## Editorial

*Dear Readers,*

*This is the 2nd general LS Spectrum edition of 2015 covering a wide variety of topics in spectrum management and wireless communications.*
*Read in this edition about our new mission planning tool for the planning of vehicular ad-hoc communication and remote sensor networks for crisis management.*
*You will also find many interesting articles about our project business.*
*Read about the 700 MHz study we carry out for the European Commission in light of the Lamy report or the non-ionizing radiation (NIR) study. LS telcom has also recently delivered TETRA base station shelters for an iron ore mine and carried out spectrum measurements in Africa. But this is not all...have a look for yourself. To find out more about LS telcom, visit us at the WRC in Geneva from 2nd until 13th November. We are looking forward to discussing how we can help you manage the spectrum more efficiently. If you want to understand spectrum liberalisation better, then we recommend the recently published book 'Understanding spectrum liberalisation', written by PolicyTracker's Managing Director Martin Sims, journalist Toby Youell, and our Director of Spectrum Consulting, Richard Womersley.*

*We hope you enjoy reading this magazine!*

**Dr. Georg Schöne, Dr. Manfred Lebherz, Roland Götz**
Members of the Board

## Latest

# Costa Rican regulator SUTEL acquires the Wizard Work-flow Configuration Tool to harmonise and automate the technical process of their SPECTRA system

*As an additional step forward in their internal spectrum management process optimisation, SUTEL has acquired LS telcom's Wizard Work-flow Configuration Tool to be added to the technical analysis module SPECTRAemc to automate, and therefore increase the efficiency of the frequency assignment processes for land mobile and fixed services.*

SUTEL has carried out a remarkable task bringing up to date its national frequency user data base using its integrated Spectrum Management and Monitoring System, delivered and put into operation at SUTEL's headquarters in San José by LS telcom and Rohde & Schwarz respectively in August 2014. Now with a complete and precise database, SUTEL will be using the Wizard Configuration Tool to harmonise and automate its daily technical analyses calculations to assign new frequencies to its users. The project scope comprises the Wizard Configuration Tool knowledge transfer to SUTEL users, and the development of the first two wizards for land mobile and fixed services. The completion of the project is scheduled for December 2015. Once the knowledge transfer is complete, SUTEL users will be proficient in developing new wizards on their own as their requirements evolve. ←

# "Understanding Spectrum Liberalisation"...

*.. is the title of the recently published book by co-authors Richard Womersley, Director of Spectrum Consulting at LS telcom, Policy-Tracker's Managing Director Martin Sims and journalist Toby Youell.*
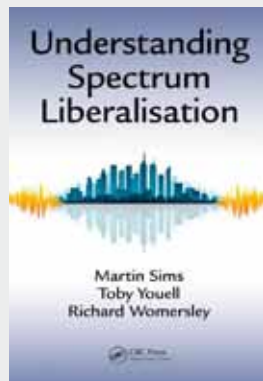
Gérard Pogorel, Professor of Economics and Management-Emeritus, Telecom ParisTech said "With their new book 'Understanding Spectrum Liberalisation', Sims, Youell and Womersley offer an impressive survey of radio spectrum technologies and policies in the second decade of the millenium. At a moment when wireless services and applications become always more versatile and ubiquitous, the authors succeed in presenting in layman accessible language the complex industry and policy challenges associated with the future of broadcasting and all aspects of wireless services. They provide a balanced account of liberalisation policies, as well as a guide-book to the intricacies of frequency licensing. This book will help all those involved in spectrum related issues in the communications industry, and spectrum policy bodies and institutions by putting into perspective the many dimensions of their trade."

The launch ceremony of the book took place on 16th of October in London, where five participants won copies of the book in a raffle.

For more information and to order the book, go to:
*https://www.crcpress.com/Under-standing-Spectrum-Liberalisation/Sims-Youell-Womersley/9781498705028* ←

# Ad-hoc broadband data network for PPDR (Public Protection and Disaster Relief)

*LS telcom develops Swarm Mission Planning Tool for Vehicular Ad-Hoc Communication & Remote Sensor Network.*

In a joint Franco-German research project, LS telcom developed a swarm mission-planning tool, which builds and controls an ad-hoc communication and remote sensor network based on unmanned airborne vehicles (UAVs) and unmanned ground vehicles (UGVs).

