

## ENVIRONMENTAL MANAGEMENT PLAN EMP

Version 5.0, July 5, 2021

*EMP procedures are in detail described in the IF Environment and Social Management Framework (ESMF). Environmental and Social Management Framework specifies environmental and social procedures for implemented projects to adhere to, including Environmental Management Plan, which are consistent with Serbian national legislation and safeguard policies.*

**Project IF ID: 50369**

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### I. MITIGATION PLAN

No.	Phase	Issue	Mitigating Measure	Cost of Mitigation (If Substantial)	Responsibility*	Supervision observation and comments (to be filled out during supervision)
1.	Q1: 1. Establishment of management and communication plan	Q1 – 1. During the establishment of management methods and definition of communication plan no impact on environment is expected. Lack of information,	Albeit no impact on environment is expected throughout Project Q1 activities, a special attention is paid to following: - Implementation of an overall project management system. - Meeting with ISO	None	The Grant recipient	

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<p>2.</p>	<p>2. Provision of equipment for modeling</p>	<p>knowledge and duties regarding environmental protection may result in their exception from the Plan and cause inadequate environmental protection approach in latter project phases.</p> <p>Q1 – 2. During contracting and procurement of Computer-aided Design (CAD) software, PC computers, 3D scanner and 3D printer no impact on environment is expected. Purchased goods would eventually be subject of waste management (and/or circular economy if applicable), yet it is of a very low probability to happen within this project timeframe.</p>	<p>9001 standard requirements (already certified with).</p> <ul style="list-style-type: none"> <li>- Fulfilment of ISO 14001 standard requirements (already certified with).</li> <li>- Integration of the EMP into the Plan.</li> <li>- Complying with the existing Waste Management Plan.</li> <li>- Development of Risk management strategy within the Plan.</li> <li>- Regulatory framework concerning environmental protection and working environment conditions.</li> <li>- Purchased equipment quality certificates, technical and performance specifications, and energy efficiency levels (including products compliance with</li> </ul>			
<p>3.</p>	<p>3. Realization of proof of concept</p>	<p>Q1 – 3. During development of a kinematic model of a pantograph (with the</p>				

