

UOZ

Animal protection system for railway lines



History of the invention

It was mid-April 2003. In the compartment of an InterCity train there were two passengers: Jerzy Freliszka, of the Kolprojekt Project Office and Marek Stolarski, the head of the NEEL company in Warsaw.



The conversation was on the modernisation of the E20 railway line and the necessity of installing some system warning animals of approaching trains. The alternative was fencing the line and building an overpass for animals, which had not been included in the project documentation, or developing and applying a new solution that would meet the assumed functions and fit in the planned costs.

Jerzy Freliszka knew that NEEL used to deal with some “exotic” issues, for example development and implementation of greenhouse automation systems or microprocessor automation for small waste-water plants. Hence, the straightforward way to an affirmative answer to the question: “Will you take on developing such devices?” D. Sc. Mirosław Ryba, neuroscientist from the Polish Academy of Sciences and an avid hunter, played a very important role in the project, showing the correct way in the selection of the methodology of such devices and the other important person was Jerzy

Jakimowicz, who was then Deputy Sales Director in Bombardier (ZWUS) Polska Sp. z o. o., and who believed that NEEL were able solve such an unusual problem.

The team knew that they had to affect large mammals' senses in order to obtain a deterrent effect. In case of large mammals, the sense of sight and sense of touch are secondary. Most important is the sense of smell, but there were no odour generators that would be suitably efficient and precise. What remained was the sense of hearing, which gave a full range of technical possibilities.

At first, a lot of different sounds were purchased from the archives of the Polish Radio (barking dogs, shots, moving car, car horn, slamming doors, cough, etc.). Specialists from a well-known university were asked for help, but they told that it was impossible to make such devices.

The breakthrough came in the first half of June 2003 when the president of NEEL met professor Simona Kossak, Head of the Department of Natural Forests in the Forest Research Institute in Białowieża. She was one of the world's finest ethologists (specialists in animal psychology). At the first meeting she said simply: “I have been waiting for such a meeting for years. I have known for



long how such device should work, but I don't know how to produce them."

From that moment things went very quickly. It was still June when NEEL signed an agreement with Bombardier as a subcontractor under a contract for the modernisation of the E20 railway line, section Mińsk Mazowiecki – Siedlce. At the end of



July, after a very meticulous investigation on patent clearance, an invention was filed with the Patent Office and in September three copies of the pre-prototype device successfully passed the first tests in a forest near Warsaw. In frosty February 2004 the installation of first devices begun on the railway line. The total of 62 pieces were installed on a 50-kilometre stretch of the E20 railway line. 30 pieces were used to protect an area where the E20 railway line runs at the edge of a natural reserve "Broszkowskie Ponds" and the others were installed in 8 areas of intensive animal migration across the tracks. They were named UOZ-1 Animal Deterring Devices.

Every invention, especially if it is a novel solution, requires very reliable and sufficiently long scientific research conducted by independent institutions with unquestionable scientific achievements and experience in the subject matter under investigation.

Now was the time for film documentation of animal behaviour. Warsaw University of Life Sciences, Faculty of Forestry, Department of Forest Zoology and Wildlife Management is a place of work of researchers who, at the request of PKP PLK S. A., undertook a comprehensive monitoring

system for almost two years installed on the E20 line of devices.

Digital eye of "Big Brother" was observing the railway line for five years. Hundreds of hours of video recordings confirmed the validity of the method of deterrence, confirming the thesis that animals don't leave the railway tracks area, they willingly and quite often remain in the space between railway tracks and the edge of the forest as well as cross the tracks. In one of the videos you can see a roe deer family grazing on freshly mowed space between the tracks and the forest. The loudspeakers of UOZ devices utter sounds of animals fighting for their lives but the roe deer with its offspring are already at a safe distance. After a while the sound sequence ends, and you can see a passing train which plays the role of the culprit of the "sound massacre".

Another, perhaps the most important finding of the video recording analysis is that animals living in the area with UOZ-1 devices hadn't become accustomed to the deterring sound sequences repeated thousands of times. "Key stimuli" and migration routes are working all the time.

Next applications of the system were installed at the E65 line Warszawa – Gdańsk and at the E30 line. In November 2012 the system UOZ-1 was installed on two sections of the Russian Railways RZD: Moscow - St. Petersburg and St. Petersburg - Helsinki. And in 2018 preliminary tests of the system were conducted by Israel and Japanese Railways.





NEEL Sp. z o.o. ul. Piecuszka 1, 02-836 Warsaw, Poland
Phone: (+48 22) 649 56 30; 648 41 30; e-mail: neel@neel.com.pl, www.neel.com.pl