

Birds and Power Lines – status in the Slovak Republic

Michal Adamec

ABSTRACT

About 300,000 22kV electric poles are potentially fatal for birds in Slovakia. Based upon known electrocutions extrapolated to the length of lethal configurations, about 10,000 birds are electrocuted annually and this number may even be underestimated because many electrocuted birds are not found or are scavenged. There are three electrical companies in Slovakia. By Act No. 543/2002, owners of lines are responsible for preventing electrocution of birds. Owners must prevent electrocutions when building or reconstructing electric lines or when it is proven that birds are killed on poles. The State Nature Conservancy of the Slovak Republic is co-operating with electrical companies to make all lethal poles safe. Currently the State Nature Conservancy is using comb-blocks that are attached on the crossarm between the wires to prevent perching. There are two new types of design that will be used in the future for bird protection. In areas where there are rare nesting birds and the electrocution risk is high, the State Nature Conservancy is trying to persuade the electric companies to place the lines underground. Electric lines are permanently monitored by employees of the State Nature Conservancy and volunteers from nongovernmental organizations, mainly the Working Group for Research and Protection of Birds of Prey and Owls.

INTRODUCTION

There are about 300,000 22kV power poles that are potentially fatal to birds in Slovakia (Chavko pers. comm.). These 22kV electric lines are attractive to perching birds and approximately 10,000 birds are electrocuted annually (unpublished data, State Nature Conservancy). This was estimated by taking power line survey results from Hungary and the Czech Republic. Because the surveyed lines are similar to Slovakian power lines, the number of detected electrocutions was extrapolated to the number of kilometres of potentially lethal lines in Slovakia. This results in a number of 10,000–15,000 electrocuted birds annually in Slovakia. This number may be underestimated because many carcasses are either not found or scavenged before detection is possible.

TECHNICAL ISSUES

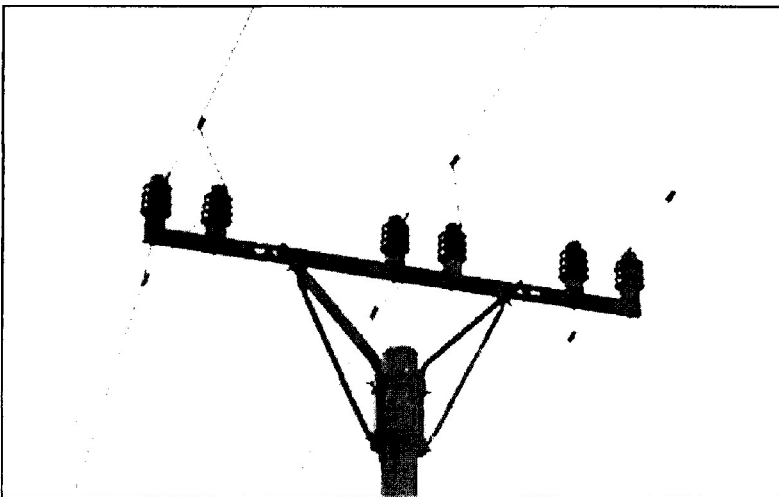
Electric lines are permanently monitored by employees of the State Nature Conservancy of the Slovak Republic (SNC) and volunteers from nongovernmental organizations (NGOs), mainly consisting of the Working Group for Research and Protection of Birds of Prey and Owls. Every detected electrocution is documented. Between 1 January 1996 and 31 December 2000 44 birds were brought to rehabilitation centres in Slovakia that were electrocuted but still alive (Table 1). Most of the birds were euthanized because of their severe injuries.

