

Research of IP Based Multimedia Communication System Used for Combined Anti-accident Maneuver

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Abstract

The Combined anti-accident Maneuver is used to imitate accidents occurred in power production and heighten ability of members dealing with them, so through which we can find the hidden unsafe factors in production. Firstly, the framework and structure of combined anti-accident maneuver are introduced, and then problems exist in traditional communication system used for accident maneuver are also pointed out. In order to overcome these problems, it gives a new solution, with which not only voice but also video can be applied for maneuver members, as a result the availability and veracity are improved much more.

Keywords: Communication, multimedia, anti-accident, IP

1 INTRODUCTION

The Combined anti-accident maneuver is an important way to ensure security for power production. Accident in power production has the characters with salvo, fast and catastrophic, so how to insulate exception fleetly, prevent accidents from spreading, restore systems to run again and ensure the reliability of power supply become an important task to research. The anti-accident maneuver can improve capability of dispatch members, heighten ability of operators to resolve accidents. So by this way we can find problems existed in power system.

As an important part of anti-accident maneuver, communication system can provide info transmission so as to facilitate the maneuver to perform effectively. So it is of great signality to research high performance communication system for the maneuver.

2 FRAMEWORK AND STRUCTURE OF COMBINED ANTI-ACCIDENT MANEUVER

The traditional combined anti-accident maneuver^[4] system adopt one to one module, which means the directors send dispatch commands to actors who act as operators in reality. Having received commands the actors should deal with the accidents correspondingly. This kind of module is valued of simple, utilitarian but also limited. At the end of 1990s, with new hyper-voltage and big-content equipments being widely used, the grid expanded constantly. Accidents happened

in one substation will impact others inevitably. As a result, it is necessary to dispatch members to know about the whole power system, they cannot just care for their own substation so as to neglect the influence to the others. In order to adapt to the transformation, the national grid dispatch center with presidial dispatch centers in provinces are exploring a new way of anti-accident maneuver that is named as combined anti-accident maneuver. This combined system can integrate all of the substations with advanced communication system, which broke down the old concept. By the way of combined anti-accident maneuver, the operators will have a comprehensive understanding to accidents happened in power system, it will help them to settle trouble timely.

All of people participated in maneuver can be divided into three groups: director, actor and monitor as described in Figure 1. Directors used to set malfunctions, collaborate for super intendants and take charge of all actors. When malfunctions have been set, actors should settle them in time and report the results to directors. Monitors usually supervise directors and actors during maneuver and evaluate the validity of maneuver.

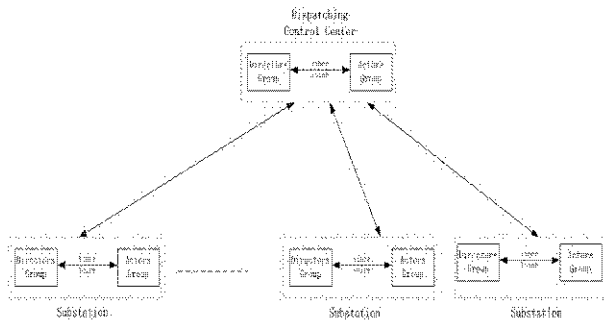


Figure 1. Framework of anti-accidents maneuver

3 TRADITIONAL COMMUNICATION SYSTEM USED FOR MANUEVER

At present, communication system used for maneuver is based of old telephone dispatch system. This system mostly provide voice communication service which use Client/Server mode based PBX^[1]. The infrastructure of this communication system is illustrated in figure 2. CTI Server is the key equipment that connect the dispatch board and switches, however dispatch board cannot communicate with PBX directly, the information should be transferred by CTI server. The link protocol