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		<p>objective to determine an optimal manpower in the working range) no impact on environment is expected due to the very nature of kinematic modeling. Prolonged realization process may lead to higher consumption of energy.</p>	<p>Directive EU 2009/125/EC on eco-design requirements for energy-related products and Regulation (EU)2017/1369 on energy labelling – where transposed in national legislation).</p> <p>Project team is well informed about environmental protection obligations.</p> <p>With its integrality Plan determines all latter project phases, thus additionally decreases possibility of any notable environmental impact occurrence.</p> <p>Know-how of the consortium team (with recently updated procedure in member R&amp;D department) ensure the proof of concept is obtained in</p>			
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<p>4.</p>	<p>Q2:  1. Designing aerodynamic profile of the structure</p>	<p>Q2 – 1. In the course of designing of the aerodynamic profile of the structure no impact on environment is expected due to the very nature of a designing process, and because aerodynamic profile is predominantly done in a computational mode. Prolonged designing process may lead to higher consumption of energy.</p>	<p>timely manner and fully according to project requirements, and the proof-of-concept deriving rules, hence preventing higher energy consumption.</p> <p>Quality control. Ensuring approvals on Plan and kinematic model by consortium.</p> <p>Applying green designing and engineering to highest possible extent, and according to project innovation concept. Incorporating environmental innovation green postulates - of product design, raw material, production processes, and waste treatment - to highest possible extent, and according to project technology. Time management in</p>	<p>None</p>	<p>The Grant recipient</p>	
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<p>5.</p>	<p>2. Construction of tools</p>	<p>Q2 – 2. During the construction of tools (basic frame, lower frame, upper frame, pantograph sled, integrated pantograph unit, aerodynamic profile production tools and welding tools) and ongoing construction processes where technologies such as - machining, manual processing and assembly, production and impregnation of rolled elements, thermal treatment, sheet metal processing (punching, cutting, bending, drawing, cutting and trimming), welding, painting, tinning and making special tools - are being used, a certain waste amount may be generated.</p> <p>An improper waste management may bring to</p>	<p>order to avoid energy waste.</p> <p>Production process management - Fulfilment of ISO 14001 standard requirements.</p> <p>Full implementation of internal Waste Management Plan. Ensuring systematic collection of waste to avoid scattering and allow proper disposal. Trained personnel on waste management. Proper storage and handling of lubricants, paint and solvents. Final waste disposal according to signed service agreements with licensed operators.</p> <p>Certified equipment. Ensuring proper maintenance of equipment. Strict adherence to</p>	<p>May impose some additional costs (e.g., in case of an equipment failure or a need to reordering or remanufacturing) yet cost of mitigation <i>per se</i> is none or not significant.</p>	<p>The Grant recipient</p>	
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		<p>some impact on environment.</p> <p>Potential, local, limited impact on environment and people from improper maintenance of the equipment.</p> <p>Overuse of resources during manufacturing.</p> <p>Energy waste.</p> <p>Construction process technology such as welding may lead to a risk of sparking.</p> <p>Lower quality, defect or deformations of raw material, production inputs and/or construction tools may cause different potentially negative impact on production/construction process, quality of the planned outputs, safety and health of the workers</p>	<p>established and verified internal procedures.</p> <p>Highly skilled manpower.</p> <p>Smart utilization of used resources (in order to avoid their overexploitation).</p> <p>Energy efficiency measures.</p> <p>Testing of working environment conditions - microclimate - at the production facility, when all technological capacities are in motion, are conducted annually by a licensed laboratory.</p> <p>Ensuring occupational safety measures – implementation of Rulebook on occupational safety and health, and Act on risk assessment at the workplace and in the work environment.</p>			
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		<p>engaged, and environment.</p>	<p>Ensuring fire-protecting measures – implementation of Fire protection rules, and Fire protection training program for employees.</p> <p>Rigorous implementation of the EN 15085 standard - Railway standard:          Welding of railway vehicles and components (already certified with).          Regular quality and safety control of the MIG/MAG welding equipment.          Trained and skilled welders.</p> <p>Internal quality policy implementation.          Quality control (complex and 4-phased) of whole manufacturing process: input control of raw materials, input control of outsourced</p>			
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6.	3. Preparation of 3D Model Pantograph	Q2 – 3. Preparation of Welding Procedure Specification (WPS)	<p>components, intermediate control of subassemblies and operations, and final control of the units.</p> <p>Use of modern Computer Numerical Control (CNC) equipment for gaining accuracy of products and desired quality.</p> <p>Production and construction operations are done following predefined technical specifications for interoperability and internal working protocols in a facility equipped exclusively for the production of pantographs.</p> <p>Environmental monitoring.</p> <p>3D Model Pantograph is developed and prepared fully</p>	None	The Grant recipient	
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		<p>books/list, technical documentation, Bill of Materials (BOM), Processing technology, and Quality control list, as well as Computer Numerical Control (CNC) programing and purchase of material for prototype are expected to have no impact on environment due to the very nature of these activities.</p> <p>Prolonged preparation process may lead to higher consumption of resources and energy.</p>	<p>according to EN 50206-1 (Railway applications, Rolling Stock, Pantographs: Characteristics and tests – Part 1: Pantographs for main line vehicles) and EN 50367 (Railway applications, Fixed installations – Criteria to achieve technical compatibility between pantographs and overhead contact line) standards.</p> <p>Ensuring energy efficiency during the preparation of processing technology. Ensuring resources smart-utilization management.</p> <p>All information on purchased materials for prototype will be obtained from the producer(s).</p>			
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	<p><b>Q3:</b></p> <p>1. Calculations of aerodynamic forces</p>	<p>During calculations of aerodynamic forces, no impact on environment is expected due to the nature of a process of performing calculations.</p>	<p>Whenever possible, purchase will target more environmentally friendly material or product.</p> <p>Wherever possible, all listing preparation work will be done electronically, i.e., virtually, saving paper as much as possible.</p> <p>Quality control.</p> <p>Ensuring strict adherence to project design and components interoperability.</p>	<p>None</p>	<p>The Grant recipient</p>	
<p>7.</p>	<p>2. Construction of Air Wings</p>	<p>Construction of air wings may provoke a certain amount of waste. An improper waste management may bring to some impact on environment.</p>	<p>Construction is done with certified equipment and tools, by skilled professionals specially trained for the project, and at indoor facility.</p> <p>Waste management.</p>	<p>May impose some additional costs (e.g., in case of an equipment failure or a need to reordering or reconstructing) yet cost of mitigation <i>per se</i> is none or not</p>	<p>The Grant recipient</p>	
<p>8.</p>						

