Design of a Weixin Service Platform for Bird Damage Early Warning in Power Grid

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Abstract. With the improvement of ecological environment and the expansion of the scale of power grid construction, "bird damage" has brought great hidden dangers to the safe and stable operation of power grid. On the one hand, human awareness of natural protection has been enhanced, the speed of bird reproduction has been accelerated, and the threat of birds to the line has gradually increased. On the other hand, bird damage prevention measures were not considered in the early design of power grid. Bird damage was prevalent in operation. After bird damage, the response measures were not timely, the treatment efficiency was low, and the number of line trips and non-outages increased. Especially in some backward areas, once the power grid loses contact with the provincial network, it will cause large-scale blackouts in the county (township) often occur, which directly affects the safe, stable and reliable operation of the power grid. It is urgent to prevent bird damage on the line.

Keywords: Bird Damage Early Warning; Smart Grid; Service Platform; Transportation and Inspection Risk Monitoring; Wechat Monitoring System.

1. Introduction
The situation of passive fault involving birds poses a great challenge to the Safe Operation of the power grid. In view of the impact of frequent bird damage on power security, how to change from passive preemptive to active defense, from post-analysis to ex-ante prediction, is one of the most critical issues we face. The development of Weixin Service platform for bird damage early warning in power network has positive and practical significance for reducing line trip, disaster, cost of bird damage treatment and efficiency of bird damage treatment. It will play a supporting role in protecting the safety of birds in the power grid, provide technical support for the decision-making of the power grid and the construction of the power grid, eliminate the disasters caused by birds in time and ensure the safe operation of the power grid. Power Grid bird-eye warning Wechat Service provides bird-eye prevention equipment and Power...
Grid bird-eye warning wechat service platform, through bird-eye data collection; Through supporting analysis and identification module analysis front-end birds and bird warning information; through supporting Wechat Processing Module real-time push to Wechat and system platform and intranet platform, staff on the timely detection of bird damage, according to the analysis of the strategy, send the corresponding level of instructions in time, through the eye of the birds to prevent bright light and strong sound to drive out the birds.

2. An anti-bird-eye device and power network bird-damage warning WECHAT SERVICE PLATFORM

Based on the terminal monitoring and ultrasonic and ultra-light integrated equipment; Internet of Things Control acousto-optic switch; wireless transmission equipment, wireless transmitter, wireless receiver; Intelligent Terminal Communication Equipment; It is used for data exchange and processing between intelligent terminal equipment and application analysis server, Early Warning System, etc. Data Acquisition Server, data acquisition and processing software, data acquisition database, the analysis and recognition software obtains the early warning information by the processing flow of data filtering, threshold calculation, video recognition, picture recognition, analysis and prediction, etc. Through the early warning trigger and Wechat and other means issued warning information, prompt the relevant personnel to deal with in a timely manner.

Figure 1. An anti-bird-eye device and power network bird-damage warning WECHAT SERVICE PLATFORM

Anti-bird's-eye set ultrasonic and ultra-strong light in one of the terminal equipment, through anti-bird's-eye device real-time acquisition of power grid surrounding situation;
1) When the analysis and recognition module analyzes the birds close to the line or the key part of the tower;
2) The early warning application module notifies the out-going staff in real time through wechat and transmits the bird harm information to the intranet staff;
3) According to the level of the warning, the staff of Wechat who received the bird-harm information sent the corresponding level of photoacoustic command to the bird-eye protection equipment, and the bird-eye protection issued the corresponding level of strong light or strong sound to drive away the birds that would harm the power grid birds;
4) After the birds fly away, the system will be real-time transmission of security information to wechat staff and intranet staff;
5) The analysis and identification module will sum up this information as a case of bird damage, for the subsequent construction and development of the power grid reference.

3. The equipment based on Terminal Monitoring, ultrasonic wave and ultra-strong Light

Based on the equipment integrated with Terminal Monitoring, ultrasonic and ultra-strong light, the early warning information is obtained by the data filtering, threshold calculation, video recognition, picture
recognition, analysis and prediction processing flow of the bird-eye Prevention Terminal Through the early warning trigger and Wechat and other means issued warning information, prompt the relevant personnel to deal with in a timely manner.

4. Bird Eye Protection

1) Bird-eye protection consists of a 360-degree rotating camera, a 360-degree rotating ultrasonic wave and a 720-degree ultra-light rotating device

2) 360 degree rotating camera: It is used to monitor the activity of birds in real time. When it is found that birds appear or fall onto the power grid equipment, the diagnostic analysis module in the background will make timely judgments and determine the impact level of birds. Then send ultra-bright light or ultrasonic command to drive away birds;

3) 360 degrees rotation ultrasound: When received the bird impact level command, will automatically start the corresponding level of ultrasound, drive birds;

4) 720-degree ultra-strong light rotation: When received bird impact level command, will automatically activate the corresponding level of ultra-strong light, drive birds.

5. Summary and outlook

Based on the terminal monitoring and ultrasonic and ultra-strong light integrated equipment; networked control acousto-optic Switch; wireless transmission quipment, wireless transmitter, wireless receiver; Intelligent Terminal Communication quipment; It is used for data exchange and processing between intelligent terminal equipment and application analysis server, early warning system, etc. Data Acquisition Server, data acquisition and processing software, data acquisition database, the analysis and recognition software obtains the early warning information by the processing flow of data filtering, threshold calculation, video recognition, picture recognition, analysis and prediction, etc. Through the
early warning trigger and Wechat and other means issued warning information, prompt the relevant personnel to deal with in a timely manner. The research in this paper plays a supporting role in protecting the safety of birds in power grids, providing technical support for the prevention of birds in power grids, decision-making on power grids production and construction of power grids, eliminating the disasters caused by birds in time, and ensuring the safe operation of power grids. Can also be used in aviation, railway, agriculture and other fields, with a strong practical, economic and promotional.

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