Table 1: Detected electrocutions from 1996 - 2000

Species	Number	%
<i>Accipiter gentilis</i>	3	6.8
<i>Aquila chrysaetos</i>	2	4.5
<i>Bubo bubo</i>	1	2.3
<i>Buteo buteo</i>	17	38.6
<i>Ciconia ciconia</i>	8	18.2
<i>Falco cherrug x peregrinus</i>	1	2.3
<i>Falco tinnunculus</i>	10	22.7
<i>Pernis apivorus</i>	1	2.3
<i>Strix aluco</i>	1	2.3

There are three electrical companies in Slovakia. They divide Slovakia into three parts - western, central and eastern. By legislative Act No. 543/2002, the owners of these power lines are responsible for preventing bird electrocutions. The owner must configure the lines to prevent electrocutions when building or reconstructing electric lines. They are also required to retrofit poles causing mortality.

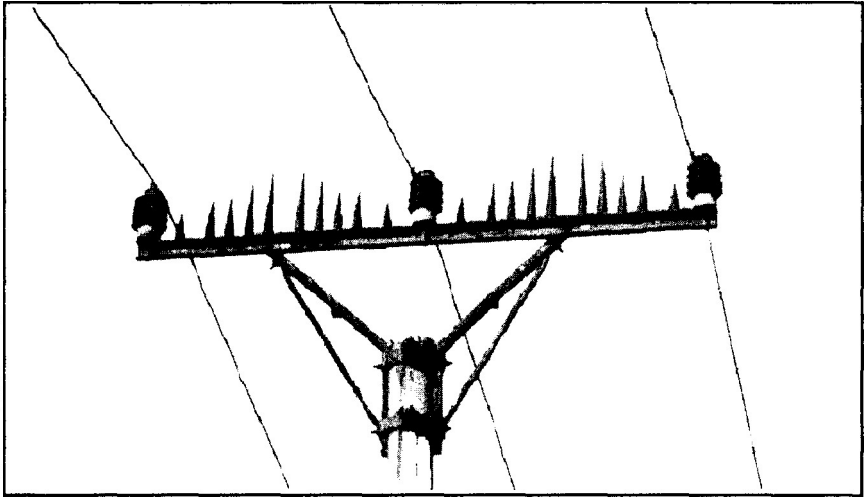
Figure1: 22kV pole fatal for birds



The most problematic configuration in Slovakia is constructed with three wires supported on a single metal-grounded crossarm (Figure 1). When a bird perches on this type of structure it can easily span two wires, resulting in an electrocution. Because the crossarm is grounded, simply touching one wire can also electrocute a bird.

To prevent electrocutions, SNC is co-operating with electrical companies to make all lethal poles safe. Currently SNC is recommending anti-perching comb-blocks between the wires to deter perching (Figure 2). However, attaching comb-blocks is only a short-term solution because these devices deteriorate quickly due to ultraviolet and weather exposure. After a few years these devices must be replaced with new blocks.

Figure 2: 22kV pole with comb-block anti-perching spikes



SOLUTIONS

A much better solution is simply to design new poles to be safe for birds. SNC proposes that new poles should employ alternative configurations, such as one used successfully in the United States for steel pole construction (Harness 2000). Safe perching can be accomplished by suspending two of the energized conductors under the crossarm, instead of supporting them on the arm (Figure 3). This requires suspension insulators and clamps instead of pin-type insulators. Suspending the conductors allows birds to perch on the crossarm without coming into close proximity to energized conductors. A pole-top cap must still be employed on the top of conductive poles to discourage perching. Suspending the insulators and conductors also will allow utilities to achieve the Raptor Research Foundation's recommended clearance of 60 inches (152cm) with shorter crossarms.

Another alternative is a structure used in Spain and France (Figure 4). It is important to note that these configurations should be constructed with nonconductive materials and clearances must be reviewed to insure that large perching birds can safely utilize these structures. The structure in Figure 4 should employ a perch deterrent under the centre phase. In Italy the FALCON™ tubular

“C” shaped pole-top unit has been successfully substituted for structures with pin-type insulators (Boschetti 2003) and should be considered in future bird-friendly designs (in conjunction with perch deterrents, if necessary).

