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SECURITY DEVELOPMENT

Currently, the rapid development of digital technologies has brought profound changes to the human society, along with increasing security risks caused by new technologies and new scenes. Demands for network security risk monitoring and handling, data security and compliance, and personal information protection are rapidly upgrading. China Telecom firmly fulfils its missions and responsibilities in building Cyberpower and Digital China as well as maintaining network and information security, continues to strengthen security system, and incorporates security development in the entire process of its production and operation in all areas, and builds a digital information infrastructure security barrier, so as to constantly improve the security capability of digital environment and provide customers with high-quality security products and services.

SECURITY DEVELOPMENT

MAINTAINING NETWORK AND INFORMATION SECURITY

The Company has strictly implemented the requirements of the *Network Security Law of the People's Republic of China* and the *Regulations on the Security Protection of Key Information Infrastructure*, performed its major responsibility as a key information infrastructure operator, systematically strengthened the key infrastructure protection capability, consolidated network and information security management work, and enhanced the security protection and governance capabilities on all fronts. We have improved systems and mechanisms by revising the *Measures for Security Management of Assets Exposed to Internet* and the *Measures for Vulnerability Management*, and formulating the *Measures for Security Management of Software Research and Development* and the *Measures for Commercial Password Management*, and implemented the construction of the management mechanism in network and information security to clarify responsibility for cyber security. We have enhanced the security capability system integrating cloud, network, edge and terminal and launched a security capability pool of 186 nodes covering 150 key cities across China, with an anti-distributed denial of service attack (DDoS) capability of 13.68 Tbps, maintaining its position in the first-tier camp in PRC. We also established cyberspace mapping capabilities and threat intelligence sharing and alert mechanisms, which significantly enhanced the detection, analysis and disposal capabilities of security incidents. The capability of dial-testing illegal and undesirable information was increased by 40.74%, and in-time response rate reached 100%.

The Company proactively implemented the requirements of laws and regulations including the *Data Security Law of the People's Republic of China*, the *Personal Information Protection Law of the People's Republic of China* and other laws and regulations, and revised the *Administrative Measures of China Telecom on Data Security* and the *Administrative Measures of China Telecom on the Protection of Personal Information of Users* and other systems to ensure the security of personal information and data. The data security situational awareness platform was built to achieve full coverage of key data security capabilities of the information system of Graded Protection level II and above, and the data security risk assessment has been fully completed. We strengthened the user supervision mechanism by establishing personal information protection person-in-charge mailbox to smooth out channels for complaints and reports. We continued to carry out governance on illegal collection and use of personal information by apps, strictly followed the minimum, reasonable and necessary principles, and clearly informed the collection and use of personal information in the privacy policy and obtained consent of users.

【Data security situational awareness platform】

The Company's proprietary data security situational awareness platform gathers important data assets, perceives data security risk, generate insights regarding risk situation, builds a secure, intelligent, collaborative and operational internal data security protection brain, and comprehensively improves data security perception capabilities. The platform has been selected into the 2024 "List of Typical Cases of Data Security in Industry and Information Technology Area" by the Ministry of Industry and Information Technology.

PROVIDING SECURITY SERVICES

The Company focused on the network and information security R&D chain, strove for breakthroughs in key technologies and continued to build an integrated end-to-end collaborative security protection system. It has developed security capabilities and services in 7 major categories and more than 50 subdivisions around key products such as Anti-DDoS Cloud Dam and Security Brain. The market shares of anti-distributed denial of service (DDoS) remained the first in PRC and was selected in the Gartner report; while the share of Website Security Experts ranked second, and the Security Brain has served tens of thousands of customers in education, government administration, finance, healthcare and other industries. Yunmai (雲脈) SASE products are the first to obtain the excellence level of zero trust capability maturity evaluation and zero trust application maturity evaluation of CAICT. We launched the Jianwei (見微) large security model and built the industry's first operator-level managed security service platform, providing managed security services for more than 100,000 government and enterprise clients.

【Building a managed security service platform at the operator level】

At the 2023 Digital Technology Ecology Conference, the "security cabin" debuted and showcased the operator-level managed security service platform (MSSP) in all directions in the form of cinema visit.

We have launched Security Butler service for household customers focusing on household broadband security protection. For self-run cooperation websites and other related content, we make review before publication to strive to create a clean cyberspace. We carry out cyber security publicity week activities and conduct welfare publicity via multiple channels and in multiple forms, to popularise network information security, personal information protection, prevention and management of communication network fraud and other security knowledge, constantly enhance people's security awareness, create an atmosphere that everyone knows security and everyone enjoys security.

【Trusted Communications 3.0】

Trusted Communications is a security product that reshapes the new communications trust relationship. As a key application of digital identity in the communications field, it helps solve the social governance problem of harassing calls and fraudulent calls, and has been widely used in banks, financial regulatory agencies, government service hotlines and other industries.