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<p>9.</p>	<p>Q4: 1. Production of the first pantograph prototype</p>	<p>Potential, local, limited impact on environment and people from improper maintenance of the equipment.</p> <p>Overuse of resources and energy during construction.</p> <p>Potentially negative impact on construction process, quality of the planned outputs, safety and health of the workers engaged, and environment due to lower quality, defect or deformations of raw material, production inputs and/or construction tools.</p> <p>Q4 – 1. During the production of the first pantograph prototype, a certain waste amount may occur.</p> <p>Construction process technology such as</p>	<p>Smart utilization of used resources. Energy efficiency measures.</p> <p>Ensuring occupational safety measures and fire-protecting measures.</p> <p>Quality control - ensuring approvals are obtained by all consortium members. Quality system policy of Project Q3 activities competent consortium member (Faculty and its Innovation Center).</p> <p>In due with pantograph usual mode production technological process and the Project design, applied measures are as in Q2 - 2, including: - Management and communication plan implementation.</p>	<p>significant.</p> <p>May impose some additional costs (e.g., in case of an equipment failure or a need to reproduction) yet cost of mitigation <i>per se</i> is none or not significant.</p>	<p>The Grant recipient</p>	
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		<p>welding may lead to a risk of sparking.</p> <p>Overuse of resources and energy during production process.</p>	<ul style="list-style-type: none"> <li>- EN 15085 standard implementation.</li> <li>- Use of modern Computer Numerical Control equipment.</li> <li>- Resources sustainability management.</li> <li>- Full implementation of internal Waste Management Plan.</li> <li>- Rigorous quality control procedure.</li> <li>- Environmental monitoring.</li> </ul> <p>Production is done in the facility intended and equipped (certified equipment) exclusively for the production of pantographs with perennial production of pantographs.</p> <p>Testing of working environment conditions</p> <ul style="list-style-type: none"> <li>- microclimate - at the production facility,</li> <li>when all technological</li> </ul>			
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<p><b>10.</b></p>	<p>2. Aero tunnel testing of the first pantograph prototype</p>	<p>Q4 – 2. During the aero tunnel testing of the first pantograph prototype no impact on environment is expected due to aero tunnel testing characteristics. Prolonged testing may lead to higher consumption of energy.</p>	<p>capacities are in motion, are conducted annually by a licensed laboratory.</p> <p>Certified equipment.</p> <p>Smart innovation management – avoiding unnecessary and excessive testing thus save energy and other resources.</p> <p>Testing is performed indoor, in a specialized facility, with no impact on external environment.</p>	<p>None</p>	<p>The Grant recipient</p>	
<p><b>11.</b></p>	<p><b>Q5 – Q6:          Revisions</b></p>	<p>During revisions of the prototype aero testing no impact on environment is expected. Prolonged revisions may lead to higher consumption of resources and energy.</p>	<p>Using adequate equipment and tools for revision measurement and evaluation processes.</p> <p>Smart innovation management – avoiding unnecessary and excessive revisions, hence saving energy</p>	<p>None</p>	<p>The Grant recipient</p>	