Figure 3. Three-phase steel/concrete pole configuration framed with adequate raptor separation, 22kV

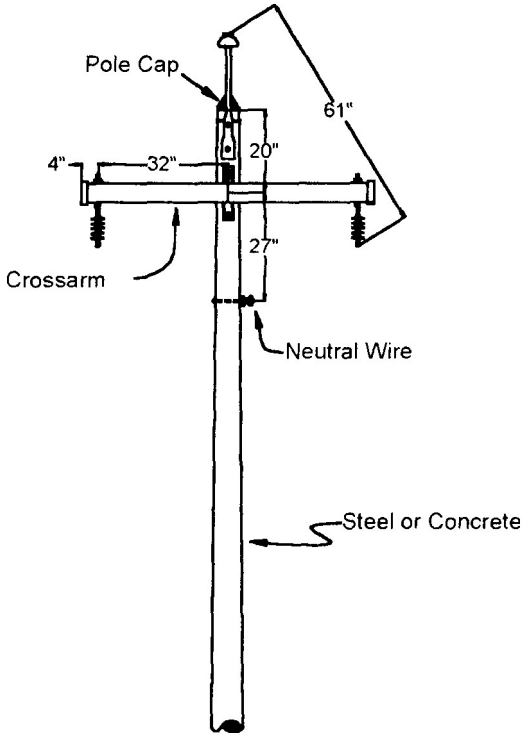
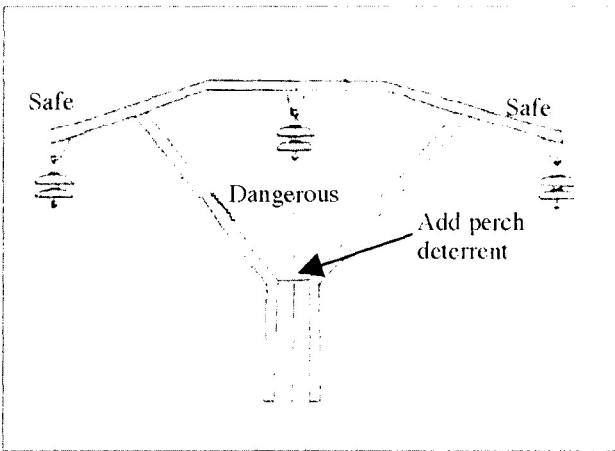


Figure 4. Spain/France configuration should be employed with a perch guard under the center phase



In the areas with nesting rare birds and a high incident of electrocutions, the lines should be placed underground.

CONCLUSIONS

Although there are laws to protect birds from electrocution, many structures annually kill birds. Present efforts to retrofit lines with anti-perching devices will not solve the problem because these products deteriorate and new lethal lines continue to be constructed. New constructions should be permanently altered to prevent further new problems. As poles need to be rebuilt, these too should be constructed in a bird-friendly manner. This will protect Slovakian birds while improving the reliability of the power grid by reducing costly animal-caused outages.

REFERENCES

- BOSCHETTI, M. 2003.** Conversion with live maintenance of the medium tension power lines (15kV) from rigid insulators into string insulators. IESMO 2003 Proceedings. IEEE Catalog Number 03CH37473 pages: 181-184.
- HARNES, R. 2000.** Raptor electrocutions and distribution pole types. North American Wood Pole Coalition October: 1-19. (<http://www.wwpinstitute.org/pdf/techbulletins/TechBulletin{IOct}00.pdf>) (6/14/01).
- OTAHAL, I., P. CMELIK, P. KRIZEK, J. PLESMIK & P. STYBLO 1997.** Ochrana ptáku pred zranením na venkovných elektrických vedeniach (metodická príručka CSOP c. 15). Ministerstvo životného prostredia ČR Praha & Základní organizace 70/2 CSOP Nový Jičín. Stanice pro záchranu Zivocichu v Bartosovicích na Morave. Nový Jičín, 44 pp.

Michal Adamec
State Nature Conservancy of Slovak Republic
Nature and Landscape Protection Center
Lazovná 10
974 01 Banská Bystrica, Slovakia,
E-mail: adamec@sopsr.sk