

## **Annex B – IST-050 RTG TERMS OF REFERENCE**

### **HF Interference, Procedures and Tools IST-050/RTG-022**

#### **I. ORIGIN**

##### **A. Background**

Power Line TeleCommunications (PLT, PLC) and various forms of Digital Subscriber Line (DSL) transmissions are rapidly evolving technologies using the existing mains electricity or telephone wiring for telecommunications with data rates higher than 1 MBit/s. As these lines were not designed for transmission of such high data rates, they will cause unintentional RF emissions which may adversely affect the established radio noise floor directly or by cumulative propagation from many such sources. The natural background noise possibly may be increased via groundwave and/or skywave propagation, the intensity of which depends on the electrical characteristics of the lines (balance, match, screening) as well as on the density and area coverage of the new broadband data access systems. Change of the noise floor due to this effect may happen up to several thousand km distance to these new noise sources.

Exact calculations of HF radio noise emission by the new wide bandwidth lines are impossible at this time because of missing models for these transmission systems. The new Task Group will have to investigate this and to find procedures, models and tools applicable for being able to determine the influence of PLT and DSL on reception of HF radio signals.

##### **B. Military Benefit**

Increase of the natural HF noise floor by widespread use of PLC and/or DSL will bring up problems for Military Radio Users as well as for HF Communication Intelligence (COMINT) in all NATO countries. The signal-to-noise ratio thus may be reduced for tactical and strategic HF radio as well as for fixed COMINT sites. First measurements and estimations show that HF radio noise emitted by broadband cable transmissions may increase just near to the lines as well as at very great distances and thus will have an international effect.

#### **II. OBJECTIVES**

##### **(1) Area of Research and Scope**

The proposed Task Group will address itself to the HF radio emission effects of the new broadband cable transmissions. It will investigate and find means that allow calculation of field strengths of HF noise radiated by PLT or DSL. This will then enable NATO and its nations to determine the threat to military HF radio communications and COMINT systems by PLT and DSL and to take the appropriate steps.

The work will include investigations in the following areas:

- Analyze existing and planned PLT and DSL networks and their characteristics regarding HF radio noise emission.
- Investigate methods of measuring the emissions from PLT and DSL networks.
- Investigate procedures and means to model PLT and DSL systems.
- Investigate methods to verify the models found.

**(2) The Specific Goals and Topics to be Covered by the Task Group**

The Task Group on HF Interference, Procedures and Tools will investigate the topics defined above under “Scope” and will conduct its research according to the attached Programme of Work. After that, NATO and its nations will be able to determine degradation of its HF radio communications and COMINT systems by PLT and/or DSL and in case of that will arrange for measures to be taken.

**(3) Expected End Products and/or Deliverables**

The deliverable of this research programme will be a final technical report summarizing the results of the study, to be published no later than December 2006.

**(4) Overall Duration of the Task Group**

The proposed Task Group will be performed under a three-year review cycle starting in January 2004, complying with the policies of the RTO and will follow a schedule to be drawn up as attachment to the PoW.

**III. RESOURCES****A. Membership**

Chair : Dr. Arto CHUBUKJIAN Canada.

**B. Nations Willing/Invited to Participate**

Canada, Georgia, Germany, Norway, Slovak Republic.

**(1) Membership**

This study will require broad NATO participation, with the membership ideally drawing on expertise in telecommunications, radio communications, antennas and radiowave propagation. IST Panel Members CA, GE, NO and UK have already declared their willingness to support this new Task Group. It is anticipated that additional members from other nations will participate.

**(2) National and/or NATO Resources Needed**

Each participating nation is expected to provide at least 2 person-years/year of effort towards the goals of this RTG, plus funds to allow their experts to travel to two RTG meetings per year. Members of the Task Group should have a suitable scientific background and be expected to devote a significant proportion of their time to supporting the goals of the Task Group. Nations are expected to fund the travel and subsistence of the participants and to provide access to relevant national data, experimental sensors, test beds, computer models, computer time, national range facilities etc.

In addition, Internet access is required for unclassified information exchange and collaborative activities. Identified RTA resources would be limited to standard support for publishing the final report. RTA support for consultants may also be requested. Support could be asked if needed for one or two Consultants per year.

**IV. SECURITY CLASSIFICATION LEVEL**

The security level will be Unclassified/Unlimited.

## **V. PARTICIPATION BY PARTNER NATIONS AND OTHER NATIONS**

This Activity is open to Pfp.

## **VI. LIAISON**

The work of the Task Group will be coordinated with other panels and activities within the RTO which deal with telecommunications, HF radio communications and/or modelling.

The work will also draw upon the “ECC report on PLT, DSL, cable communications (including cable TV), LANs and their effect on radio services” at the moment drafted by CEPT/ECC Project Team SE35 (European Postal and Telecommunications Administrations Conference/Electronic Communications Committee).

It will be useful to follow ITU-R activities related to this problem (ITU-R Study Group 1).

## **VII. REFERENCE**

IST Exploratory Team IST-ET-050.