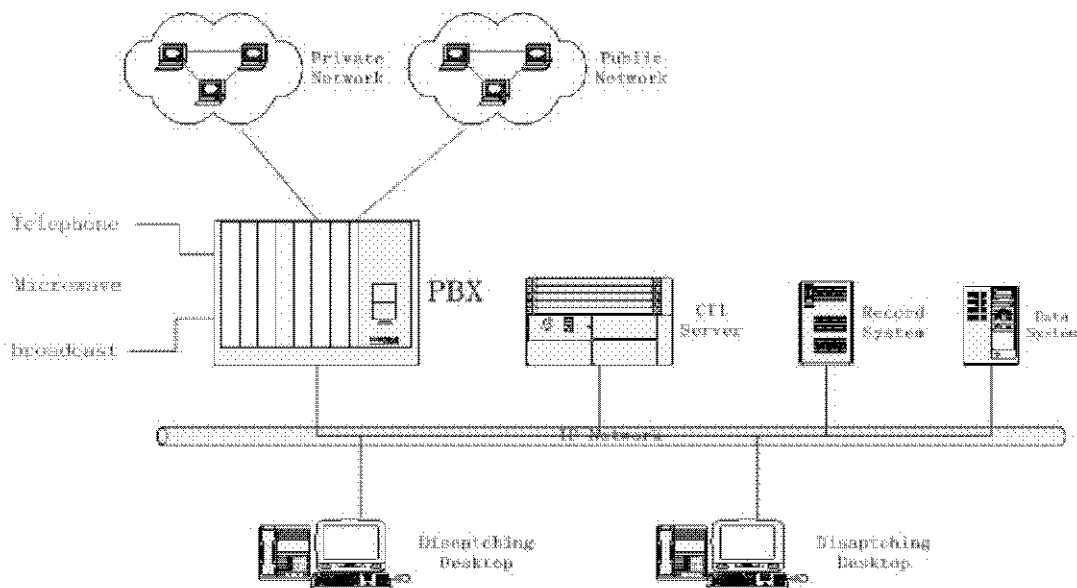


Figure 2. Existing IP based communication network

4 IP BASED MULTIMEDIA COMMUNICATION SYSTEM

Power communication network is one of the most three important elements for power system to run safely and stably, which is an important fundamental establishment of power system. Power communication system have such characteristics as high reliability, less mass of information, complex and multiple types

is different according with different manufacturers of PBX.

For most enterprises this dispatch telephone system had been running for several years which can only provide voice service, and resource is limited. So traditional voice service cannot meet the need with grid combined anti-accident maneuver, it is strongly recommended that video, voice, image, data e.g. multimedia service can be applied for maneuver. Although we can rebuild and update the old dispatch communication system, it will become more complicated, less reliable and need more extra investment, but the most important is that the system has no potentiality to development for a long run. So it is necessary to research a new type of dispatch system for grid combined anti-accident maneuver to substitute for the old. This new communication system should use existing networks to supply for transmitting digital information such as video, voice and so on, so dispatch members can monitor all the scenes easily with the help of it.

of information, strictly real time, complex configuration of network, a large range of communication, more depopulated department and so on. Traditional power communication system does not meet with the development of power system because of its complex network infrastructure, limited services that can be provided and simple network management system.

After several years construction of communication network in power system, IP network has been built in most of areas of china., at the same time most departments of power companies have strong interests in transporting voice, video, data via simple IP network, and in some developed areas many companies have deployed productions based IP. So it is of great value to research multimedia communication system^[3] based IP network that used in power system, especially multimedia power dispatch system

Multimedia dispatch communication system is based on softswitch technology and accorded with standard H323 protocol^[2]. It can meet the needs of written

board, shared applications, voice, video, multimedia meeting, TV conference e.g. services. Figure 3 shows the framework which is composed of Gatekeeper, Gateway, IDD (Intelligent Dispatching Desk) , IP-Phone, MCU, DRS (Digital Recorder System) , VS (Video Server) , Leader desktop、Common desktop. All devices including terminals are connected by IP network. Gatekeeper is the key elements, which takes on processing the call and channel signals, managing and controlling the whole system. Gateway, as an entity of system, used to connect with traditional PSTN/SCN networks. IDD is a operation panel for dispatch personnel. DRS used to record voice or video communication information among dispatch members. MCU provides conference controls for all of terminals.

