



Reliability of Optical Components and Devices at Communications Systems and Networks

Objectives

The main objective of the Action is to develop methods *to ascertain and improve the reliability of the new types of optical components and devices* in communications networks and systems. Aspects regarding network and component costs, environmental conditions and installation procedures for equipment in core transport networks, in subscriber access networks and in in-house (local area) networks are included.

Most of the effort will be used to improve the understanding of the failure mechanisms of new types of optical components and devices. Simultaneously, information on their field behavior will be gathered to study the effect of the service environment. Following this, efforts will be concentrated on improving life test methods. Finally, lifetime estimation methods will be analyzed and developed.

This research work will be done in co-operation with component and system manufactures and research institutes and universities. The action will also use the results and achievements of earlier reliability actions (COST 246, 218 etc.). Thus, suppliers will be helped in developing and manufacturing reliable components and devices. The final objective is also the appropriate transfer of results and experience to help the standardization bodies, e.g. ETSI TM1, CECC 86BXA, IEC 86B, and ITU-T.

Participation and working methods

Fifteen European countries have signed the MoU (Memory of Understanding). Experts from over 20 companies, universities and research institutes started the action in December 2000.

The chairman of the management committee (MC) is **Dr. Hans G. Limberger**, IOA-EPFL, Switzerland (hans.limberger@epfl.ch). Secretary is **Dr. Francis Berghmans**, SCK-CEN, Belgium (fberghma@sckcen.be).

So far, two Working Groups, WG1 for networks and systems and WG2 for components, have been established. Working methods contain collaboration experiments, life-tests and theoretical studies, short-term scientific missions within participating companies/labs, workshops,

deep discussions at working and study group meetings etc. The results will be disseminated by workshop and conference presentations, publications and a final report.

Working Groups

WG1, Reliability of Optical Networks and Systems Including Free Space Communication.

Chairperson is **Dr. Lena Wosinska**, Royal Institute of Technology, Sweden (lena@it.kth.se).

WG1 has started

- developing models to estimate survivability of optical networks in cooperation with COST291.
- cost studies for different survivability strategies
- network optimization from reliability and cost point of view
- defining the weak points in the network regarding components and systems (input for WG2)
- collecting reliability data for components from suppliers and WG2
- defining the reliability requirement of components for optical networks (input for WG2)

WG2, Reliability of passive components, jumper cables, fiber coatings etc. incl. high optical power application and irradiation effects,

is chaired by **Dr. Francis Berghmans** (fberghma@sckcen.be), SCK-CEN, Belgium.

WG2 has started studies on

- reliability test methods and relevant test series
- round robin life-tests of certain components
- acceleration factors
- standards and open questions
- high optical power effects on all passive components
- irradiation effects
- weak spots (failure mechanisms)
- service environments, standards
- field data of components
- life time estimation methods

Start of action: December 2000

End of action: June 2006

Workshops on Reliability of Optical Networks, Systems & Components

- *COST 270 WG1 Workshop on "Reliability issues in Next Generation Optical Networks (RONEXT)" to be co-located with the 7th International Conference on Transparent Optical Networks ICTON, Barcelona, Catalonia, Spain, July 3-7, 2005.*
- *COST 270 Workshop on Reliability of Optical Networks, Systems & Components III, part of SPIE Photonics Europe, Strasbourg, France, April 3-7, 2006.*