



UNDERGROUND COMMUNICATION



Complex solution for the communication system at Harmanecká Cave

Harmanecká Cave is situated in the Kremnica Hills (in a boundary area with Veľká Fatra), 16 km north-west of Banská Bystrica, close to the village of Harmanec. It is on the north slope of Kotolnica hill, in the altitude of 828 m above sea level, about 260 m above the level of the Harmanec creek.

The entrance part of the cave called Izbica, by the local people, has been known since the beginning of time. M. Bacúrik dug through in other unknown spaces in 1932. Speleologists discovered the parts called Dóm Pagod and Riečisko (1938), Vysoký gotický dóm, Bludný dóm (1942) and the spaces behind Bludný dóm successively so that the total length of the cave is currently known as 2,763 m. A circular route with the length of 1,020 m is accessible for the public.

The cave was declared as a protected natural monument in 1968. This declaration was amended in 1972, and the cave has a statute of a national natural monument.

Need

Generally, CB radio was an original communication tool in the caves. However, walkie-talkies experienced problems with signal spreading with respect to a complicated character of the space, so that wire distribution lines and standard TDM telecommunication systems were installed later - around 1996. KX-T 61610 and KX-T30810 systems and, later, KX-TDA15 and KX-TDA30 systems with DECT KX-TDA0141 were integrated in to some caves. This solution was, much more effective than CB and, was able to cover the complicated shape of the caves. Harmanecká Cave was also in need of this solution, i.e. with KX-TDA30 service, plus DECT bases. The problems associated with the location of the caves in the landscape is reflected by the resistance to charge during storms. Some caves are more resistant than others. Service life or failure rate of especially base stations also depends on this. Harmanecká Cave is one of the caves where this problem is very significant.

New VoIP solution

A pilot project was commenced in 2016; optic cables were laid in the cave and the system was reconstructed to the KX-NS500 platform with use of the IP DECT KX-NS0154 base stations. The space was covered using seven KX-NS0154 units and eight repeaters. The devices were positioned in SCAM installation boxes in order to reach the required IP degree. Aerials were connected through grommets, while maintaining the IP degree and the range of the base stations. The guides and also the operators carrying out maintenance, inspections or investigations have been provided with effective information or security system which seems to be resistant to overvoltage events. This system saves above all service interventions and also components which had to be replaced after breakdowns. Similar solutions have already been installed in three caves.

Service contract

The company Telsys, the owner of which is engaged in speleology, actively provides service in several caves. With respect to the fact that the KX-NS500 system has been installed in Harmanecká Cave successfully, it is possible to implement remote control and monitoring after establishing the internet connection. The company can also guarantee availability of components for emergency situations handled in cooperation with the distributor, Mikrohuko s.r.o.

Possibilities of extension

The system can still be extended from the viewpoint of DECT signal spreading, so that there will not be any problems with availability in case of expansion of the spaces accessible for the public. Connection of SIP clients in the form of speakers is another possibility which has opened thanks to the new system; it is possible to install a suitable sound system in the underground spaces.