The aim of the project, which comprises a consortium of French and German companies and research institutions, was to provide a broadband communication network for rescue forces and the ability to inspect the disaster area.

The network is made up of a swarm of drones and ground vehicles, which carry a transmitter and re-
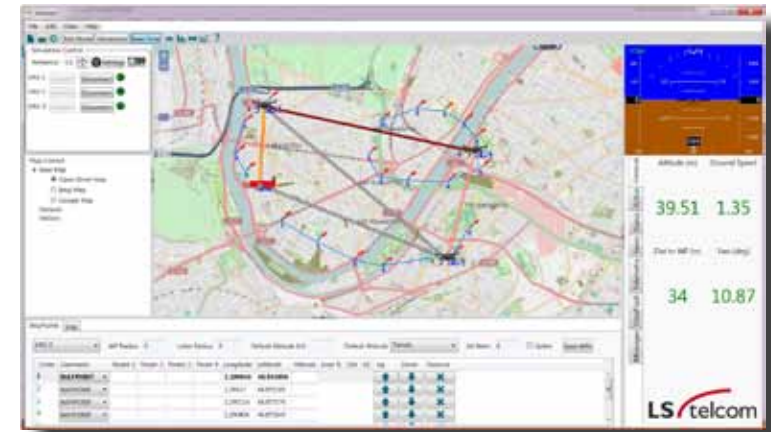


Picture: Mission Simulation

ceiver for data transmission as well as a GPS system for positioning. In addition, they carry cameras on board for real-time media footage of the disaster area - especially useful for otherwise inaccessible areas. Other possible payloads are radioactivity sensors, for example, in case of nuclear power station incidents. The vehicular ad-hoc network serves as emergency data communication link for rescue forces. The drones and ground vehicles streamline the information from their payload in real-time to the control station of the relief units.

With the help of the integrated GPS on the drones, the software displays the network of drones and ground vehicles in real-time on the map. At the same time battery status, height, and received power are displayed to control and ensure the connection between the vehicles while they are moving.

In a second step, the software will be able to simulate the ad-hoc network in advance. It will simulate the

radio coverage for each vehicle on the move and will send pre-programmed waypoints to the drones before take-off.

The mission-planning software will help crisis managers to reduce the time for network deployment considerably, indispensable during a crisis.

The ad-hoc broadband network was tested in demonstrations taking place in Dortmund/Germany, in April 2015, and Toulouse/France, September 2015, with potential users of the system, the German professional fire brigade and the Landeskriminalamt (the German state office of criminal investigation).

Apart from LS telcom, CEA, Airbus DS, Groupe Intra and Onera took part in the project as well as the Technical Universities of Dortmund and Aachen, the Fraunhofer Institute, Mirion Health Physics and the Kerntechnischer Hilfsdienst (KHG, German nuclear emergency service). ←
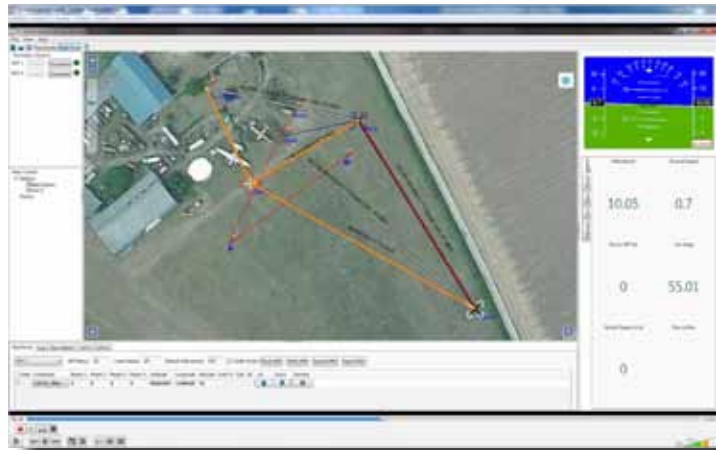


Picture: Real-time network display

# Turnkey delivery of CHIRplus_BC to Kuwait's Ministry of the Interior

*LS telcom delivered the fully-fledged analogue and digital broadcast planning and coordination system CHIRplus_BC to Kuwait's Ministry of the Interior (MoI), including extensive broadcast and tool training.*

Ziad Azhari, ETI president quoted MoI Engineers who attended the training as saying: "We were extremely pleased with the short implementation time of the software system CHIRplus_BC and with the comprehensive training we received from LS telcom."