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			<p>and other resources.</p> <p>Ensure involvement and approval of all consortium members.</p>			
12.	<p><b>Q7.</b></p> <p>1. Development of the simulation model.</p> <p>2. Simulation of the pantograph prototype behavior</p>	<p>During development of the simulation model and the prototype behavior simulation conducting no new impact on environment is expected.</p> <p>Prolonged simulation process may lead to higher consumption of resources and energy.</p>	<p>Simulation model is environmentally friendly.</p> <p>Simulation of the prototype behavior is done in a specialized, properly prepared and equipped surrounding.</p> <p>Ensure application of all safety and health protocols – implementation of internal documents.</p> <p>Constant professional surveillance.</p> <p>Quality control</p>	None	The Grant recipient	

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<p>13.</p>	<p>Q8.</p> <p>1. Production of the first high reach pantograph for high speed</p>	<p>Q8 - 1. During the production of the first high reach pantograph for high speed, a certain waste amount may be generated.</p> <p>Potential impact on environment is due to improper maintenance of equipment.</p> <p>Overuse of resources and energy during manufacturing.</p> <p>Construction process technology such as welding may lead to a risk of sparking.</p> <p>Lower quality, defect or</p>	<p>approach.</p> <p>Smart innovation management – avoiding unnecessary and excessive simulations, to save energy and other resources.</p> <p>Management and communication plan. Production plan. Production is done in the facility intended and equipped exclusively for the production of pantographs. Deep expertise of the engaged project team.</p> <p>ISO 9001, ISO 14001, EN 15085 standards implementation.</p> <p>Use of modern Computer Numerical Control equipment.</p> <p>Production and construction operations</p>	<p>May impose some additional costs (e.g., in case of an equipment failure or a need to reordering or reproduction) yet cost of mitigation <i>per se</i> is none or not significant.</p>	<p>The Grant recipient</p>	
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		<p>deformations of raw material, production inputs and/or construction tools may cause different potentially negative impact on production/construction process, quality of the planned outputs, safety and health of the workers engaged, and environment.</p>	<p>are done following clear internal working protocols all personnel is familiar with.</p> <p>Full implementation of internal Waste Management Plan. Final waste disposal according to signed service agreements with licensed operators.</p> <p>Smart utilization of used resources (in order to avoid their overexploitation). Energy efficiency measures.</p> <p>Ensuring occupational safety measures. Ensuring fire-protecting measures.</p> <p>Rigorous final product quality control.</p> <p>Environmental monitoring.</p>			
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14.	2. Preparation of the final documentation	Q8 - 2. During preparation of the final documentation no impact on environment is expected.	Final documentation is prepared according to the recognized innovation project management and international standards. Avoiding unnecessary paper cost.	None	The Grant recipient	
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\*Items indicated to be the responsibility of the contractor shall be specified in the bid documents

## II. MONITORING PLAN

No.	Phase	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored/ type of monitoring equipment?	When is the parameter to be monitored- frequency of measurement or continuous?	Monitoring Cost What is the cost of equipment or contractor charges to perform monitoring?	Responsibility	Supervision observation and comments (to be filled out during supervision with reference to adequate measuring reports)
1.	Q1. 1. Establishment of management and communication plan	Quality (green agenda, content, coverage, feasibility, etc.) of the Plan. Compliance with other relevant plans	In the process of the Plan drafting, and in the Plan.	Through Plan green agenda check list that will be prepared by consortium members prior to the Plan drafting.	Throughout the Plan drafting process, and once the Plan is established.	None	The Grant recipient	

