SHORT TERM SCIENTIFIC MISSION (STSM) – SCIENTIFIC REPORT

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

Action number:	**COST Action 15127, RECODIS**
STSM title:	**Multi-Failure Multi-Technology Optical Network Resilience (No. 41 351)**
STSM start and end date:	**25/06/2018 to 30/06/2018**
Grantee name:	**Tibor Cinkler, BME, Budapest, Hungary**

PURPOSE OF THE STSM/

The purpose of the STSM was to exchange experience in improving resilience and availability of modern networks particularly in case of disasters that often cause more than a single failure. The purpose of this discussion was updating the structure and topics of the COST book in this regard as well as deepening the collaboration of the Host and the Visiting institution, i.e., of the PG and the BME.

The four targeted outcomes that were planned in the STSM application were all achieved:

(a) Analysis of characteristics of multiple failures following the natural disasters in optical networks and assessment of their impact on the performance of the optical network infrastructure;

(b) Discussion of design aspects of optical network architectures towards achieving/improving their resistance to disaster-based failures;

(c) Preparation of the structure (table of contents) of the chapter of the final RECODIS book on resilience of optical networks under natural disasters (to be written after completion of this STSM).

(d) Discussing the impact of parallel presence of multiple technologies for potentially achieving higher availability.

DESCRIPTION OF WORK CARRIED OUT DURING THE STSMS

The work carried out during the STSM is in accordance with the plans defined in the STSM application.

a) A presentation made by the STSM Grantee at the STSM host on the first day of the STSM focused on discussion of state-of-the-art solutions in enhancing the availability of the Radio Access and Optical FrontHaul Part of the future 5G networks.

b) Joint discussions with the STSM host to work out / summarize the set of recommendations to evaluate the resistance of optical networks to disaster-based failures as well as to design/update the architecture of

optical networks with improved resistance to natural disasters.

c) Preparation of the structure (table of contents) of the chapter of the final RECODIS book on the resilience of optical networks under natural disasters (to be written after completion of this STSM). The contribution will be most likely added to Part 2 of the Book that will be extended. A potential extension of Chapter 2.8: Techniques of network design / update of characteristics of existing network architectures to improve their resilience against technology-related disruptions (WG3) is to be considered. This work and the contribution of the Grantee to the book has been moved to Chapter 12. See paragraph d).

d) Discussing opportunities for enhancing the availability of the access infrastructure of the converged fix-mobile networks. The techniques will include the optimisation of the wired access part as well as allowing the coordinated use of different techniques. The proposed preliminary ToC (Table of Content) is defined as included in the next section.

DESCRIPTION OF THE MAIN RESULTS OBTAINED

The proposed preliminary ToC (Table of Content) is defined as follows:
12 Improving the survivability of RANs (Radio Access Networks)
12.1 The Availability-Throughput-Power Tradeoff
12.2 RAN and (optical) FrontHaul
12.2.1 Availability Enhancement via Consolidation and Selective Switch-Off
12.2.2 Availability Enhancement via front-haul topology interleaving
12.2.3 Enhancing Availability via Vertical (Heterogeneous, Multi-Technology) Handover
12.2.4 Enhancing the Availability via Multiprovider Handover
12.2.5 The whole picture: 3D handover for constrained or optimal Availability-Throughput-Power requirements
12.3 Wireless Backhaul Networks
12.2 will be jointly written.
12.2 will be coordinated and mostly written by BME.
12.3 will be coordinated and mostly written by KTH.

FUTURE COLLABORATIONS (if applicable)

The Grantee shall work on the agreed book chapters with his team after completing the STSM. He will maintain the intensive collaboration with the host institute as well as other COST ACTION 15127 RECODIS partners until the book is finalized for printing. The collaboration will be particularly intensive between PG Gdansk, Poland; KTH Stockholm, Sweden and BME Budapest, Hungary.

The Grantee invited his Host for a similar STSM to the institution of the Grantee, Budapest University of Technology and Economics, Budapest, Hungary.

The two institutions, the PG and the BME intend to sign a MoU on research and educational collaboration as well as on exchange of students.