

## Realisation stage I - Project *SMESEE PROD CHE system*

### I. Raportare livrabile

Stage 1 - 01.08.2021 - 30.11.2021					
Activity 1. Development of experimental model of <i>SMESEE PROD CHE system / Part 1</i>					
(Elaboration, realization and experimentation of the <i>experimental model</i> of the system -- <i>SMESEE PROD CHE system</i> )					
Interim report –RI 1					
Nr. crt	Conținut	Documente de finalizare /conținut	Realizare livrabile	Realizare activitati	
1	<b><i>A1.1. Elaboration, realization and experimentation of the experimental model of the subsystem for monitoring, analysis and diagnosis of the hydro aggregate for electricity production – SS1-hydro aggregate subsystem.</i></b>	<b><i>Experimental model of the subsystem for monitoring, analysis and diagnosis of the hydro aggregate for electricity production – SS1-hydro aggregate subsystem.</i></b>			
	A1.1.1. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for on-line monitoring and diagnosis of hydrogenerator cooling and lubrication oil – <b><i>M1.1. hydrogenerator oil module</i></b>	1. Documentation report regarding the definitions of the functions and structure of module <b><i>M1.1. hydrogenerator oil module</i></b> 2. Project of the experimental model of the module <b><i>M1.1. hydrogenerator oil module</i></b> 3. Experimental model of the module <b><i>M1.1. hydrogenerator oil module</i></b>	X  X  X (partial)		
	A1.1.2. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for on-line monitoring and diagnosis of hydrogenerator stators condition – <b><i>M1.2. generator stator module</i></b>	1. Documentation report regarding the definitions of the functions and structure of module <b><i>M1.2. generator stator module</i></b> 2. Project of the experimental model of the module <b><i>M1.2. generator stator module</i></b> 3. Experimental model of the module <b><i>M1.2. generator stator module</i></b>	X  X  ---		
	A1.1.3. Elaboration, realization and experimentation	1. Documentation report regarding the	X		

	of the <i>experimental model</i> of the module for on-line monitoring and diagnosis of hydrogenerator rotors – <b>M1.3. generator rotor module</b>	definitions of the functions and structure of module <b>M1.3. generator rotor module</b> 2. Project of the experimental model of the module <b>M1.3. generator rotor module</b> 3. Experimental model of the module <b>M1.3. generator rotor module</b>	X ---		
	A1.1.4. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for the analysis of the partial discharges of hydrogenerator windings – <b>M1.4. generator partial discharges module</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M1.4. generator partial discharges module</b> 2. Project of the experimental model of the module <b>M1.4. generator partial discharges module</b> 3. Experimental model of the module <b>M1.4. generator partial discharges module</b>	X X ---		
	A1.1.5. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for on-line monitoring and diagnosis of hydrogenerators sub-assemblies' vibrations – <b>M1.5. Generator vibration modul</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>Generator vibration module</b> 2. Project of the experimental model of the module <b>Generator vibration module</b> 3. Experimental model of the module <b>M1.5. Generator vibration module</b>	X X ---		
	A1.1.6. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for the analysis of hydrogenerator bearings – <b>M1.6. Generator bearings analysis module</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M1.6. Generator bearings analysis module</b> 2. Project of the experimental model of the module <b>M1.6. Generator bearings analysis module</b> 3. Experimental model of the module <b>M1.6. Generator bearings analysis</b>	X X ---		

		<i>module</i>			
	A1.1.7. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for the analysis of the turbine drive of hydrogenerators – <b>M1.7. Turbine analysis module..</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M1.7. Turbine analysis module</b> 2. Project of the experimental model of the module <b>M1.7. Turbine analysis module</b> 3. Experimental model of the module <b>M1.7. Turbine analysis module</b>	X  X ---		
	A1.1.8. Elaboration, realization and experimentation of the experimental model of the module for on-line monitoring and diagnosis of the directing device of hydrogenerators- <b>M1.8. wicket gates module</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M1.8. wicket gates module</b> 2. Project of the experimental model of the module <b>M1.8. wicket gates module</b> 3. Experimental model of the module <b>M1.8. wicket gates module</b>	X  X ---		
	A1.1.9. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for on-line monitoring and diagnosis of the cooling system of hydrogenerators – <b>M1.9. generator cooling-ventilation system module.</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M1.9. generator cooling-ventilation system module</b> 2. Project of the experimental model of the module <b>M1.9. generator cooling-ventilation system module</b> 3. Experimental model of the module <b>M1.9. generator cooling-ventilation system module</b>	X  X ---		
	A1.1.10. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for on-line monitoring and diagnosis of the fire extinguishing installation of hydrogenerators – <b>M1.10. generator fire extinguisher module.</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M1.10. generator fire extinguisher module</b> 2. Project of the experimental model of the module <b>M1.10. generator fire extinguisher module</b>	X  X ---		