Trusted Communications 3.0 derives a variety of products based on secure business secret foundation and open ecology and forms systematic operation services gradually. On technology side, the trusted identity issued by the electronic authentication agency is introduced, and the national secret algorithm is applied to encrypt identity and information end-to-end in the communications process to ensure the security and credibility of the caller information. On product form side, diversified products, including Trusted Communications APP, trusted SIM card, trusted customised mobile phone, trusted intelligent fixed-phone, trusted gateway and other products are launched through the open and trusted ecology.

We have built the Hefei Quantum Metropolitan Network, which is the world's largest in scale with the largest number of users and the most complete applications, and released the "Tianyan" quantum computing cloud platform. We have independently developed products such as Quantum Security Service Platform and Quantum-encrypted Messages, and initially formed a rich cryptographic security product system and feasible diversified key infrastructure cryptographic transformation solution. e-Surfing Quantum-encrypted Calls obtained the highest level of "excellence" in the security capability assessment of CAICT.

【Officially launching the "Forging Shields Action 2.0" to make quantum security within reach】

In November 2023, during the Digital Technology Ecology Conference, The Company's Quantum Group officially launched "Forging Shield Action 2.0", including four new security products, namely Quantum Security Cloud, Quantum Security OTN, Quantum-encrypted Messages and Quantum Cryptographic Solution.

Quantum Security Cloud: Reinforcing the base of China Telecom National Cloud with quantum security and confidentiality technology to enhance the anti-quantum computing attack capability of the cloud platform and create an integrated end-to-end quantum security cloud protection system with "in-cloud, on-cloud and inter-cloud (入雲+雲上+雲間)".

Quantum Security OTN: Building the industry's first OTN premium optical network security foundation with quantum + national cryptography technology based on China Telecom's OTN superior optical network and quantum cryptography technology with core capabilities of super security, super-large capacity and ultra-high performance.

Quantum-encrypted Messages: Enriching instant communications, secure office and other functions to provide more systematic mobile secure office services based on Quantum-encrypted Calls.

Quantum Cryptographic Solution: Combining quantum security technology with commercial cryptographic technology to provide users with anti-quantum cryptographic services in line with national cryptography standards and specifications, and to create quantum cryptographic solutions with quantum key as the core for key infrastructure application scenes.

ASSURING EMERGENCY COMMUNICATIONS

The Company faithfully fulfilled its mission of ensuring secured and smooth communications, made every effort to fight against natural disasters such as earthquakes, typhoons, floods, landslides and provided communications assurance for major activities. We provided communications assurance for flood control and disaster relief in Beijing and Hebei, communications assurance for flood and typhoon relief in Fujian, Liaoning, Guangdong, Guangxi, Heilongjiang and other provinces, and for the Jishishan earthquake in Gansu. The Company focused on key regions and coordinated the whole network, and coordinated online and offline to successfully complete communications assurance work for 9 major events including the Asian Games Hangzhou, the Chengdu Universiade, the first "China + Five Central Asian Countries" Summit, the "Belt and Road" Forum for International Cooperation, and escorting the return and landing of the Shenzhou XVI manned space spacecraft. In 2023, more than 760,000 person-times, 130,000 vehicle-times and 70,000 set-times of communications equipment were dispatched for emergency communications.

【Successful completion of the communications assurance task for the 19th Asian Games Hangzhou】

In order to provide communications support for the Asian Games, the Company mobilised 33 emergency communications vehicles and 96 emergency support team members from 29 provinces (autonomous regions and municipalities) to Zhejiang, while arranging technical experts from Cloud Company, Security Company, Digital Intelligence Company, Digital Life Company, and Best Tone Company and other professional companies to provide on-site and remote support.

Zhejiang branch and other branches involved in the Asia Games have set up an assurance leading group headed by the "master leader" and special working groups on communications assurance as well as network and information security, to establish a flat command and dispatching system with rapid response and penetration into the front line. From 16 September to 8 October 2023, the number of support personnel and support vehicles dispatched by Zhejiang branch reached 100,026 person-times and 6,516 vehicle-times respectively. Other emergency equipment were also dispatched, with the total number of power generators and satellite phones reaching to 273 and 2,403 unit-times respectively. Assurance was provided through all time for 5,301 events in 54 competition venues as well as other key areas including 30 non-competition venues, 31 training venues and 20 reception hotels.

【Gathering the elite forces of all provinces to assure the communications lifeline, command line and support line in the disaster areas】

In July 2023, under the influence of super typhoon DokSuri, Beijing, Hebei, Heilongjiang, Jilin, Tianjin and other places were hit by heavy rain, and the flood control situation was severe, and communications was blocked. The Company responded quickly to the flood by actively carrying out rescue and relief, such as selecting elites quickly to help the affected areas and quickly assembling elite forces to fight for flood control and communications assurance.

The total number of support personnel, emergency vehicles, unmanned drones (tethered), power generators and satellite phones dispatched by the Company reached 39,467 person-times, 9,830 vehicle-times, 43 unit-times, 3,041 unit-times and 3,095 respectively. And the number of emergency text messages sent reached 144.33 million.

