Research on urban distribution automation construction and renovation project

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Abstract: Urban Distribution Automation is a necessary requirement for power grid development. The article describes a network frame, Automation Master station, Feeder automation “” Distribution Communication network construction and change making principles, features, Method, measures, to develop a construction planning goal.

Keywords: City ; Distribution Automation ; Building and rebuilding

Automatic identification of distribution system faults by distribution automation, from Dynamic Quarantine failure, auto-Power, increases power reliability and user satisfaction. town [] distribution Automation is the trend and requirement of power industry, is also a power supply enterprise The only way to show. Distribution automation construction and transformation including a grid transformation, from Dynamic Main Station transformation, Feeder Automation construction and distribution communication network transformation.

1. One-time grid construction and transformation

One-time grid transformation scheme mainly includes the optimization of the line truss structure, Line Negative Load adjustment and Transformation, single radiation line hand in hand transform, optimize the power supply area, Solution on-line power supply radius is too long, ribbon blending capacity larger, heavy line load, Sub load unreasonable, not implemented N-1 " " question. According to city once grid status in accordance with the target grid transformation requirements, under normal power distribution lines should meet "N -1 ", Guidelines, require power distribution when adding and receiving load Line load distribution balance, grid structure unchanged, Contact and paragraph is optimal status; for not meeting "N 1 " line for grid adjustment, Perfect Contact, and form single Contact, Two contact or tri-Connection mode .the Main Line should have a 1~3 automatic segment switch to divide lines into 2~4 Segment, should optimize point of contact unreasonable, segment points not set up and uneven load distribution Ring line, make each segment load Balancing. for cannot implement " three remote " General node switch devices for features, To achieve a range of blackout scope management, should be retained or adjusted to other lines.

2. Automation main station construction and transformation

Automation Master Station system construction should follow the standard, Reliability, universality, extensibility, security, reliability, availability, technical principles such as maintainability. superscript compliance requirements Follow relevant domestic and foreign standards, System Adaptive device uniform naming and editing Code requirements, all interfaces with standard design etc. Reliability Requirements Guarantee Data security, Important Data backup, Redundant server switching guarantees no information

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loss, System can separate left out and features are not affected by a single failure, system all hardware devices conform to modern Industrial Standard, system easy Backup and recovery. commonality requirements System has open Department architecture, provides an open environment, supports multiple hardware platforms, Handy now interfaces with other systems. Extensibility Requirements Capacity, node, features extensible, Meet the requirements of various data management business development. Security Requirements meet The relevant provisions of the distribution network from the the security protection of the dynamic system, Data Privacy, System builds special fire Wall, maintain a relatively independent relationship with other power monitoring systems, Implementing host consolidation, Antivirus illegal intrusion, etc. maintainability requirements System all devices conform to Hyundai International standard, With graphic Library integration Technology, supports Third-party software development, system with easy to use diagnostic tools, and so on.

3. Feeder Automation Construction and Transformation

Feeder automation through the Distribution Automation terminal (DTU or FTU) implementation Monitor distribution line running status monitoring, combined with urban distribution network architecture and load weight to degree analysis, feeder automation generally take four options: First is main Station set type transform main network in feeder automation, Implement line reason Disabled auto-position, Automatic Quarantine, Fault analysis judgment and non-faulty zone recovery; two is with a voltage - times or voltage - Current Type fragment to distance Remote non-main network lines in city center retrofit, implement Fault in-place automatic Quarantine; The third is the use of automatic separation of user fault demarcation switch to the user side of the change build, The involves the primary network in case of a failure. Four is for a cable or overhead line that does not have a modification condition, can install the fault indicator, is installed on the line fault indicator to detect fault current and determine wiring failure, Reuse Pass the letter unit passes the fault information far to the distribution Automation master to determine the area where the failure occurred.

Fields and Types

with Centralized Feeder Automation As an example, Centralized feeder from Move all network failures must be handled by the primary station, to reach the fault area segment isolation and failure section Power recovery target. Its work process master receives distribution terminals monitored failure warning, combined with switch-gate, Switch Station and The protection actions of substations and other information to make a comprehensive judgment of the failure, and then issue a point order. For example a city feeder F1 with feeder F2 through contact switch (L0800) contact, Two line feeder all aerial cable mixed line, :

when A When a point fails, Wire break CB1 detects a failure after the break, main Station received fault message or detected CB1 Switch Modification, passed with feeder F1 Other Distribution Terminal Communications, Comprehensive analysis of location information for switches, and then fail-lock on CB1 and FTU1, To issue a separate lock command, FTU1 The switch disconnects the, L-0800 Contact switch closing, Isolate the failure and restore power to the non-faulted sector. same as, when ,after failure locating B point failure, paragraph switch FTU1 Gate, to up to the purpose of the quarantine failure.

4. Distribution Communication network construction and transformation

Distribution Communication network construction and transformation should pay attention to three construction and transformation principles:

4.1

The communication system follows the grid company's automation of medium and low voltage distribution networks Security protection for systems, Guarantee transmitted data security.

4.2

To save on construction costs, the uses a for the lines that have been configured for fibre communication Line Communication transmission, for non-configured optical communication lines should be in GPRS Technical Wireless
public communication mode.

4.3

Use wireless communication to achieve information between the master station and remote monitoring interaction. In the construction of city distribution network, using advanced communication devices, to passive optical network primary, Wireless Communication as a supplement Distribution Communication access network, makes the wireless communication network safe and efficient.

References