Innovative Technical Solution.
- b. The participating entity will independently ensure the protection of the intellectual and industrial property of its Innovative Technical Solution (e.g., through patents, trademarks, copyrights, and registrations) if it deems it appropriate/necessary, without making claims against FS and/or the companies of the FS Group in this regard.

7. Changes to the Initiative Regulation

With the inclusion of its Innovative Technical Solution in the Innostation Platform, each participating entity agrees that FS SpA may make any changes to the Initiative's Regulation at any time. By way of example, such changes may include modifications to the duration, start and/or end of the Initiative, its cancellation, or other specifications of the Initiative itself, except for participation requirements. FS SpA will communicate all changes through the FS *InnoStation* website, specifically in the dedicated space for the Initiative ([link](#)). These changes will become binding upon their publication.

8. Applicable Law and Jurisdiction

This Regulation is governed by Italian law. Any dispute regarding this Regulation (including those concerning its application, interpretation, effectiveness) falls under the exclusive jurisdiction of the Rome Court.

Any future collaborations with foreign entities will be governed by specific agreements, and the respective jurisdiction will be negotiated on a case by case basis.

Any requests for clarification regarding this Regulation can be sent to: openinnovation@fsitaliane.it.

In the event of any discrepancy between the Italian and the translated texts of this Regulation, the Italian text shall prevail and be used to solve doubts of interpretation.