The Company has achieved breakthroughs in the technical problems of "multi-mode for aerial-ground, low power consumption and miniaturisation" of terminals in cooperation with industry partners, and provides users with all-region, all-dimension and all-business ubiquitous services through the strengthened integration and complementarity of application scenes such as mobile phones with direct satellite connection and aerial-ground integrated IoT, to effectively satisfy user's needs in emergency scenes.

【The global debut of the "Mobile Phones with Direct Satellite Connection" business】

How to communicate with the outside world in deep mountains and dense forests, the desert, the mountains and valleys, the islands and oceans, or the earthquake rescue site has always been a difficult problem in the communications community.

The Company has carried out key problems solving and integrated innovations in active cooperation with upstream and downstream industrial chain, and achieved breakthroughs in four key technologies, namely optimisation of system standard protocol design, miniaturisation of satellite radio frequency base band chip, built-in high-gain antenna, and integrated automatic control of network resources.

In September 2023, the Company officially launched the "Mobile Phones with Direct Satellite Connection Service" with 13 invention patents generated and was awarded the 2023 Top Ten Super Projects of Central SOEs by the SASAC, and selected as one of the Top Ten PRC Sci-tech News of CCTV.

STRENGTHENING PRODUCTION SAFETY

The Company conscientiously and strictly implemented the *Production Safety Law of the People's Republic of China* and other relevant laws and regulations on production safety to clarify production safety responsibility, improved the relevant system and mechanism by revising the *Measures for the Administration of Production Safety* and formulating the production safety management evaluation and assessment accountability, communications construction engineering production safety management and other internal systems, to further standardise the comprehensive management and appraisal of production safety, strengthen engineering construction safety management and safety supervision of outsourcers and subcontractors. We carried out safety management enhancement yearly action and dedicated investigation and rectification actions for major accident hazards, and strengthened accident hazard analysis and notification as well as safety risk warning, to improve the education, training and team construction with a focus on improving employees' overall risk awareness and the bottom line mindset capability. We promoted digitalisation of production safety management and comprehensively prevented and addressed major risks to ensure life and property safety of our employees.

Clarification of Safety Production Responsibility

- We signed Production Safety Responsibility Letter with companies at provincial levels and promoted each unit at all levels to sign the responsibility letter. We also established the "responsibility undertaking and guarantee system (包保責任制)" for outsourcers and subcontractors to clarify their safety supervision responsibility.
- We strengthened the assessment of safety responsibility, and seriously held accountability for the units and personnel who failed to fulfil their safety responsibility.

Potential Hazard Investigation and Remediation

- We carried out investigation and rectification of potential hazards by organising all units to continuously investigating and rectifying such hazards, so as to improve potential hazard ledger, and implement all closed-loop rectification.
- We incorporated the information of all buildings and building leaders into the system management, and carried out investigation and rectification of potential hazard for building fire safety on a regular basis.
- We set up a hotline for reporting potential hazard on production safety and provided 7×24 hours acceptance service. We also carried out potential hazard identification activity, with nearly 40,000 employees participating, and offering cash awards of more than RMB1.56 million.

Inspection, Supervision and Warning Notification

- The main persons-in-charge of the Company took the lead in carrying out the inspection and supervision of production safety in important periods such as holidays, national "two sessions" and major state events and prompted the leaders of all units and at all levels to check and manage safety, and implementing various initiatives for production safety with a rigorous work style.
- We set up a production safety inspection team of 100 people and carried out monthly inspection and supervision. A total of 212 inspection teams were dispatched throughout the year to carry out safety inspection on 444 prefecture-level branches, and closed-loop rectification was carried out for all potential hazard found.
- The production safety and safety inspection situation were regularly reported to promote the closed-loop rectification of problems and potential hazards. Production safety accident case warning and safety risk warning were carried out to urge and guide units at all levels to draw lessons from cases, implement all kinds of safety prevention measures for dangerous operations, and ensure production safety.

Education, Training and Team Building

- Production safety teleconference and safety risk warning education conference were held to enhance risk awareness and bottom line thinking ability.
- Publicity and education activities on production safety were carried out for all employees, and more than 400,000 employees participated in dedicated study and training.
- A series of "Production Safety Month" activities, such as finding potential hazards, safety publicity and consultation days, knowledge competitions, emergency trainings and drills were carried out to create a sound safety atmosphere of "everyone pays attention to safety and everyone can handle emergency".
- Production safety and labour competition were organised for quantitatively scoring the attendance of production safety work and activities, such as the production safety team building, potential hazard investigation and rectification, publicity, education and trainings, knowledge competitions, warning education and emergency drills, and selecting the winning units and outstanding individuals.

Digital Construction

- We continuously improved and optimise our building fire safety management system.
- We continued to promote "fire safety cloud" construction.