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		and standards, and regulatory framework.						
	2. Provision of equipment for modeling	<p>Familiarity of the project team with environmental protection matters.</p> <p>Quality of the purchased equipment.</p> <p>Ordering, delivery and accompanying logistics management related to act of purchase of equipment.</p>	Through certifications and technical specifications of the equipment.	Through receiving and keeping all certifications and technical specifications of the equipment.	Prior to procurement, and during the provision process.	None	The Grant recipient	
	3. Realization of proof of concept	Objectives of the proof-of-concept realization approach and methodology.	Through the proof-of-concept realization process.	Through realization check list (namely Proof of concept success	Throughout the model development process.	None	The Grant recipient	

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<p>2.</p>	<p><b>Q2:</b></p> <p>1. Designing aerodynamic profile of the structure</p>	<p>Quality (level of needed qualitative and quantitative data provision) of developed kinematic model of a pantograph.</p> <p>Quality of the structure aerodynamic profile design.</p>	<p>In the structure aerodynamic profile design process.</p>	<p>criteria list) that will be prepared by consortium members prior to the development of pantograph kinematic model.</p> <p>Reporting to management.</p> <p>Through realization and quality check lists that will be prepared by consortium members prior to the structure aerodynamic profile design.</p> <p>Reporting to management.</p>	<p>Throughout the structure aerodynamic profile design process.</p>	<p>None</p>	<p>The Grant recipient</p>	
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	2. Construction of tools	<p>Quality of the constructed tools:          Quantity          Dimension          Tolerance          Completeness          Functionality          Interoperability          Static contact force          Finishing          (All relative to the project predefined design, drawings, models and profiles).</p> <p>Construction plan fulfilment.</p> <p>EN 15085 standard implementation.</p> <p>Waste</p>	<p>Across the process of tools construction.</p> <p>On the project</p>	<p>Through quality check list that will be prepared by the consortium members prior to construction of tools (Basis for quality check list are ISO 14001 requirements, EN 15085 standard requirements, technical specifications, measurement lists, and test lists).</p> <p>Internal work orders and reporting to management.</p> <p>Through</p>	<p>Prior to, during and after the completion of the process of tools construction.</p> <p>During construction</p>	<p>None</p> <p>Non-significant in</p>	<p>The Grant recipient</p> <p>Contractor (optional)</p>	
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		temporary storage processes and quantities estimation of generated waste.	site. Temporary storage of the facility.	checklist for environmental compliance audit.  Waste management plan. Visual monitoring. Keeping records in accordance with regulations.	process.  Continuously, daily.	case outsourced.		
	3. Preparation of 3D Model Pantograph	Level (quality and quantity) of preparation for 3D modelling.	In 3D Model Pantograph preparation process.	Technical documentation book.  Financial data (input and output invoices).  Processing technology preparation and CNC programing	Prior to and during the 3D Model Pantograph preparation.	None	The Grant recipient	

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<p><b>3.</b></p>	<p><b>Q3.</b></p> <p>1. Calculations of aerodynamic forces</p> <p>2. Construction of Air Wings</p>	<p>Quality of the constructed air wings:          Quantity          Dimension          Tolerance          Completeness          Functionality          Interoperability          Static contact force          Finishing          (All relative to the project predefined design,</p>	<p>Across the process of air wings construction.</p>	<p>protocols.</p> <p>Quality control list.</p> <p>Internal work orders and reporting to management.</p> <p>Through quality check list that will be prepared by the consortium members prior to construction of air wings.</p> <p>Internal work orders and reporting to management.</p>	<p>Prior to, during and after the completion of the process of air wings construction.</p>	<p>None</p>	<p>The Grant recipient</p>	
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<p><b>4.</b></p>	<p><b>Q4.</b></p> <p>1. Production of the first pantograph prototype</p>	<p>drawings, models and profiles). Construction plan fulfilment.</p> <p>Waste temporary storage processes and quantities estimation of the generated waste.</p> <p>Quality of the produced pantograph prototype:          Dimension          Tolerance          Completeness          Functionality          Interoperability          Static contact force          Finishing          (All relative to the project predefined</p>	<p>On the project site. Temporary storage of the facility.</p> <p>Across the process of pantograph prototype production.</p>	<p>Through checklist for environmental compliance audit.</p> <p>Waste management. Visual monitoring. Keeping records.</p> <p>Through quality check list that will be prepared by the consortium members prior to production of pantograph prototype (Basis for quality check list are ISO 14001</p>	<p>During construction process.</p> <p>Continuously, daily.</p> <p>Prior to, during and after the completion of the process of pantograph prototype production.</p>	<p>Non-significant in case outsourced.</p> <p>None</p>	<p>Contractor (optional)</p> <p>The Grant recipient</p>	
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## COLLABORATIVE GRANT SCHEME Program

