"Capacity Building and Strengthening Institutional Arrangement"

Analysis and sampling of air and air pollution

Working group n° 4
"Define a Measurement of Electromagnetic Field in a *Multi-source Site* "

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APAT

Agency for Environmental Protection and Technical Services

Define applicable criteria for an air monitoring network

Introduction:

When a place is radiated by several sources (the situation is almost typical in urban and sub-urban areas) the field is the addition of the values produced by each one, and, in case of not compliance with the reference levels, each source must be considered separately. If one (or more) of them results over the correspondent limit, a new, maximum allowable, value for the field produced by this source at the location of interest should be determined according a procedure of reduction in compliance. Consequently the operator (for the above source) will reduce the emitted power in order to meet the required environmental field value.

Define applicable criteria for an air monitoring network

Introduction:

The procedure is as follow:

1.Determine (measuring) the total electric field and each contribution at the location of interest, according the following relationship: $E_{TOT} = \sum_i \left(\frac{E_i^2}{L_i^2} \right)$

where E_i is the electric field produced by the *i*- source and L_i is the correspondent limit (L is frequency dependent).

2. In case of not compliance, it results: $E_{TOT} > 1$

and it means that one or more values must be reduced.

In order to know how to reduce the emitted power from the i- source, it is necessary to determine the reductive coefficient k_i, as follow: $C_i = \left(\frac{E_i^2}{L_i^2} \right) > 1$

is called normalized contribution, and the following relationship must be satisfied: $k_i^2 C_i = k_i^2 \left(\frac{E_i^2}{L_i^2} \right) < 1.$

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Activities:

1st phase

Discussion about general criteria to plan a intervention of EMF measurements.

2nd phase

Discuss about a measurement performed in the situation of sources whose characteristics are summarized in the following table:

Source	Frequency (MHz)	Measured Electric Field E_i (V/m)	Reference Level L_i (V/m)	Reference Level L_i (for residential area) (V/m)
Broadcast MW	0,999	28	60	6
FM broadcast 1	94	17,8	20	6
FM broadcast 2	105	3,5	20	6
Microwave Radio Link	17500	6,2	40	6

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Activities:

2nd phase continue

- choose measurement equipments (narrowband or broadband instruments, E-field or H-field probes, high or low frequency instruments, etc.);
- define experimental and theoretical steps;
- define a quality control protocol;
- try to perform, if needed, the calculation for the reductive coefficients k_i.

A) in a generic area (limits in the fourth column),
B) in a residential area (restricted limits in the last column)

3rd phase

Final presentation and discussion about working group's activities.