



Project	GUTTA
Work Package number	2
Work Package title	Communication activities
Deliverable number	2.2.7
Deliverable title	Submission of one open-access peer-reviewed journal paper
Deliverable Responsible Partner	UNIZD
Deliverable Lead authors	Josip Orović (Unizd), Marko Valčić (Unizd), Vlatko Knežević (Unizd), Zoran Pavin (Unizd)
Deliverable Contributors	-
Deliverable due date	30-04-2022
Deliverable latest review date	05-08-2022

1. Executive Summary	1
2. Key information on the paper	1

1. Executive Summary

This report documents the submission and publication of an additional peer-reviewed journal paper related to GUTTA project's developments.

For the shortcuts employed in this report, we refer to the official GUTTA Glossary, which can be found at <https://zenodo.org/record/3676344>.

2. Key information on the paper

According to the Activity 2.2, the University of Zadar was committed to submit one open-access peer-reviewed journal paper. The process and the abstract of the published paper are shortly documented in this section.

The following paper was submitted on April 12, 2022, and published on May 13, 2022:

Comparison of the on Board Measured and Simulated Exhaust Gas Emissions on the Ro-Pax Vessels

Authors: Josip Orović (Unizd), Marko Valčić (Unizd), Vlatko Knežević (Unizd), Zoran Pavin (Unizd).

Journal: Atmosphere 2022, 13(5), 794; <https://doi.org/10.3390/atmos13050794>

URL: <https://www.mdpi.com/2073-4433/13/5/794>

Abstract

Increasingly stringent environmental requirements for marine engines imposed by the International Maritime Organisation and the European Union require that marine engines have the lowest possible emissions of greenhouse and harmful exhaust gases into the atmosphere. In

this research, exhaust gas emissions were measured on three Ro-Pax vessels sailing in the Adriatic Sea. Testo 350 Maritime exhaust gas analyser was used for monitoring the dry exhaust gas concentrations of CO₂ and O₂ in percentage, concentrations of CO and NO_x in ppm and exhaust gas temperature in °C after the turbocharger at different engine loads. In order to compare and validate measured values, exhaust gas measurement data were also obtained from a Wartsila-Transas simulator model of a similar Ro-Pax vessel during the joint operation of the engine room and navigational simulators. All analysed main engines on three vessels had complete combustion processes in the cylinders with small differences which should be further investigated. Comparison of on board measured parameters with simulated parameters showed that significant fuel oil reduction per voyage could be accomplished by voyage and/or engine operation optimization procedures. Results of this analysis could be used for creating additional emission database and data-driven models for further analysis and improved estimation of exhaust gasses under various marine engine conditions. Additionally, the results could be useful to all interested parties in reducing the fuel oil consumption and emissions of greenhouse and harmful exhaust gases from vessels into the atmosphere.