		<p>design, drawings, models and profiles).</p> <p>Production plan fulfilment.</p> <p>EN 15085 standard implementation</p>		<p>requirements, EN 15085 standard requirements, technical specifications, measurement lists, and test lists).</p> <p>Internal work orders and reporting to management.</p> <p>Through checklist for environmental compliance audit</p>	<p>During the production.</p>	<p>Non-significant in case outsourced.</p>	<p>Contractor (optional)</p>	
		<p>Waste temporary storage processes and quantities estimation of the generated waste.</p>	<p>On the project site. Temporary storage of the facility.</p>	<p>Waste management plan. Visual monitoring. Keeping records in accordance with</p>	<p>Continuously, daily.</p>			



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	2. Aero tunnel testing of the first pantograph prototype	Prototype performance.	In a process of aero tunnel testing.	regulations. Through predefined and prepared performance check list.	During the testing.	None	The Grant recipient	
5.	<b>Q7.</b> 1. Development of the simulation model. 2. Simulation of the pantograph prototype behavior	Prototype performance.	In a process of prototype behavior simulation.	Through performance check list. Through checklist for environmental compliance audit. Reporting to management.	During the simulation process.	None Non-significant in case outsourced.	The Grant recipient Contractor (optional)	
6.	1. Production of	Quality of the	Across the	Through	Prior to, during and	None	The Grant recipient	

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	<p>the first high reach pantograph for high speed</p>	<p>produced high reach pantograph for high speed:            Dimension            Tolerance            Completeness            Functionality            Interoperability            Static contact force            Finishing            (According to the predefined production design requirements).</p> <p>Production plan fulfilment.</p> <p>EN 15085 standard implementation.</p> <p>Waste temporary storage processes and quantities</p>	<p>process of the production of the first high reach pantograph for high speed.</p> <p>On the project site.            Temporary storage of the facility.</p>	<p>quality check list that will be prepared by the consortium members prior to production (List basis: management and production plans).</p> <p>Internal work orders and reporting to management.</p> <p>Through checklist for environmental compliance audit.</p> <p>Waste management plan.            Visual monitoring.</p>	<p>after the completion of the process of production of high reach pantograph for high speed.</p> <p>During the production process.</p> <p>Continuously, daily.</p>	<p>Non-significant in case outsourced.</p>	<p>Contractor (optional)</p>	
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		estimation (keeping daily records) of the generated waste.		Keeping records in accordance with regulations.				
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### III. PUBLIC CONSULTATION DETAILS AND MINUTES OF MEETING FOR THE ENVIRONMENTAL MANAGEMENT PLAN

In a separate document provide details on:

1. Manner in which notification of the consultation was announced: media(s) used, date(s), description or copy of the announcement
2. Date(s) consultation(s) was (were) held
3. Location(s) consultation(s) was (were) held
4. Who was specifically invited (Name, Organization or Occupation, Telephone/Fax/e-mail number/address (home and/or office)?)
5. List of Attendees (Name, organization or occupation, contact details)
6. Meeting Agenda
7. Summary Meeting Minutes (Comments, Questions and Response by Presenters)
8. List of decisions reached, and any actions agreed upon with schedules and deadlines and responsibilities.

