

Risks Management for Warning of Power Grid

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Abstract. Brought about rapid development of the power grid technical innovation, infrastructure and new equipment put into operation significantly increase the workload, frequent changes in network operation mode, non-normal operation mode, special operation mode is difficult to avoid, to the security and stability poses a threat. According to the actual operation of Luoyang grid to grid operation of risk management for the background, grid management risk warning were analyzed and discussed.

1. Introduction

With the rapid economic development, the rapid increase in the size of Luoyang grid. Currently there are 500 kV grid Luoyang line 18, line 67 220 kV, 110 kV line 153, with 110 substations 137 kV and above, as of the end of 2015, the maximum load has exceeded 6.1 million kilowatts, becoming the Henan grid second breakthrough 6.1 million kilowatts of power Supply Company.

The rapid development of social economy brings increasing grid size. Grid technical innovation, infrastructure and new equipment put into operation significantly increase the workload, the number of planned outage at all levels, job difficulty and operational risks are increasing, frequent changes in network operation mode, non-normal operation mode, special operation mode is difficult to avoid the grid structure running increasingly large and complex, to the security and stability brought great threat to the power service has brought unprecedented challenges to destabilize the power grid and the risk of blackouts is always present. For this reason, risk management and control grid work in highlighting the increasingly important power supply enterprises.

2. Risk Management for Warning of The Power Grid

In 2009, the company began actively promoting grid management risk early warning and control system elements to carry out combing the requirements of the existing regulations, unveiled a "risk Luoyang risk classification grid warning management approach", "Luoyang power company risk warning notice implementation of process control implementation details" and other work standards. In recent years through constant practice and summary form a grid of risk assessment, publish, control, closed-loop management feedback mechanisms.

After several years of operation of the grid system of risk management, employee risk awareness has been greatly improved, the power grid risks are well controlled, basically to ensure safe and stable operation under abnormal operating mode and a special operating mode for reliable power users, but in the implementation process, there are still many problems:

Power grid planning and construction of power grids risk result response lag. Power grid planning and construction of the project is subject to - feasibility study - preliminary design - design - construction tender - construction and other sectors, due to the long construction period, and there are many uncertainties in the construction process, leading to the risk of the wire grid changed, single-supply terminal substation "flawed" not been able to eliminate.

Risk Warning various departments involved in grid initiative is not enough. Grid current assessment of risk analysis - warning issued - Risk Control - a closed-loop feedback control management is responsible for leading a Safety Supervision Department, other departments with the implementation. The degree of active participation is not enough office property of their respective

departments, the process is not clear, the standard is not standardized, risk assessment analysis is not in place, pre-control measures implemented, feedback loop is not smooth, risk control grid is not ideal, it cannot meet the current security and stability operation claim.

The existing power grid risk control methods cannot meet the "three five" systems work requirements. "Electrical safety and accident investigation and handling of emergency regulations" (599 orders), the new "State Grid Corporation of safety accident investigation procedures," has implemented, the risk of power grid in the subdivision, more stringent assessment, to the power grid bring greater pressure assessment. In particular, "three five" since the implementation of the system, standardization of professional management, intensive, requires increasingly higher flat grid operation mode changed greatly, the current risk warning grid management approach has not adapted the new power production safety situation work demands, control risk warning grid work needs to be improved.

As users continue to improve power supply reliability requirements, especially municipal government approved one, two important customers, such as coal mines, chemical industry, hospitals, railways, etc., if an exception because grid run way, reduce the user's reliable power users and even cause power outages, public opinion will lead to significant, adverse impact on the image of the national grid, causing negative social impacts and immeasurable loss. In view of the above problems, the regulation department from 2011 began warning of the risk of a closed loop power grid control; standardize its processes and standards, tentative grid value greater risk for a number of risk control work changes, worked out a better and more effective risk control methods grid. The following 220 kV line towards razed, Haiyi line, II seaward line power with a variable power supply strengthen the work week, for example, judged from a risk warning, release, perform, feedback and other aspects of detail.

3. Specific Circumstances in Risk Management for Warning of The Power Grid

220 kV line towards razed, Haiyi line, II seaward line power with a variable power supply strengthen the work week, at the same time on both sides of the line and work equipment faults elimination.

220 kilovolt Begonia change (main supply), Yi Qi variable power scope covers the whole territory of Yanshi county-level city, there are 10 110 kV substations and one to transfer power plants, power load 280MW, the power supply for about 160,000 users.