		<p>3. Experimental model of the module <b><i>M1.10. generator fire extinguisher module</i></b></p> <p>4. Test report of the experimental model of the module <b><i>M1.10. generator fire extinguisher module</i></b></p>			
	<p>A1.1.11. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for the acquisition, storage and transmission of hydrogenerator monitoring data – <b><i>M1.11. generator data acquisition module</i></b></p>	<p>1. Documentation report regarding the definitions of the functions and structure of module <b><i>M1.11. generator data acquisition module</i></b></p> <p>2. Project of the experimental model of the module <b><i>M1.11. generator data acquisition module</i></b></p> <p>3. Experimental model of the module <b><i>M1.11. generator data acquisition module</i></b></p>	<p>X</p> <p>X</p> <p>---</p>		
	<p>A1.1.12. Elaboration, realization and experimentation of the <i>model</i> of multicriteria analysis of the technical condition of the subassemblies of hydrogenerators – <b><i>M1.12. generator status analysis module</i></b></p>	<p>1. Documentation report regarding the definitions of the functions and structure of module <b><i>M1.12. generator status analysis module</i></b></p> <p>2. Project of the experimental model of the module <b><i>M1.12. generator status analysis module</i></b></p> <p>3. Experimental model of the module <b><i>M1.12. generator status analysis module</i></b></p>	<p>X</p> <p>X</p> <p>---</p>		
	<p>A1.1.13. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for determining the consumed and remaining lifetimes of hydrogenerators – <b><i>M1.13. Generator lifetime module.</i></b></p>	<p>1. Documentation report regarding the definitions of the functions and structure of module <b><i>M1.13. Generator lifetime module</i></b></p> <p>2. Project of the experimental model of the module <b><i>M1.13. Generator lifetime module</i></b></p> <p>3. Experimental model of the module</p>	<p>X</p> <p>X</p> <p>---</p>		

		<b>M1.13. Generator lifetime module</b>			
2	<b>A1.2. Elaboration, realization and experimentation of the experimental model of the subsystem for monitoring, analysis and diagnosis of power transformers of the HPP – SS2. Power plant transformer subsystem.</b>	<b>Experimental model of the subsystem for monitoring, analysis and diagnosis of power transformers of the HPP – SS2. Power plant transformer subsystem</b>			
	A1.2.1. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for on-line monitoring and diagnosis of power transformer terminals – <b>M2.1 transformer terminals module.</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M2.1 transformer terminals module</b> 2. Project of the experimental model of the module <b>M2.1 transformer terminals module</b> 3. Experimental model of the module <b>M2.1 transformer terminals module</b>	X  X ---		
	A1.2.2. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for monitoring the noise and vibrations of power transformers – <b>M2.2. Transformer vibration module.</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M2.2. Transformer vibration module</b> 2. Project of the experimental model of the module <b>M2.2. Transformer vibration module</b> 3. Experimental model of the module <b>M2.2. Transformer vibration module</b>	X  X ---		
	A1.2.3. Development, realization and experimentation of the <i>experimental model</i> of the module for the analysis of partial discharges of power transformers – <b>M2.3. Transformer the partial discharges module.</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M2.3. Transformer the partial discharges module</b> 2. Project of the experimental model of the module <b>M2.3. Transformer the partial discharges module</b> 3. Experimental model of the module <b>M2.3. Transformer the partial discharges module</b>	X  X ---		

	<p>A1.2.4. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for temperature analysis along the windings of power transformers – <b>M2.4. transformer windings heating module</b></p>	<p>1. Documentation report regarding the definitions of the functions and structure of module <b>M2.4. transformer windings heating module</b>  2. Project of the experimental model of the module <b>M2.4. transformer windings heating module</b>  3. Experimental model of the module <b>M2.4. transformer windings heating module</b></p>	<p>X  X ---</p>		
	<p>A1.2.5. Elaboration, realization and experimentation of the experimental model of the module for on-line monitoring and diagnosis of the cooling system of power transformers – <b>M2.5. Transformer cooling module.</b></p>	<p>1. Documentation report regarding the definitions of the functions and structure of module <b>M2.5. Transformer cooling module</b>  2. Project of the experimental model of the module <b>M2.5. Transformer cooling module</b>  3. Experimental model of the module <b>M2.5. Transformer cooling module</b></p>	<p>X  X ---</p>		
	<p>A1.2.6. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for on-line monitoring and diagnosis of the fire extinguishing installation of power transformers – <b>M2.6. Transformer fire extinguishing module</b></p>	<p>1. Documentation report regarding the definitions of the functions and structure of module <b>M2.6. Transformer fire extinguishing module</b>  2. Project of the experimental model of the module <b>M2.6. Transformer fire extinguishing module</b>  3. Experimental model of the module <b>M2.6. Transformer fire extinguishing module</b></p>	<p>X  X ---</p>		

