Electrically isolated tendons: Use in regions with stray currents and localization of short circuits to the reinforcement and of defects (AGB2001/481)

**Elektrisch isolierte Spannglieder: Einsatz in Gegenden mit Streuströmen und Lokalisierung von Kurzschlüssen und Fehlstellen**

**Funding:** National (Switzerland)
**Duration:** Dec 2001 - May 2005
**Status:** Complete with results

**Background & policy context:**

The use of electrically insulated tendons allows for a reliable and controllable protection against corrosion. Hence, a significant increase in the life time and an efficient determination of the actual state of the corrosion protection is possible. This protection is especially important when corrosion damage due to stray currents is possible. Criteria will be evaluated for the determination of the possible presence of stray current and the requirements for the insulation of the tendons. In most recent investigations an easy to use method for the determination of the quality of the insulation has been developed. In order to ensure a reliable protection of the tendons, not only the control of the insulation quality, but also the development of methods for the localization of the defects are required. This will be done based on the techniques used for detection of defects in coatings of cathodically protected pipeline systems. After establishing this technique it will be possible to repair the defects and guarantee a maximum corrosion protection of the system.

**Objectives:**

The technical knowledge required for the correct determination of possible corrosion problems due to stray currents is evaluated. These will allow the engineer to determine the requirements for the insulation of the tendons. Further, measures to mitigate possible induced AC voltages will be investigated. In the second part techniques will be established that allow determine the different defects in the insulation of the tendons. Hence, defective installation can be corrected and the required corrosion protection can be guaranteed.

**Methodology:**

In a first step assessment criteria regarding the use of the isolated tendons in the area of stray currents were developed. For this, a measurement method based on existing guidelines, theoretical calculations and field measurements was developed. In parallel to these operations laboratory tests were prepared for the development of detection methods for defects. Next a model tension cable was installed with artificial defects, to demonstrate the effectiveness of laboratory methods in the field on a structure. Finally, the developed methods were used in concrete structures.

**Parent Programmes:**

[ARAMIS - ARAMIS information system]

**Institute type:** Public institution
**Institute name:** Swiss Government: State Secretariat for Education and Research
**Funding type:** Public (national/regional/local)

**Partners:**

Switzerland
Swiss Federal Roads Office
**Organisation:** Schweizerische Gesellschaft für Korrosionsschutz

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**Key Results:**

Measurement method and evaluation criteria for the stray current threat of buildings in the planning stage and measurement methods for the detection of defects and short circuits.

**Documents:**

- Final report in German (Final report)

**STRIA Roadmaps:** Vehicle design and manufacturing

**Transport mode:** Road transport

**Transport sectors:** Passenger transport, Freight transport

**Geo-spatial type:** Other