Research on urban distribution automation construction and renovation project

Lianglili

Guangdong Power Grid Co., Ltd. zhaoqing Sihui Bureau , Guangdong zhaoqing 526200

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 loadunreasonable , 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

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

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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 CB 1 detects a failure after the break , main Station received fault message or detected CB1 Switch Modification , passed with feeder F 1 Other Distribution Terminal Communications , Comprehensive analysis of location information for switches , and then fail-lock on CB1 and FTU 1 , To issue a separate lock command , FTU 1 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 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 ,main construction GPRS Wireless public communication network complex , 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

1. Gou , Shovu , Chen , , and so on . A practical f feeder Single-phase grounding fault section locating and isolating methods [J]. Power system automatic 2006,29:79-81.
2. Chen Jian . Distribution Automation Master Station system Research [D]. Shandong Big Learn , 2006.
3. Dou Haodong . Network Automation Communication Technology analysis and research [/J]. China New Communication , 2013,15:16-17.