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ICUTRAIN: EXPLOITING SPACE AND RAILWAYS ASSETS TO FACE PANDEMICS

Abstract

As the pandemic evolves dramatically worldwide, the number of available intensive care units (ICU) in the hospitals has proven one of the major criticalities. To face this issue, in the last year a huge number of field ICU hospitals were set up, first in China and then in Europe. A field ICU hospital is a small mobile medical unit, or mini hospital, that temporarily takes care of virus cases on-site. In the frame of an ESA ARTES IAP Contract, an Italian team headed by Sital and composed of other Angel Companies (Eikontech, MerMec, BrightCyde and SkyComm) is designing and developing a modified passenger train to create ready to use and fast deployable ICUs equipped with up-to-date communication tools. The train is made available by Trenitalia, the Italian railways manager, and is an already pre-modified convoy developed in cooperation with the Lombardy Regional Authority. Health experts from the Apulia Region cooperate with the ICUTrain team in defining the medical equipment to be mounted onboard the train. The proposed ICU train will feature seamless, uninterrupted connectivity through terrestrial and satellite

connections and will exploit GPS tracking. Connectivity will allow constant data transfer with central structures, which would support diagnoses and would help onboard nurses and doctors in treating patients. Even if the ICUTrain has been conceived as a response to the COVID-19 pandemic, its features make it a flexible solution in case of a wide range of emergencies and disasters. With a fleet of such trains strategically placed, response to emergencies would be fast and effective, with the only limitation of the railways infrastructures. The team will start the ICUTrain pilot demonstration campaign by the end of 2021. During the field tests, satellite connectivity on the move will be demonstrated, as well as the capability for the medical equipment onboard the train to collect and analyze physiological parameters. The final target of ICUTrain is to pave the way for the industrialization of the pilot convoy, which may represent a strategic asset for future disaster managements.