

5th Workshop on SMART Cable Systems

Dubai, UAE, 17-18 April 2016

Workshop summary

Objectives:

- To discuss issues related to SMART cable systems (scientific sensor enabled submarine cable systems) including:
 - Review of the ITU/WMO/UNESCO IOC Joint Task Force (JTF) - Plans and Wet Demonstrator concept
 - Current industry developments and advice
 - Demonstrator (sea trial): potential sites and design options
 - Technical solution recommendations
 - Targeted supporters and technical collaborations
 - Funding opportunities and schedule

Results and next steps:

Healthy discussions took place about the scientific rationale, appropriate sensors (focusing on bottom temperature, pressure, and 3-axis acceleration), a wet demonstration project, funding avenues, interaction with industry, legal and permitting aspects, and outreach. A phased approach that recognizes the various challenges is envisioned. The “wet demo” will be primarily a mechanical prototype that will show the ability to install sensors and deploy from a cable ship, likely attaching to an existing cabled ocean observatory for power and communications using incremental cable ship days. Accelerometers are already in one vendor’s repeater, and penetrators/”blister pacs” available from others. The electrical and optical integration into a full telecom system would occur in a subsequent phase, for instance, installing several SMART repeaters on short or refurbished systems where the legal and financial aspects would be less challenging. The science community needs to prioritize nominal cable routes, acknowledging this phased approach and constraints from the cable industry. Prospective system owners need to know about the SMART option (including funding models) at the very beginning of project conceptualization.

Good communication amongst all stakeholders will be crucial to this complicated undertaking. JTF will work with ICPC to develop lines of communication between the two organizations, for instance to clarify that SMART capability is an option contingent on many factors, not the least of which are funding and legal issues.

Workshop participants thanked United Arab Emirates for providing the meeting venue including coffee breaks and lunches.

Presentations and discussions:

- This workshop was attended by network operators, optical fiber/cable vendors, research institutes, observatories, universities and consultants. Views from different types of organizations were exchanged and study items/challenges were clarified.
- Opening remarks were presented by the ITU
- Speakers from research institutes, observatories and universities indicated:

- Observed climate change phenomena (sea level rise, rate of CO2 increase, warming temperature records, etc.) and urgent need for taking mitigating actions
- That earthquakes and tsunamis are happening quite often and need early warning to save lives
- Basic idea for SMART (green) cable systems – scientific sensor enabled telecommunication submarine cable
- Current activities on measurements in the deep ocean:
 - a long term European commitment for long term seafloor and water column monitoring
 - Benefits and requirements for ocean bottom measurements for tsunami early warning and earthquake science
 - Contribution of SMART Cable Systems to ocean and climate science
- Speakers from consultancies indicated:
 - Importance of participating at an early stage of cable system implementation project to include scientific sensors
 - The nature of submarine telecommunication cable business:
 - Extremely capital intensive
 - Years of planning and heavy expenditure before receiving revenues
 - Politically sensitive – Licenses and permits may be difficult
 - However, ultimately capable of generating significant income over many years
- Speakers from a network operator and a vendor indicated:
 - Submarine cables need to be extremely reliable (25-year guarantee)
 - Scientific sensors cannot be replaced or updated once installed
 - Business model (who pays the additional cost for sensors) needs to be clarified
- Observatories indicated how they can support the wet demonstrator project. Functional requirements for sensor enabled submarine cable repeaters were provided.
- At the wrap-up session, the JTF chair (Prof. Christopher Barnes, University of Victoria) indicated:
 - The urgency to move forward
 - That the telecom submarine cable is a good vehicle for scientific sensors with incremental cost

Changes of the Chair and the Vice Chair:

- Outgoing:
 - Chair: Christopher Barnes
 - Vice Chair: David Meldrum
- Incoming
 - Chair: Bruce Howe
 - Vice Chair: Nigel Bayliff