

## Study Committee B2

OVERHEAD LINES

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### Experience Use of Bird Protection Devices on Power Lines and Environmental Impacts

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#### Motivation

- Since the year 2010 beginning, the idea have to be prepared equipment with special devices to provide bird protection known for a long time, but the lines of PJSC "FGC UES" have used a point wise today.
- The main cause of death of birds from electric shock. Birds of prey are most often electrocuted on power lines due to a collision with a power line.
- According to statistics, disconnections of power lines for reasons related to the bird streamers are the fourth most important factor of outages in electric networks.

#### Method/Approach

- The research method in the performance of the organization – analysis of practical approaches to the Use of Bird Protection Devices , as well as the identification of methodical maintenance service activities and the development of recommendations for improvement of the environmental impacts, technological innovation (innovation aspects).

#### Experimental setup & test results

The transmission lines faults caused by birds have the following characteristics:

- Time and season of the faults;
- Environment around the towers;
- Type of towers and insulators;
- Flashover and burns characteristics of the faults.

#### Discussion

- The economic efficiency calculation of the bird protection devices is carried out. An assessment of the probable damage to the animal world in the design of power supply systems is made and at the same time the ecological and economic effect of the implementation of bird protection measures is estimated.

#### Objects of investigation

- bird protection devices;
- power lines;
- environmental impacts.

#### Conclusion

- Research shows that the probability of bird droppings flashover on transmission lines in the insulator-centered circle is significantly different. In the design of the size of the insulator bird protection shield, the opening angle of the bird thorn and the installation position of the spacer, it is necessary to ensure the full coverage of the high-incidence area and strive for the best bird repelling effect of bird protection devices.
- Strengthen the basis of line operation and maintenance, improve the supervision and assessment mechanism, and train the basic skills of line safe operation. Eliminate some employees' misconception that bird related outage is a natural disaster and bird damage can not be prevented.



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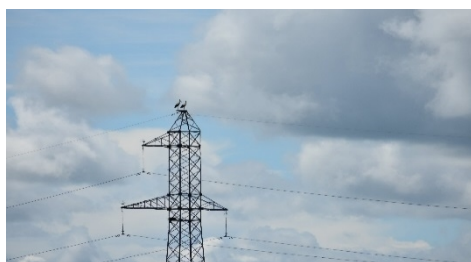
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continued

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#### Analysis of 35 kV and 110 kV outages

| Year | 35 kV                     |                                |        | 110 kV                    |                                |        |
|------|---------------------------|--------------------------------|--------|---------------------------|--------------------------------|--------|
|      | Total number of shutdowns | Shutdowns due to bird exposure |        | Total number of shutdowns | Shutdowns due to bird exposure |        |
| 2019 | 2                         | 1                              | 50 %   | 41                        | 17                             | 41,5 % |
| 2020 | 4                         | 3                              | 75 %   | 23                        | 2                              | 8,7 %  |
| 2021 | 3                         | 2                              | 66,6 % | 3                         | 3                              | 100 %  |



#### What was done in FGC

Statistically, every fifth disturbance of operating regime on Russian power transmission lines is bird-related. Large bird species such as Oriental stork are in a high risk group. The only possible solution for their protection is the mounting of anti-landing devices and safe platforms for nests. This equipment is mounted on 52 out of 59 main transmission lines within the Oriental stork home range. The storks build nests and bring out chicks on specially mounted safe platforms. The reasons that have the greatest impact on the number of overhead line failures have identified and the main ways to improve the reliability of overhead lines have proposed. The policy pursued by the Federal Grid Company has shown that the use of bird protection devices has a positive effect on the environmental component and increases the reliability of power supply to consumers and reduces the percentage of bird deaths from electric shock and nesting on the traverse of supports, forcing them to look for familiar nesting sites, such as clearings and forest belts.