	A1.2.7. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for the acquisition, storage and transmission of monitoring data of power transformers – <b>M2.7. Transformer data acquisition module</b>	<p>1. Documentation report regarding the definitions of the functions and structure of module <b>M2.7. Transformer data acquisition module</b></p> <p>2. Project of the experimental model of the module <b>M2.7. Transformer data acquisition module</b></p> <p>3. Experimental model of the module <b>M2.7. Transformer data acquisition module</b></p>	X		
	A1.2.8. Elaboration, realization and experimentation of the <i>model</i> for the multicriteria analysis of the technical condition of transformer subassemblies – <b>M2.8.transformer status analysis module.</b>	<p>1. Documentation report regarding the definitions of the functions and structure of module <b>M2.8.transformer status analysis module</b></p> <p>2. Project of the experimental model of the module <b>M2.8.transformer status analysis module</b></p> <p>3. Experimental model of the module <b>M2.8.transformer status analysis module</b></p>	X		
	A1.2.9. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for estimating the consumed and remaining lifetimes of power transformers – <b>M2.9.transformer lifetime module</b>	<p>1. Documentation report regarding the definitions of the functions and structure of module <b>M2.9.transformer lifetime module</b></p> <p>2. Project of the experimental model of the module <b>M2.9.transformer lifetime module</b></p> <p>3. Experimental model of the module <b>M2.9.transformer lifetime module</b></p>	X		
3	<b>A1.3. Elaboration, realization and experimentation of the experimental model of the subsystem for monitoring, analysis and diagnosis of underground power lines (cable lines) – SS3 underground line subsystem</b>	<b>Experimental model of the subsystem for monitoring, analysis and diagnosis of underground power lines (cable lines) – SS3 underground line subsystem</b>	X		

	A1.3.1. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for the analysis of the partial discharges of the power lines in cable – <b>M3.1. line partial discharges module.</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M3.1. line partial discharges module</b> 2. Project of the experimental model of the module <b>M3.1. line partial discharges module</b> 3. Experimental model of the module <b>M3.1. line partial discharges module</b>	X  X ---		
	A1.3.2. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for the analysis of the absorption-resorption currents of the power lines in cable – <b>M3.2. CABS line module.</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M3.2. line CABS module</b> 2. Project of the experimental model of the module <b>M3.2. line CABS module</b> 3. Experimental model of the module <b>M3.2. line CABS module</b>	X  X ---		
	A1.3.3. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for temperature analysis on the length of the cables of the power lines in cable – <b>M3.3. line heating module</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M3.3. line heating module</b> 2. Project of the experimental model of the module <b>M3.3. line heating module</b> 3. Experimental model of the module <b>M3.3. line heating module</b>	X  X ---		
	A1.3.4. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for the acquisition, storage and transmission of monitoring data of power lines in cable – <b>M3.4. line data acquisition module.</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M3.4. line data acquisition module</b> 2. Project of the experimental model of the module <b>M3.4. line data acquisition module</b> 3. Experimental model of the module <b>M3.4. line data acquisition module</b>	X  X ---		
	A1.3.5. Elaboration, realization and experimentation of the <i>model</i> for the multicriteria analysis of the	1. Documentation report regarding the definitions of the functions and structure	X		

