

Smart Inspection-UAV Application

I. Abstract

Through the downsizing of electronic instruments in recent years and the rapid development of communication technology, the unmanned aerial vehicle (UAV, as called drone) is developed as light-weight and high-mobility carrier, which has gradually matured. Therefore, Power Supply Department of TPC tried to use drone to assist the inspection work, and successfully found the accident location of the tower on the river bed. As the technology became more mature, the works of the tower foundation monitoring, line inspection, finding accident location, and tower corrosion investigation are implemented. Especially the extreme climatic in recent year, there's more nature disasters. After wind, rainstorms or road landslides, vehicles could not be reached, so the location of accidents on transmission line were found with assistance of drones. In addition, the types of occupational disasters for overhead transmission line operations are mainly "falling" and "inductive". With the assistance of the drones, this type of disasters can also be reduced.

II. Smart Inspection

A. The line inspection: from "point" to "space"

In traditional inspections, labors walk along the path to ensure the safety of the transmission line. If the road is interrupted due to natural disasters or the tower is located on the river, the advantage of drone can overcome the obstacles of the terrain and confirm the line immediately, and the safety of power supply is ensured.

B. The line inspection: from "traditional manpower" to "stereo images"

In the inspection work, people can only rely on personnel to climb up on the support to work, but personnel inspection will have visual blind spot, which may weaken the transmission line. Through drones, people can observe at 360 degrees, so that the weakness may be reduced. Also, the data collected by drones for building data database, and introduce of artificial intelligence can improve the quality of line

inspections

III. Conclusion

Due to the rapid development of information in recent years, the transmission of messages requires fast and accuracy. Traditional line inspection is often limited by terrain, environment factor and etc. By the assistant of drones for line inspection, the efficiency and effectiveness of inspection can be improved, also it can improve the quality of inspections. The use of drones to assist inspections can protect personnel from tower inspections when unnecessary, reducing the occurrence of occupational disasters such as "falling" and "inductive electricity".

"Smart inspection" is the future and ongoing type of transmission line inspection. The complete fleet management and operation manpower training establishes the foundation. New technologies are successively introduced to make the inspections more accurate and reliable, and the weaknesses can be detected efficiently to improve stability of power supply.