

Development of hybrid electron accelerator system for the treatment of marine diesel exhaust gases

Outcome of the technical meeting in Riga: 10-11 Sept 2018

	Technical task	Responsible institution and person	Deadline	Expected result	Cost of material	Cost of personnel	Link to the WP, milestone, deliverable
1.	Functioning marine diesel engine is made available at the Riga Ship yard	RKB	10.09.	Fully functioning Marine diesel engine is available at RKB-NOHAB i Trollhättan type SF15RS four stroke diesel with 560 HP power	To be filled by RKB	To be filled by RKB	D2
2.	Inspection & initial drawing preparation	RTU	17.09	General 3D drawing of engine & exhaust system placement in dry dock environment	50	48 h scientific pers.	D3
3.	Initial marine engine test program, initial principal schemes of the entire system	INCT	30.09.	Test program for engine parameters measurements – flow rate, temperature, Sox and NOx amount, fuel probes. Principal scheme of the entire system, including all necessary components and possible upgrades	To be filled by INCT	To be filled by INCT	
4.	Design concept for initial measurements	INCT	30.09	Draft drawings for measurement system sensors placement in exhaust pipe, requirements, fixation, precision, connection.	To be filled by INCT	To be filled by INCT	
5.	Precise 3D measurements of the engine exhaust system and dry dock critical environment	Remontowa	10.10.	Precise 3D drawings of the engine exhaust system and dry dock critical environment made using 3D measurement system.	To be filled by Remontowa	To be filled by Remontowa	Deliv.3
6.	Exhaust pipe	RTU, RKB	27.09	Sensor placement and fixation	300	32h – scientific pers.	

	preparation for initial measurements			preparation in exhaust system. Connection and support for measuring system.		16h - technicians	
7.	Initial measurements of critical flue gas parameters	INCT, RTU, RKB	10.10.	Flue gas flow, temperature, SOx, NOx content measurements. 3-day measurement session.	To be filled by RKB and INCT	72h scientific pers. 32h – technicians or to be filled by INCT	
8.	Kick of meeting	ALL	10.10.				D1
9.	Questionnaire for economic analysis of the system and to define the product	Biopolinex	10.11.	Questionnaire for system parameters description, product, its parameters, qualities, market definition. Alternative product identification, comparison.	To be filled by Biopolinex	To be filled by Biopolinex	
10.	Chemical analysis of diesel fuel	INCT	To be filled by INCT	Chemical content of fuel used for initial and further tests	To be filled by INCT	To be filled by INCT	
11.-	Estimation and design of shielding for the reaction vessel and Electron Beam Lamp	Fraunhofer	To be filled by Fraunhofer	Shielding for ebeam eba300 lamp & 600mm diameter process vessel. Shielding must provide safety of operation for the system and all involved personnel.	To be filled by Fraunhofer	To be filled by Fraunhofer	D3
12.	Design guidelines and parameters for Electron Beam Lamp window protection air curtain are provided	Fraunhofer, ebeam	To be filled by Fraunhofer and ebeam	Definition of Electron Beam Lamp window protection air curtain (to prevent window corrosion protecting it from exhaust gases) main operation parameters, design guidelines, air flow parameters, flow formation means and dimensions.	To be filled by Fraunhofer and ebeam	To be filled by Fraunhofer and ebeam	D3
13.	Appropriate accelerator is provided to Riga	ebeam	10.06.2019. or to be filled by	Electron Beam Lamp delivered at RKB	To be filled by ebeam	To be filled by ebeam	D4

	shipyard		ebeam				
14.	Calculations of reaction vessel	INCT, ebeam, Fraunhofer	30.12. or to be filled by ebeam, INCT and Fraunhofer	Sketches, draft drawings, calculations of reactor vessel critical parameters, allowing to proceed to detailed drawing creation	To be filled by ebeam, INCT and Fraunhofer	To be filled by ebeam, INCT and Fraunhofer	
15.	Exact drawings for reaction vessel fabrication*	RTU, INCT	To be filled by INCT and RTU	Exact technical documentation for fabrication and installation requirements of reaction vessel	To be filled by INCT and RTU	To be filled by INCT and RTU	MS1
16.	Calculation & Design of cooler	INCT	30.12.	Calculation results, sketches and draft drawings of cooler allowing to proceed to detailed drawing creation	To be filled by INCT	To be filled by INCT	MS1
17.	Final design of cooler*	RTU, INCT	20.02. or to be filled by INCT and RTU	Exact technical documentation for fabrication and installation requirements of cooler	To be filled by INCT and RTU	To be filled by INCT and RTU	MS1
18.	Design for Electron Beam Lamp window protection air curtain are provided*	Fraunhofer, INCT	20.02.	Exact technical documentation for fabrication and installation requirements of Electron Beam Lamp window protection air curtain	To be filled by INCT and Fraunhofer	To be filled by INCT and Fraunhofer	MS1
19.	Integration of components in the system and final drawing preparation*	Remontowa	10.04. or to be filled by Remontowa	Set of final technical documentation, including drawings of the system with all the component integration, principal schemes, assembly and detailed drawings	To be filled by Remontowa	To be filled by Remontowa	MS1
20.	Manufacturing of reaction vessel*	RTU, RKB	01.07.2019.	Reaction vessel fabrication using final technical documentation	To be filled by RTU and RKB	To be filled by RTU and RKB	D5
21.	Manufacturing of cooler*	RTU, RKB,	01.07.2019.	Cooler fabrication using final technical documentation	To be filled by RTU and RKB	To be filled by RTU and RKB	D5, MS1
22.	Manufacturing of air	RTU, ebeam,	01.08.2019.	Air curtain fabrication using final	To be filled by	To be filled by RTU,	D5

	curtain*	CERN	or to be filled by RTU, ebeam and CERN	technical documentation	RTU, ebeam and CERN	ebeam and CERN	
23.	On site installation of cooler, reaction vessel, Electron Beam Lamp, air curtain*	RTU, RKB	10.08.2019.	Cooler, reaction vessel, Electron Beam Lamp, air curtain installed in the engine exhaust system, using principal	To be filled by RTU and RKB	To be filled by RTU and RKB	D5
24.	Measuring devices are provided and installed on the prototype *	INCT; RTU	10.09.2019.	Measuring devices are installed in the engine exhaust system following design drawings and principal schemes	To be filled by RTU and INCT	To be filled by RTU and INCT	D6
25.	Prototype is made ready for the tests *	All	10.10.2019.	Prototype assembly ready			MS2
	Dosimetry measurements of the Electron Beam Lamp operation in the reactor vessel	CERN	30.10.2019. or to be filled by CERN	Dosimetry measurement results of the functioning Electron beam lamp	To be filled by CERN	To be filled by CERN	

* Resources can be fully estimated only when previous project activities are realised