Overhaul before operation: 220 kV line towards the barbarians, Haiyi line, II seaward line rings run with Begonia change, Yi Qi variable load; 1,2 partial sea line parallel operation with polysilicon change, partial-bridge, fragrant # 1 main transformer load; Yan Hai lines - Pan Yan line - English Pan wire ring run with Yanshi change, Pan Tun change, business has changed, Aviva variable load; 2 sea line breakdown Gou Gou's variable load zone; Resources Power lines are incorporated by 1,2-Run Yan Begonia system.

Control center prepared in accordance with risk assessment grid risk warning notice, published by the operation and maintenance unit to the global system through office automation, safety supervision department, marketing department, rural power co countersigned red grid risk warning notice approved by the leadership of the company, notice contains a "risk assessment analysis", "power run risk", "Grid secondary operational risks", "Risk control measures" and other aspects.

Good grid control center operation mode of arrangement under maintenance mode, relay protection and automatic device adjustments, accounting protection under special operating mode setting, avoiding maintenance mode n-1 fault accident resulting in a large grid, arrange power equipment on schedule to carry out maintenance work. Begonia become due before the overhaul for load is bigger than Yanshi City power grid load of 80%, as the risk of downgrade: 220 kV were organized Chaoyang change, the goal becomes part load transfer with Yanshi; Yanshi load will be divided into three power Point power, try to arrange power supply load balance sheet per region to ensure that the load carried by each power supply point does not exceed 40% of the total load of Yanshi grid to avoid accidents in general and over the grid. Thus ensuring any equipment failure, will

not lead to a greater and general grid accidents, arrangements will risk rating downgraded from the grid operation mode.

Transmission equipment maintenance department transport inspection room, Yanshi power company, power company Mengjin coalition cities, counties, joint working group to tertiary care line, strengthen within the scope of line maintenance of special patrol, caretakers work, it is important to take lots of squatting measures ensure power supply line safety and stable operation during equipment maintenance. City and county levels control center organized a special joint anti-accident exercises, strengthen risk awareness departments, emergency departments should dispose of a comprehensive test capability to ensure that when the accident occurred under maintenance mode correctly, rapid response to minimize the effects of the accident to a minimum.

Ministry of Construction to do the preparatory work construction, good control during construction work to ensure the project was completed on schedule quality and quantity; operation and maintenance department, safety supervision department and other organizations to oversee the implementation of the various sectors of risk control measures, and on-site supervision of risk pre-control implementation; rural power, marketing guidance and urge the relevant departments under the early warning risk analysis grid carding important, sensitive customer electrical safety risks; supervise the implementation of important user security emergency preparedness and emergency power supply preventive measures; organizations to implement an orderly use electricity supply services and other control measures, good client guaranteed power supply.

Before scheduling an execution date of approval of the plan before the working day 18:00, the relevant departments will implement control measures risk warning preparedness feedback to regulatory departments to implement all the measures in place behind the scheduled execution scheduling. End equipment maintenance work, the risk of releasing the grid after each team will risk the implementation of measures to control center feedback from the control center to save the archive.

4. Suggestions for Risk Management for Warning of The Power Grid

Risk Warning grid control center administered by the lead organization, control center mode according to schedule maintenance plan, carding safe operation of power risk, the preparation of the appropriate level of risk warning and released, the equipment maintenance department to implement the appropriate preventive measures based on risk early warning requirements, according to ask for feedback implementation. Control center responsible for the overall arrangements for the main distribution network maintenance scheduling, familiar with the production sector of business, control of the whole company production resources, to understand the specific circumstances of the power grid, power grid control measures proposed risk warning more realistic, executable and strong, workable , the deployment of various departments easier.

Marketing and strictly implement a closed-loop risk warning regulations, based on "State Grid Henan Electric Power Company to further strengthen the power grid risk warning notice" and "Henan Electric Power Company important customer management approach" requirements, according to "inform, report, service Steering "four in place of work principles and develop important specific users and dual power user supply risk warning informed the management approach, important, specific users and dual power user rating control standard, important user power supply Risk Warning Notification of a unified requirements standardize the supply risk warning to inform the user workflow, identify important users, specific users and dual power supply users risk warning monitoring measures.

5. Summary

In recent years, the power grid by early warning of risks of exploration, combined with the practical problems encountered in implementation and to seek solutions, combined with the State Grid Corporation, the provincial power grid company risk early warning management requirements continue to increase standards of work, planned for the end of 2015 revising introduction of "risk warning Luoyang grid management practices", which covers the risk classification, the respective

risk level approval process, the relevant departments duties and assessment criteria. Grid risk like the air everywhere, risk control grid is a long-term task. With the development of the grid, users are increasingly demanding high-reliability power supply; power management control risk warning has become increasingly important. We believe that through the joint efforts of all staff of the power grid risk will be able to get better and more effective control.

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