National Media and Infocommunications Authority • Hungary

Budapest, April 27, 2021

Subject: "Reference letter" for Narda Safety Test Solutions GmbH (Germany) for supply and execution
of project Ref No. EKR000092122020: *Network Expansion of RF Spectrum Monitoring Stations*

TO WHOM IT MAY CONCERN

It is hereby confirmed that company *Narda* Safety Test Solutions GmbH having its registered offices in Sandwiesenstr. 7 - 72793 Pfullingen - Germany, within the frame of Contract with Ref No. EKR000092122020, successfully implemented, delivered and finalized the project: "Network Expansion of RF Spectrum Monitoring Stations", within the execution period from May to October 2020. The total amount of supply was EUR 225.000 excl. VAT

Scope of project implementation:

- *Delivery of 9 pcs ITU-R S.M. Handbook compliant HDR radio spectrum monitoring receivers (model: SignalShark Remote Unit) for expansion of existing network of monitoring stations*
- *Narda Signal Shark Receivers included following options and functions:*
  Scan Spectrum, Real-Time Spectrum, Spectrogram, Level Meter, Analog Demodulation, Persistence Spectrum, IQ-Streaming according to VITA 49.1, Spectrum Streaming according to VITA 49.2, remote control via SCPI commands.
- *Contract included a 24-month warranty and maintenance period, consultation services for hardware and software integration, as well as professional support services and training.*
- *After successful completion of installation, acceptance and full operation of the purchased receiver stations, software for TDOA/AOA emitter localization as well as ITU compliant spectrum monitoring from Decodio AG Switzerland (DECODIO RED and DECODIO Localizer) was installed and successfully tested together with the previously installed receiver stations from Narda.*
- *In addition to the Narda receivers mentioned above, the installation has been extended by Narda with the Automatic direction Finding Antenna (ADFA2) of Narda for AoA bearings based on correlative interferometry (SHF/VUHF) and Watson-Watt (HF) technique together with TDoA localization using the integrated omnidirectional antenna element of ADFA2.*
- *These TDOA/AOA tests were performed with stationary installations (mast/roof) and vehicles.*
- *The additional AoA and TDoA functions were producing the expected benefit and performance to effectively locate unintended emitters, e.g. obsolete repeaters, pirate stations, jammers, as well as other sources of interferences, like non-conformant transmitters.*
- *Beside the localization functionality, Decodios spectrum monitoring functionalities of Decodio RED were tested and their benefit was confirmed. This includes automatic detection and decoding of PMR modes for identification of different stations/networks, ITU compliant signal analysis and measurement functions, automatic generic emission detection, alarming, narrow- and wideband occupancy measurements, channel- and band-scans, automatic sensor-tasking and remote-control of all connected stations.*

Narda Safety Test Solutions GmbH and Decodio AG have executed above-mentioned project with high sense of responsibility and professionalism, complying with all rules of good and qualitative execution of project.

This document is issued upon relevant request for participation in a tender.

For *National Media and Infocommunication Authority (NMHH)*

Ernő Gáspár
Head of Department