

### 特高压输电

## 直升机在特高压交流输电线路巡视中的应用

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#### 摘要:

特高压交流输电线路铁塔高、相间距大等特点给人工巡视带来一定困难, 为此研究了特高压输电线路直升机巡线技术的方法、手段、项目、悬停位置、巡视安全性等技术难题, 分析了特高压电磁场强度对直升机的影响。结合长南一线、南荆一线的直升机巡视实践, 认为特高压输电线路直升机巡线技术是安全的、有效的。

**关键词:** 特高压输电线路 直升机巡线 电场强度

## Application of Helicopter Patrol Technology in UHVAC Transmission Line

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#### Abstract:

The features of UHV transmission line, such as high tower and large spacer, bring many difficulties to manual patrol. So the key technology of helicopter patrol for UHV transmission lines has been researched, such as patrol method, inspect means, partol item, inspect palce and security problem, and the effect of electric-field intensity to the helicopter by the emulation has also checked. Combined with the helicopter hot lines patrol practicable work on the chang-nan 1 line and the nan-jing 1 line, the whole work has proved the effectiveness and security of this way once more.

**Keywords:** UHV transmission lines helicopter patrol electric-field intensity

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#### 参考文献:

- [1] Tosato F, Quaia S. Reducing voltage sags through fault current limitation[J]. IEEE Trans on Power Delivery, 2001, 16(1): 12-17. [1] 于德明, 沈建, 汪骏, 等. 直升机在电网运行维护中的研究与应用[J]. 电网技术, 2009, 33(6): 107-112. Yu Deming, Shen Jian, Wang Jun, et al. Research and application of helicopter in patrol and hotline operating maintenance of power lines [J]. Power System Technoly, 2009, 33(6): 107-112(in Chiese).
- [2] 邵允临, 曹晋恩, 尚大伟. 直升机巡检华北电网超高压输电线路[J]. 中国电力, 2003, 36(7): 35-38. Shao Yunlin, Cao Jin'en, Shang Dawei. Patrol inspection of EHV electric power transmission line with helicopter in North China Power Network[J]. Electric Power, 2003, 36(7): 35-38 (in Chinese).
- [3] 林志和. 超高压输电线路采用直升机巡线的探讨[J]. 福建电力与电工, 2004, 24(4): 16-18. Lin Zhihe. The discuss of EHV electric power transmission line helicopter patrol inspection[J]. Fujian Power and Electrical Engineering, 2004, 24(4): 16-18(in Chinese).
- [4] 邱国新. 在直升飞机上应用红外热像技术巡视检测高压输电线路设备的回顾[J]. 广东电力, 2005, 18(3): 71-73. Qiu Guoxin. Review on using infrared thermal imaging technique on helicopters to inspect equipments of HV transmission lines [J]. Guangdong Electric Power, 2005, 18(3): 71-73(in Chinese).
- [5] 张柯, 周朝阳, 李海峰, 等. 直升机作业在我国特高压电网中的应用前景分析[J]. 河南电力, 2006, 34(1): 18-19. Zhang Ke, Zhou Zhaoyang, Li Haifeng, et al. Analysis on helicopter patrol application arospect in China's UHV grid[J]. Henan Electric Power, 2006, 34(1): 18-19(in Chinese).

