

## SHORT TERM SCIENTIFIC MISSION (STSM) – SCIENTIFIC REPORT

The STSM applicant submits this report for approval to the STSM coordinator

**Action number: CA15127**

**STSM title: Ad-Hoc hybrid, wireless-satellite, communication network for fast deployment after disaster**

**STSM start and end date: 20/01/2019 to 26/01/2019**

**Grantee name: Arie Reichman**

### PURPOSE OF THE STSM

In the case of major disaster, the infrastructure can be so damaged that cannot be repaired in a short time. The goal of the STSM is to explore a proposal for an ad-hoc hybrid, wireless-satellite, communication network for fast deployment after a disaster.

This topic is relevant to **WG1 on Large-scale natural disasters** resulting in multiple correlated failures covering large areas and causing significant negative effects such communications infrastructure failures. The solution will be included in the action book.

Another purpose of the STSM is to better understand the areas of specialization of Ayecka Communication Systems to find future cooperation.

### **DESCRIPTION OF WORK CARRIED OUT DURING THE STSMS**

The visit followed the plan:

21.1.2019 - Presentation of INESC Coimbra, presentation of Ayecka Communication Systems and Arie Reichman research activities

22.1.2019 - Presentation of a proposal for recovery of an area severely affected by a disaster seems is through the creations of a mesh network through the deployment surviving Gateways (GW) or if necessary adding new GW and random spread of Access Points (AP) that will allow people in the disaster are to communicate to the outside of the disaster area (using multi hops throw the APs to reach the GW).

Updates of AR research relevant to RECODIS Book Chapters.

23.1.2019 -. Documents updates related to book chapters. It was decided that the work would best fit in chapter "Post-disaster and Emergency Networks" led by Gianluca Rizzo. 24.1.2019 - Topics of collaboration with and without industry. Visit at Active Space Technologies, a European based company operating in space, aeronautics, and nuclear industry. It provides Engineering and Scientific services, including design and onsite service support, in mechanical engineering (thermal and structural analysis, fluid dynamics, design, high precision manufacturing, integration, and testing), electronics engineering (automation, embedded systems, digital control) and management support services for technology transfer and development projects.

25. 1.2019 - Visit conclusions and follow up topics.

### **DESCRIPTION OF THE MAIN RESULTS OBTAINED**

1. Review of proposal for recovery of an area severely affected by a disaster through the creations of a mesh wireless system and decision to include in chapter "Post-disaster and Emergency Networks".
2. Analysis of the chapter 3.2, presently entitled "Region Disjoint Routing Schemes", and considering title change to reflect disaster resilient schemes and approaches.
3. Active Space Technologies found interest in cooperation with Ayecka Communication Systems to submit a joint proposal of developments of an On Board Processing modem for LEO satellite constellations. These types of systems are very effective during disasters.

### **FUTURE COLLABORATIONS (if applicable)**

1. Participation in the chapter on Post-disaster and Emergency Networks
2. Submission of a joint proposal of Ayecka Communication Systems and Active Space Technologies for developments of an On Board Processing modem for LEO satellite constellations.