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### ***INTERNAL USE:***

Form checked and reviewed by the Innovation Fund: External environmental and social management provider (ESMP)	
Date	
Name	
Title	
Signature	

### III. PUBLIC CONSULTATION DETAILS AND MINUTES OF MEETING FOR THE ENVIRONMENTAL MANAGEMENT PLAN

#### 1. Manner in which notification of the consultation was announced

Notification of the Public consultation appeared on MINEL GENERAL ELECTRIC company official site on January 25<sup>th</sup>, 2022. The announcement briefly informed public about the project and called for comments, suggestions and questions regarding Environmental Management Plan *via* the given e-mail address.

The announcement is available at:

<http://www.minelge.rs/wp-content/uploads/2022/01/text.pdf>

The EMP Draft version was accessible to the general public for review and comments from January 25<sup>th</sup> till January 31<sup>st</sup>, 2022.

<http://www.minelge.rs/wp-content/uploads/2022/01/CGS-EMP-5.0-MINEL-GE-DRAFT-no.1-2.pdf>

A number of relevant stakeholders were specifically invited with a notification and Draft EMP enclosed:

Professional public – professors at the Faculty of Mechanical Engineering in Belgrade:

Snežana Kirin [snezanakirin@yahoo.com](mailto:snezanakirin@yahoo.com)

Nenad Mitrović [nenadmitrovic156@gmail.com](mailto:nenadmitrovic156@gmail.com)

Mihajlo Arandžević [mixaylo23@gmail.com](mailto:mixaylo23@gmail.com)

Branislav Đorđević [b.djordjevic88@gmail.com](mailto:b.djordjevic88@gmail.com)

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Customers: Elok Centar [elokcentar@gmail.com](mailto:elokcentar@gmail.com) , Elektroremont [nabavka@elektroremont.co.rs](mailto:nabavka@elektroremont.co.rs)

Suppliers: Rajan [nikola@rajan.rs](mailto:nikola@rajan.rs) , Metal Centar [milan@metal-centar.rs](mailto:milan@metal-centar.rs)

Local community of Vojka, municipality of Stara Pazova (location of our production facility):

[Mz.vojka@mts.rs](mailto:Mz.vojka@mts.rs)

A number of independent environmental consulting practitioners were directly informed, as well.

#### 2. Date(s) consultation(s) was (were) held

The Grant recipient internal meeting regarding EMP Draft Public consultation, in a hybrid mode (in vivo and *via* Zoom) due to pandemic measures, was held on January 31<sup>st</sup>, 2022.

#### 3. Location(s) consultation(s) was (were) held

The Grant recipient meeting on EMP Draft Public consultation was held at the offices of MINEL GENERAL ELECTRIC company in Vojka.

#### 4. List of Attendees (Name, organization or occupation, e-mail address)

Snežana Kirin, Faculty of Mechanical Engineering, [snezanakirin@yahoo.com](mailto:snezanakirin@yahoo.com)

Nenad Mitrović, Faculty of Mechanical Engineering, [nenadmitrovic156@gmail.com](mailto:nenadmitrovic156@gmail.com)

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Dušan Matić, Minel General Electric, [dusan.matic@minelge.rs](mailto:dusan.matic@minelge.rs)

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#### 5. Meeting Agenda

- Brief explanation of the overall environmental management framework and Environmental Management Plan (EMP) subject and purpose.
- Presentation of the EMP Draft for the Project marked IF ID 50369 at the Innovation Fund.
- Discussion on the EMP Draft: comments, questions, responses, clarifications.
- Approval of the EMP Draft.
- Informing about the next steps regarding the EMP.

