Feedback on the management of transmission lines magnetic fields in France

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Since 2010, almost all of the new 63-90kV circuits are underground links. Major projects at higher voltage level are in progress, such as the southeastern safety net which will be commissioned in December 2014 (three HVAC connected links of 17 + 25 + 65 km at 225kV). This is a representative illustration of the demanding permitting process of transmission lines.

When the reluctance to the visual impact has been solved, the management of electromagnetic fields remains the main social - more than environmental - concern. The presentation reviews the main topics of a probably unique background to mitigate decisive obstacles during the selection of the cable route: information and transparency are the keywords of RTE's action.

In 2012, the French government declared the establishment of a monitoring plan of 5000 point database of EMF measurement. The deadline is December 2017, and every circuit transmitting more than 400 A must be checked. The summary sheet (from the complete report) will then be publically available online.

RTE is also connected with the mayors of the 36000 French cities. Anybody can request his mayor to get a measurement performed by an independent and accredited organisation. The report is then added to the monitoring plan record set and is available online.

Since 2011, a dedicated and exhaustive web site (www.clefdeschamps.info) provides many educational sheets, frequently asked questions, videos, brochures, useful links… A special care is given to a friendly communication, with didactic and interactive games, quiz, and illustrations. A discussion with EMF referents is possible with a forum. The educational sheets present orders of magnitude of EMF values, MF in the environment, MF and health, regulations, official documents, etc.

From an engineering point of view, the cable system design (in trefoil formation) is favourable to low values of maximum EMF, well under the regulation values. R&D, calculations, models with finite element method and experimentations are carried out by RTE in order to improve the management of singular points such as junction bays (even if the regulations are already followed.

In 2015, a standard solution is developed, that proves to be efficient to divide magnetic field by a factor 2, and fast and easy to install: passive loops of 150 mm² copper cross section, laid on the top of the joint bay, just before closing it. Calculations, model results and site measurements are discussed by the authors in the present paper.

Finally, a golden rule as a conclusion: each RTE employee is the best ambassador to make EMF considerations more familiar. About 100 people per year, involved in consultation (permitting process) and project management, follow a two day training course to improve their knowledge in EMF and the relationship with the public. This is a very efficient way to bring the information on the fields.