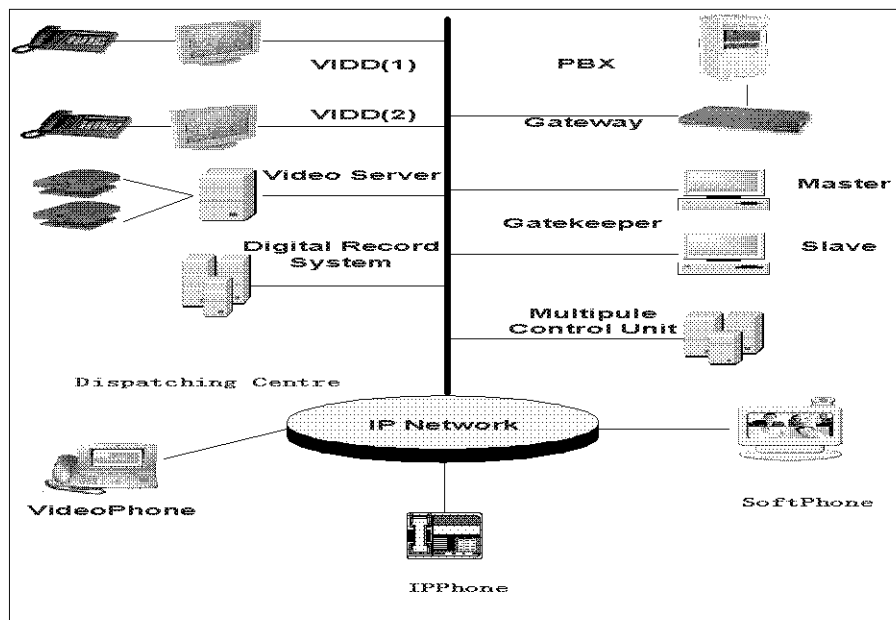


Figure 3. New IP based communication network

5 APPLICATION OF MULTIMEDIA COMMUNICATION SYSTEM IN MANEUVER

Combined anti-accident maneuver is made up of four departments: dispatch control center, drillmaster desk, monitor desk and substation. In order to meet the need of combined anti-accident maneuver, dispatch desktop, monitor desktop and web server should be extra added on multimedia communication system. Such equipments as gatekeeper, gateway, VIDD: Video Intelligent Dispatching Desk, MCU: multiple control

unit, DRS: Digital Recorder System, VS: Video Server and web server are installed in dispatch control center. By VTD(video training desk) drillmasters could view all the scenes of substations, also they could give commands to make known to lower levels. Members in monitor room could visit the maneuver through software that installed in computers. Figure 4 shows the infrastructure of this system used for combined anti-accident maneuver.

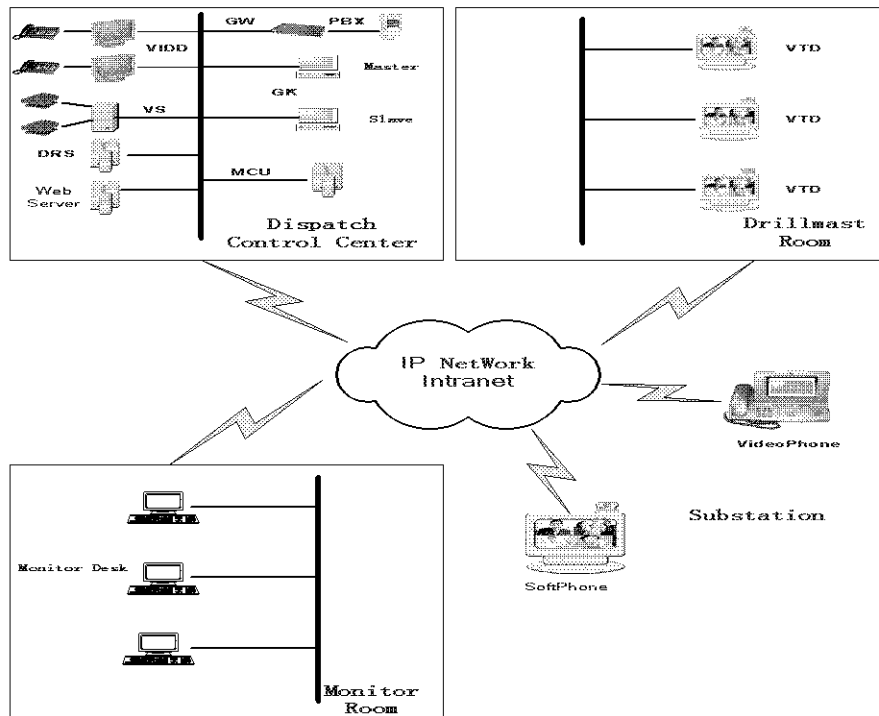


Figure 4. Multimedia anti-accident maneuver system

6 FUNCTIONS AND ADVANTAGES

The whole communication system can be provided with such functions and advantages as follows:

Real time communication with voice and video information

Digital record system: all of communication information can be recorded according time segment that selected or set.

Connect with MIS system: all the users can view anti-accident using web explorer.

Multiple modes used for making calls: dispatch members can make a call by IP telephone or pushing buttons.

As a result, this system take full advantage of IP network resource to provide a new dispatch way for anti-accident maneuver.

7 CONCLUSION

In order to settle the problem that only simple voice service can be supplied for the old communication system, this document introduce a new project to provide multimedia information for dispatch members of power system. Now this new project has successfully applied in Henan province, China. By this means we can perform combined anti-accident maneuver to heighten the capability and ability of dispatch members, as a result the trouble is overcome completely and we

received a good compliment.

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