ENVIRONMENTAL IMPACTS IN RURAL AREA OF A HV UNDERGROUND LINK

Laurent GOURIT, RTE, France, laurent.gourit@rte-france.com
Etienne SERRES, RTE, France, etienne-e.serres@rte-france.com
Peggy CHEVALIER, RTE, peggy.chevalier@rte-france.com

ABSTRACT

This paper gives an overview of an environmental study dealing with the implementation a HV underground cable (UGC) in a rural area. This study has been carried out looking at the before, during and after construction stages: from 2003 to 2004 for the initial report and during the construction, and from 2005 to 2006 for the environmental study after the construction had finished. The following article discusses the findings of this study.

KEYWORDS

Environmental impacts, recovery

INTRODUCTION

From historical reasons, RTE underground cables were dedicated to urban centers. Nowadays, because of the increasing environmental and social pressure, the general public acceptance of new overhead lines is more and more difficult, even in rural areas. Therefore, RTE use of underground cables in rural areas may increase in the near future.
The cost of an underground cable is partly linked to its length. Hence, RTE is expecting these lines to use a direct path in rural areas.
RTE decided to have a special focus on a new underground link to be built in a rural area (from July 2004 to commissioning in March 2005). This around 20 km 63 kV underground cable pathway is going through grasslands and cultivated areas for half its length. The main goals of this three years study were:

- Understand the actual impact of a High Voltage underground cable on the physical, natural and farming landscape;
- Study the behaviour of the vegetation situated above the UGC;
- Determine what impact limitation measures are needed, as well as the best guidelines for a worksite of this type.

RTE therefore instructed an Environmental Impact Assessment consultant and an agricultural and forestry expert to carry out a 2-stage environmental study:

- Initial pre-works report (2003-2004)
- A during- and post-works environmental study (2005-2006)

DESCRIPTION OF THE WORK SITE

The 63 kV line is 18.2 km long and passes entirely through rural areas, with no major railways or roads. Over half of its length crosses fields and meadows, and it also passes through streams, wet areas, hedges, stands of trees, Natura 2000 sites and other natural zones of national interest.
The construction works lasted from July 2004 to March 2005.

Laying method:

The two laying methods chosen for this project were:

- In rural areas where no specific type of feature had to be crossed, which was the case along the majority of the route, the cables were laid in HDPE (High Density PolyEthlyene) pipes placed directly into the ground;
- for crossing brooks, one large HDPE tube (Ecopal) containing groups of pipes was laid in order to reduce the time needed to be spent working in the area.

The cables were laid in sections of approximately 3 km using a new water bearing technique, and connected inside underground junction chambers
Along the route, the worksite covered a band of land approximately 12m wide (up to 15m in wet areas), and the width of the trench varied from 0.80m to 1.40m:

- traffic lane: 4/5m
- topsoil deposit: 2/3m
- deposit of matter removed from the trench: 3m
- trench and immediate area: 2m

ENVIRONMENTAL STUDY REQUIREMENTS

Points considered by the Environmental Impact Assessment consultant

Hydrology
A description of the aquatic environments was needed, mainly in the form of a biological inventory of the species directly affected by the work, as well as possibly an on-site measurement of the physico-chemical parameters (dissolved oxygen, temperature, conductivity and pH), both upstream and downstream of the crossing.

Pedology
A description of the soils and their behaviour was required. Aimed at studying the possible impact of the underground line, the main purpose of this description was to discover any changes in the flow of water through the soil.
The main factors taken into consideration when describing the soil units were:

- type of substrate,
- hydromorphism,
- the succession of soil horizons (strata),

In 2004, 1.2m boreholes were made at 100m intervals in order to obtain a soil profile for the whole of the route.

Vegetation
The study looked at different types of vegetation: wet meadows, sedge meadows, willow plantations, wooded slopes (border vegetation), embankment vegetation etc.