	technical condition of electric cables – <b>M3.5. Line condition analysis module</b>	of module <b>M3.5. line condition analysis module</b> 2. Project of the experimental model of the module <b>M3.5. line condition analysis module</b> 3. Experimental model of the module <b>M3.5. line condition analysis module</b>	X ---		
	A1.3.6. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for estimating the consumed and remaining lifetimes of the power lines in cable – <b>M3.6.line lifetime module.</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M3.6.line lifetime module</b> 2. Project of the experimental model of the module <b>M3.6.line lifetime module</b> 3. Experimental model of the module <b>M3.6.line lifetime module</b>	X X ---		
4	<b>A1.4. Elaboration, realization and experimentation of the experimental model of the subsystem for monitoring, analysis and diagnosis of medium voltage power circuit breakers – SS4 circuit breaker subsystem.</b>	<b>Experimental model of the subsystem for monitoring, analysis and diagnosis of medium voltage power circuit breakers – SS4 circuit breaker subsystem</b>			
	A1.4.1. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for the analysis of the actuation times of medium voltage power circuit breakers – <b>M4.1 circuit breaker actuation time module.</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M4.1 circuit breaker actuation time module</b> 2. Project of the experimental model of the module <b>M4.1 circuit breaker actuation time module</b> 3. Experimental model of the module <b>M4.1 circuit breaker actuation time module</b>	X X ---		
	A1.4.2. Elaboration, realization and experimentation of the experimental model of the module for the analysis of the short circuit currents of medium voltage power circuit breakers – <b>M4.2. Circuit breaker current module</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M4.2. circuit breaker current module</b> 2. Project of the experimental model of	X X		

		the module <b>M4.2. circuit breaker current module</b> 3. Experimental model of the module <b>M4.2. circuit breaker current module</b>	---		
	A1.4.3. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for the acquisition, storage and data transmission of medium voltage power circuit breakers – <b>M4.3. circuit breaker data acquisition module</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M4.3. circuit breaker data acquisition module</b> 2. Project of the experimental model of the module <b>M4.3. circuit breaker data acquisition module</b> 3. Experimental model of the module <b>M4.3. circuit breaker data acquisition module</b>	X  X ---		
	A1.4.4. Elaboration, realization and experimentation of the <i>model</i> for the multicriteria analysis of the technical condition of medium voltage power circuit breakers – <b>M4.4. circuit breaker condition analysis module.</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M4.4. circuit breaker condition analysis module</b> 2. Project of the experimental model of the module <b>M4.4. circuit breaker condition analysis module</b> 3. Experimental model of the module <b>M4.4. circuit breaker condition analysis module</b>	X  X ---		
	A1.4.5. Elaboration, realization and experimentation of the <i>experimental model</i> of the module for estimating the consumed and remaining lifetimes of medium voltage power circuit breakers – <b>M4.5. circuit breaker lifetime module</b>	1. Documentation report regarding the definitions of the functions and structure of module <b>M4.5. circuit breaker lifetime module</b> 2. Project of the experimental model of the module <b>M4.5. circuit breaker lifetime module</b> 3. Experimental model of the module <b>M4.5. circuit breaker lifetime module</b>	X  X ---		
5	<b>A1.6. Acquisition for the experimental models</b>	1. Development of technical			

		specifications and documents required for procurement start 2. Carrying out the auctions 3. Reception of purchased materials and their deployment in the economic circuit of the company	partial		
	A1.6.1 Partial discharge sensor assembly to electrical power transformers	Equipment	-----		
	A1.6.3 Component test stand for each SMEESE PROD CHE	Equipment	-----		
	A1.6.7 Cooling oil detection and lubrication oil sensor set for hydrogenerator	Equipment	x		
	Generator stator module	Equipment	-----		
	A1.6.8 Hydrogenerator data acquisition device	Equipment	-----		
	A1.6.9 Aquisition of Kit for : sensors for online monitoring of the turbine drive oh hydrogenerators; sensors for online monitoring of the directing device of hydrogenerators; sensors for online monitoring of the cooling system of hydrogenerators; sensors for online monitoring of the fire extinguishing installation of hydrogenerators.	sensors for online monitoring of the turbine drive oh hydrogenerators; sensors for online monitoring of the directing device of hydrogenerators; sensors for online monitoring of the cooling system	-----		
		sensors for online monitoring of the fire extinguishing installation of hydrogenerators.	-----		
	A1.6.10 Continuous acquisition device vibration endwinding	Equipment	-----		
	A1.6.12 On-line monitoring sensors at transformer terminals and oil analysis from condens pots of terminals	On-line monitoring sensors at transformer terminals	-----		
		oil analysis from condens pots of terminals	x		
	1.6.13 Continuous acquisition device from circuit breaker	Equipment	-----		
	A1.6.15 Acquisition of Notebook	Equipment	1(partial)		
6	<b>A2.2. Acquisition of components and spare parts for prototype development</b>	1. Development of technical specifications and documents required	X		

		for procurement start 2. Carrying out the auctions 3. Reception of purchased materials and their deployment in the economic circuit of the company	partial  -----		
7	Management	First stage	x		
8	Communication and Publicity	1. Project website 2. Announcement regarding the start of the project in the "Electricianul" magazine 3. Announcement on company's website about the project start, main objective and expected results 4. A scientific paper written for the conference SME 2021	x		
9	Audit	Stage I	x		