



Photo: NEEL Sp. z o.o.

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Railway protects animals

During the INNOTRANS 2010 fair, the Polish company NEEL will be presenting the world's most advanced system of protecting large mammals from collisions with fast trains, known as the „Animal Detering Device UOZ-1“. It is a completely innovative, even revolutionary, approach to the method of solving the problem.



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It's general principle of operation is that just before the train runs on the section of protected line, a brief emission of acoustic sequences is produced consisting of natural sounds which exist in nature, which for the animals represents a clear signal indicating approaching danger. The sounds used include the alarm calls of birds and barking dogs. Eminent specialists in the field of animal psychology were involved in creating the sequence constituting the so-called „key stimuli dummy“.

Key stimuli are signals triggering instinctive reactions in animals – even among individuals born in captivity. In the case of the UOZ-1, sounds inform animals of a potential life-threatening hazard, affecting their survival instinct. Animals respond to the signals with increased vigilance and anxiety. They stop their current activity and move away from the source of the signals, i.e. from tracks, at a safe distance (for example, hide behind the trees of the forest). Once the train passes and the emission ends, animals return to the vicinity of the track to continue grazing or cross to the other side of the tracks.

The source of the signals are devices, fitted with a special acoustic head capable of omni-directional sound emission, which are placed

directly by the railway track. They have the shape of a thermos flask of about 110 cm in height and a diameter of approximately 30 cm. They are mounted alternately on both sides of the track, within 70m of one another. Sequential emissions begin one minute before the train passes and end when the train passes each device. To control the devices information about positions of trains is used which is obtained from the automatic interlocking system and railway traffic control devices from the nearest stations. Work is underway on a UOZ version which does not require integration with the basic layer of railway automatic devices and which uses renewable energy to power the system.

The UOZ system has been working on the railways since winter 2003/2004. As for the version currently mounted on the upgraded railway lines E65 Warszawa – Gdańsk and E30 Legnica – Węgliniec – Zgorzelec, the system boasts the most advanced technology and reliability. A novel approach to the methodology of the system operation allows it to fully achieve the intended effect, i.e. a very high efficiency while minimizing the barrier effect and virtually zero habituation (the phenomenon of animals getting used to frequently repeated stimuli). Except for the moments immediately preceding the passage of the train, animals can freely cross the railway line. No decline in the effectiveness of the system with the passing years has been recorded either – animals born in the area where UOZ devices are used keep responding to signals.

Full confirmation of the effectiveness of the method was obtained during the course of several years of comprehensive testing of the equipment installed on the E20 line Minsk Mazowiecki – Siedlce, conducted by a research team from the Faculty of Forestry of SGGW, Warsaw. Video documentation provided by the cameras carrying out round-the-clock monitoring brought over a thousand registered cases of animal behaviour in response to UOZ signals and when the devices were silent. This represents a statistically reliable sample.

The system is very flexible and permits a wide range of adjustments. Amongst others, it is possible to match the type of sequences to the time of day or season, and to lower the volume at night.

Compared to traditional solutions, consisting of fencing off the railway line and the construction of special passes for large mammals, the system has an ecological and economic advantage. The installation cost of the UOZ-1 device is incomparably lower than the costs of constructing the so-called „green bridges“, i.e. the upper passages for animals. Above all, the animals can freely cross the railway line at any point, not only in locations designated by man, without causing habitat fragmentation.

The other aspect of animal protection issues is the problem of train traffic safety. The collision of a loco running at a high speed with a large and heavy mammal or hitting a gang of wild boars wandering on tracks can have very serious consequences. In recent years, a number of spectacular railway accidents occurred for exactly this reason.

In conclusion, the use of the UOZ system is the optimal solution to minimize the risk of wildlife collisions with trains on level terrain, at speeds of 160–200 km/h. The effect is a reduction in the loss of populations of large mammals and an improvement in the safety of train traffic.

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