The training included broadcast theory on digital terrestrial television, network planning and optimisation as well as international coordination in addition to CHIRplus_BC tool training. LS telcom broadcast experts trained seven engineers from the MoI Kuwait. ←

# Guinea signs maintenance contract

*The regulatory authority of the republic of Guinea, ARPT, has signed a perennial contract with LS telcom for the support and maintenance of its national monitoring system.*

In the past year, LS telcom delivered a state-of-the-art mobile monitoring station to Guinea, and integrated it with the existing system of ARPT.

The dedication, performance and excellence of LS telcom's team were

instrumental in the decision of ARPT to entrust LS telcom with the support and maintenance of their system. ←

# National spectrum audit in West Africa

*The LS telcom engineering team carried out spectrum measurements in five major cities of a Western African country with the LS OBSERVER portable monitoring unit (PMU).*

The objective of this audit was to measure the real spectrum occupancy, identify underused bands, and assist the regulator in better planning the spectrum. In each city, between two and four measurement points were chosen and the observation period was of 24 hours minimum for each measurement.
Through heat and rain, the team travelled some 2000 km to complete all the measurements in a record time of three weeks. The flexibility of the PMU (Portable Monitoring Unit), which can run on batteries for extended periods of time, and the innovative set-up chosen by LS telcom, was instrumental in the success of this audit. ←



# European Commission study: 700 MHz band for wireless broadband services in the EU

*LS telcom, together with our partner VVA Europe, is working on a study for the European Commission to consider the economic and social impact of repurposing the 700 MHz band for wireless broadband services in the European Union.*

The study will compare the various options for the 700 MHz band, and those for the remaining UHF television band below 700 MHz, in light of the Lamy report. In addition to considering the costs to broadcasters and consumers of the options, the study will also examine the social and economic impact both of the proposed enhancements to wireless broadband coverage that the use of the 700 MHz band could offer, as well as the impact on the broadcast landscape of the reduction in available spectrum for DTT services. ←

# Wi-Fi passive surveys for SportChek stores

*LS telcom provided measurement services to SportChek, Canada's largest retailer of sports equipment.*

The scope of the project was to define the best position of wireless access points (WAPs) in SportChek stores in Canada for an optimized indoor Wi-Fi coverage.

The work included the temporary installation of WAPs in the stores and the per-formance of a Wi-Fi passive survey using a site survey software suite. The survey also included a detailed inventory of the existing network, telephone systems and point of sales for each store to provide new wireless sales functionality for vendors. ←

# LS telcom conducts Non-Ionizing Radiation (NIR) study in Toronto

*Brookfield Properties mandated LS telcom to carry out a Radio Frequency Exposure Compliance Study for the tower buildings of one of their sites, "First Canadian Place", in Toronto, Canada.*

The goal of the study was to determine the power reduction required by some or all of the services for a tower worker to safely climb up any of the three towers. Brookfield Properties had requested that all services remain on air, if possible, at the maximum permissible power at which workers can work in the tower safely. The safety rating followed Health Canada's Radiofrequency Exposure Guidelines SC6 2015 limit for a controlled environment (formally known as "RF workers level"). The study was completed in several stages, including actual tower measurements performed by climbers and detailed EMF calculations using a 3D modelling software application.
The report evaluates the maximum operating levels for the different transmitters located on the rooftop in order to allow workers to reach the top of each tower from inside the tower.
First Canadian Place is Canada's tallest skyscraper and one of the "busiest" in terms of antenna activity and installations. ←
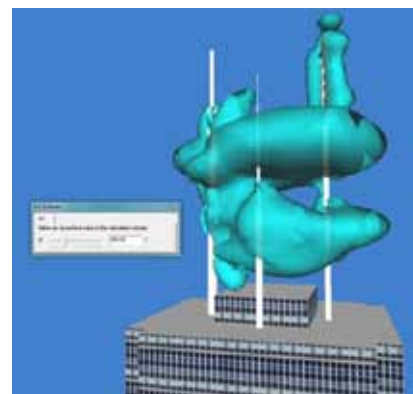