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[6] 赵彦平, 李丽. 直升飞机巡视检测高压输电线路[J]. 山西电力, 2006(S1): 39-42. Zhao Yanping, Li Li. Helicopter surveying supper voltage transmission lines[J]. Shanxi Electric Power, 2006(S1): 39-42 (in Chinese). [7] 张柯, 李海峰, 王伟. 浅议直升机作业在我国特高压电网中的应用[J]. 高电压技术, 2006, 32(6): 45-46. Zhang Ke, Li Haifeng, Wang Wei. Analysis of helicopter patrol application prospect in China's UHV grid[J]. High Voltage Engineering, 2006, 32(6): 45-46(in Chinese). [8] 张吴明, 杨又华. 机载多角度多光谱成像技术在电力系统中的应用[J]. 华中电力, 2006, 19(6): 1-2. Zhang Wuming, Yang Youhua. Application of airborne multiangular and multispectral imaging system in power system[J]. Central China Electric Power, 2006, 19(6): 1-2(in Chinese). [9] 李国兴. 我国直升机电力作业的现状与发展[J]. 电力设备, 2006, 7(3): 41-45. Li Guoxing. Present situation and development of helicopter power job in China[J]. Electrical Equipment, 2006, 7(3): 41-45(in Chinese). [10] 汪骏, 沈建, 陈方东, 等. 直升机水冲洗带电超高压输电线路绝缘子[J]. 电力建设, 2007, 28(7): 36-39. Wang Jun, Shen Jian, Chen Fangdong, et al. Live EHV transmission line insulator flush using helicopter[J]. Electric Power Construction, 2007, 28(7): 36-39(in Chinese). [11] 尚大伟. 华北电网直升机电力作业的现状与发展[J]. 电力设备, 2007, 8(4): 33-35. Shang Dawei. Present situation and development of power job with helicopter in North China power grid[J]. Electric Equipment, 2007, 8(4): 33-35(in Chinese). [12] 陈勇, 万启发, 谷莉莉, 等. 关于我国特高压导线和杆塔结构的探讨[J]. 高电压技术, 2004, 30(6): 38-41. Chen Yong, Wan Qifa, Gu Lili, et al. Discussions on UHV conductors and tower structure in China[J]. High Voltage Engineering, 2004, 30(6): 38-41(in Chinese). [13] 郑晓广, 李君章. 特高压线路铁塔几种组立施工方法[J]. 电力建设, 2009, 30(4): 39-43. Zheng Xiaoguang, Li Junzhang. Several UHV tower assembly and erection methods[J]. Electric Power Construction, 2009, 30(4): 39-43(in Chinese). [14] 刘振亚. 特高压电网[M]. 北京: 中国经济出版社, 2005. [15] 国际非电离辐射防护委员会. 限制时变电场、磁场和电磁场 (300 GHz及以下)曝露导则[S]. ICNIRP, 1998.

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1. 薛士敏 贺家李 李永丽 .特高压输电线路分布电容对负序方向纵联保护的影响[J]. 电网技术, 2008,32(17): 94-97
2. 曾庆禹.特高压输电线路电气和电晕特性研究[J]. 电网技术, 2007,31(19): 1-8
3. 黄道春|阮江军|文 武|李昊星|赵全江|郑 伟.特高压交流输电线路电磁环境研究[J]. 电网技术, 2007,31(1): 6-11
4. 曾庆禹 .特高压输电线路地面最大工频电场强度和导线最大弧垂特性[J]. 电网技术, 2008,32(6): 1-7
5. 杨 勇|鞠 勇|陆家榆|雷银照 .极导线垂直和水平排列±500 kV直流输电线路的电磁环境比较分析[J]. 电网技术, 2008,32(6): 71-75
6. 刘兴发|干喆渊|张小武|张广洲|万保权|郭 雄.交流特高压输电线路对航空无线电导航台站的有源干扰计算[J]. 电网技术, 2008,32(2): 6-8
7. 干喆渊|张小武|张广洲|万保权|郭 雄|周文俊.特高压输电线路对调幅广播电台站的无源干扰[J]. 电网技术, 2008,32(2): 9-12
8. 卢铁兵|冯 晗|崔 翔.基于上流有限元法对高压直流输电线路下合成电场的研究[J]. 电网技术, 2008,32(2): 13-16
9. 邵方殷.1000 kV特高压输电线路的电磁环境[J]. 电网技术, 2007,31(22): 1-6
10. 杨 光|吕英华.交流特高压输电线路无线电干扰特性[J]. 电网技术, 2008,32(2): 26-28
11. 王 毅|孙成秋|汤 涛|郎需军|罗栋梁.不同运行方式下特高压直流输电线路的地面电场与离子流分布[J]. 电网技术, 2008,32(2): 29-33