#### 6. Summary of Meeting Minutes and decisions reached

At the beginning of the meeting the participants got acquainted with the overall environmental management framework and Environmental Management Plan (EMP) subject and purpose. It was said that EMP is the key management tool and leading environmental management document related to environmental performance of a business, production, construction, project or some other work. EMP is an integral part of the business, project, or technical documentation. EMP provides a strategic framework for managing potential environmental impacts associated with the business, production, construction, project, etc., and defines the procedures to be implemented by the (legal) entity that bear the responsibility for the determined business, production, construction, project activity. EMP strictly follows and is in accordance with the business, project, or technical documentation (main design or technology), is usually based on the list of predicted impacts which has been used to define mitigation measures at Environmental Impact Assessment (EIA) Study, with request to be implemented to mitigate potential impacts, and commonly contains:

- Mitigation Plan: Parameters on the basis of which it is possible to determine the harmful effects on the environment (parameters to be followed, and on the basis of which harmful effects can be determined, are determined on the basis of the state of the environment, identification and quantification of specific pollution sources).
- Monitoring Plan: Places, method and frequency of measurement of the established parameters (Determination of the location, method and frequency of measurement of the determined parameters is carried out in accordance with the required norms and standards).

Next, the presentation of the EMP Draft for the Project marked IF ID 50369 at the Innovation Fund was made. It was stated that the Project EMP Draft was prepared fully based on the following sources:

- Pantograph production known technology,
- Submitted Project Business Plan, and
- Filled Project Environmental Screening Questionnaire (ESQ).

It was emphasized that due to the project innovation nature, the Project EMP Draft addresses only planned milestones of the project quarters as given in the Business Plan presented within the Innovation Fund Collaborative Grant Scheme Program public call.

Therefore, the consortium team (the Grant recipient) ascertains that an update and upgrade of the Project EMP is possible prior to or/and during the project implementation timeframe under the influence of

further professional supervision process, consultations with stakeholders or project affected persons, or due to assessment of mitigation measures' effectiveness.

Continuing, responses and clarifications were provided to several comments and questions received during the public consultation process.

> Why other environmental factors, such as wastewater, air emissions, soil contamination, noise are not elaborated in the Project EMP Draft?

Clarification: Because of the fact that it was estimated by the project team that the project activities would not generate these types of impact on environment. As designed the project activities regarding construction and production phases are predominantly the same as the activities that represent part of the primary activities range of the pantograph production process of the Applicant (The Grant recipient) within its production facility, and from the experience we learn that these activities do not generate wastewater nor air emissions or noise that would require control (mitigation and monitoring) measures.

> Do you expect cumulative impact? Answer: No.

> How do you plan to operate resources management?

Answer: Smart (efficient) resources management is at the core of our railway pantograph and different electromechanical components production processes. Upon perennial praxis, we have established manufacturing procedures that are result of our research and technological development and are based on resources efficiency. Moreover, our rigorous multi-phased quality control does not allow material or energy waste.

> What EMP Draft mitigation measure you value as the most prominent one?

Answer: Full and continual implementation of various standards we are already certified with (to mention just few: EN 15085, ISO 14001, ISO 9001) could be seen as one of the most promising tools in preventing any negative impact on environment.

> Monitoring is significantly based on checking lists. Please explain.

Clarification: In our case, checking lists are proven mean of whole production process quality monitoring. Thus, we consider checking list an effective manner of holistic environmental monitoring.

> What type of waste will be mostly generated?

Answer: Technologies applied in railway pantograph production mostly generate wastes from cutting and preparation of parts (sawdust - metal shavings), waste worn electrodes and waste slag. Also, packaging waste (paper, cardboard, plastic, metal, wood), waste absorbents, filter materials and protective clothing, electronic and electrical waste, waste fluo pipes could be generated.

> What is ensured by implementing EN 15085 standard?

Clarification: EN 15085 standard covers quality requirements and assessments of welding manufacturers, design requirements, production requirements, inspection, testing and documentation. Compliance with this standard means having qualified resources and capabilities to perform at the highest quality level, comprehensively ensuring safety of people, environment and equipment operation.

This is one of the reasons for having such relations between environmental protection, work-force safety and production process quality in the project EMP Draft.

After the discussion, the EMP Draft was unanimously approved.

The meeting attendees were informed that the Project EMP Draft will be assessed by independent environmental management expert before submitting it to the Innovation Fund.