# LS telcom provides TETRA base station container shelters for Anglo American Group

*LS telcom delivered base station container shelters for the new TETRA communications system of the Sishen iron ore mine in Kathu/South Africa operated by the Anglo American Group.*

The expansion of the mine has exceeded the physical coverage area and capacity limits of the existing radio communication system. Safety incidents at the mine linked to poor communication necessitated the replacement of the system.
LS telcom carried out the complete installation of the TETRA base station shelters, including air conditioning, diesel generators and associated systems, as well as fire protection, cable management and electrical and RF reticulation. LS telcom also performs the commissioning as well as onsite delivery and logistics.
Uninterrupted network availability was required during the transition from the old to the new system, as the mine operates on a non-stop basis.
LS telcom together with the other project participants, Saab Grintek Technologies, Hytera and Dragon-Wave, needed to work to tight deadlines and milestones, due to the critical role of the mine's communication system.
Prior to this project, LS telcom performed the microwave link planning for the new TETRA system.
The Sishen iron ore mine is situated near the town of Kathu, in the isolated Northern Cape Province of South Africa. It is one of the largest open cast mines in the world with an ore body of approximately 14 km in lengths, 3.2 km in width and a depth of 400 m. ←

## Visit us at our Booth…

**World Radiocommuni-cation Conference, Geneva/Switzerland**
2nd – 13th November 2015

**PMR Expo, Cologne/ Germany**
24th – 27th November 2015

**LS telcom AG**
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HRB 211164
Board: Dr. Manfred Lebherz,
Dr. Georg Schöne,
Dipl.-Ing. Roland Götz
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## ITU Telecom World

LS telcom was present at the ITU World in Budapest from 12th to 15th October 2015. ←

## LTE is on the forefront

*Data usage has proliferated and so has the interest in LTE technology. This is reflected in the number of participants in this year's LTE courses.*
The training courses on LTE, taking place in Lichtenau, address the rising interest in LTE technology and network design. The courses are designed specifically to grow the delegates' understanding of the use of radio systems based on LTE technology. Delegates learn about S-OFDMA/SC-TDMA, MIMO technology, LTE TDD and FDD multiple access nodes, system architecture, in-building coverage issues, mobility and handover aspects and future evolutions of LTE. The last training was successfully held in October 2015. ←

Pictures:
Participants of the last LTE training in Lichtenau

## Upcoming training courses

**LS telcom Training Academy, Lichtenau/Germany**
- Managing and Regulating the Radio Spectrum: November 9-13, 2015
- Technical Issues in Radio Spectrum Management: November 16-20, 2015
- BC Planning Tool – CHIRplus_BC (Radio/TV, Analogue/Digital): Nov 9-11, 2015
- Broadcast Planning Exercises using CHIRplus_BC: November 12-13, 2015
- DVB-T2 – 2nd Generation Digital Video Broadcast: November 24-26, 2015
- White Space - A hidden Spectrum Resource? November 4-5, 2015
...and many more!

Download the calendar on www.LST.AG/Training. Alternatively you may contact Ms Sabrina Kautz by email to SKautz@LStelcom.com or by phone: +49 7227 9535 488 for further information on our seminars or for our customised training programmes. ←

## NEWS about SPECTRAemc

- The safety zone calculation in SPECTRA-emc now includes the evaluation of vector building data, and considers the complex two-ray wave propagation. The complete results of the antenna analysis will be displayed in 3D format. The user can export the results and visualize them in Google.
- The Link Clearance Check now considers new building constructions. The user can check whether new constructions will affect existing radio links.
- New Link Report (see picture).

- The long list of already available propagation models is complemented by the FCC model.

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