

## Research on Information Security Internal Control Mechanism of Intelligent Electric Grid

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**Abstract.** As the foundation of intelligent electric grid safe and stable operation, information security involves every node of electric information systems which are difficult to manage and have a large number of users. It is important that how to promote the level of information security internal control. This paper started with strengthening the foundation management, established a sound information security working mechanism, strengthened information security talent team construction, promoted security supervision and inspection mechanism, strengthened the business authorization and account number authority basic management, promoted the security equipment operation level, reinforced the development and application of the instruments and advanced technology, established the “attack-defense-supervise” cooperation mechanism, explored the electric information security management process and measures. All of these methods lifted the risk prevention consciousness and ability of information security talent team, constructed a more standardized information security control process, reduced the failure rate substantially of information system, promoted the overall level of information network performance and operation.

### Introduction

With the rapid development of intelligent grid and new energy, the electrical infrastructure and industry has experienced enormous changes. At the same time, the new information technology and application such as large data, cloud computing, mobile internet, broad band wireless have brought the new challenges. Because of the more professional external attack methods and the threat from user side and terminal equipment, the traditional protective structure and system have faced new challenges. Information security has become a basic factor to determine whether the intelligent grid can operate stable and safely, how to promote the ability of information security internal control has become an extremely important thing in the electric grid informational work[1][2]. This paper will start with strengthening the foundation management, establish a sound information security working mechanism, strengthened information security talent team construction, promote security supervision and inspection mechanism, strengthen the business authorization and account number authority basic management, promote the security equipment operation level, reinforce the development and application of the instruments and advanced technology, establish the “attack-defense-supervise” cooperation mechanism, explore the electric information security management process and measures, ensure the information security internal work implement effectively.

### Optimize Information Security Work System, Regulate Internal Control Work Mechanism

According to the information security working requirements, Henan company has optimized and adjusted the working mode, decomposed and implemented the indexes, ensured the related work are executed properly. On the basis of analysis on the information system operation security situation and carding the weak link of information security, Henan company has developed the information security evaluation index system and adjusted the evaluation index automatically. Publish the discovered information security issues and supervise the rectification situation. On the basis of the

information security evaluation index system of state grid company, there are some additionally qualitative or quantitative indexes such as “attack-defense team” comprehensive evaluation index, safe operation typical experience, unified data protection mounting yield and so on to strengthen the examination of the basic units information security working situation. Evaluate the peccancy events through publishing the information security notification [3]. At the same time, bring the evaluation index system into information security normal supervision to ensure the related work can be carried out. The information security basic management index system as is shown in Grid 1.

Grid 1.The information security basic management index system

Serial number	The name of index	The content of index	Target value
1	The number of unsafe operation events of account and authority	Count the number of unsafe operation events which are caused by account, authority, password.	0
2	The intact rate of account record	The intact rate of account record=the number of accurate account/the total number of accounts*100%	99.9%
3	The responsibility designated rate	The responsibility designated rate=the number of designated accounts/the total number of accpunts *100%	99.9%
4	The weak password	The weak password of operation and maintenance accounts	0
5	The normative of account management	Whether the setting of account and authority according with the related regulation of the state grid company	YES
6	The normative of the firewall strategy	Whether the authority of the firewall strategy is minimization	YES
7	The timeliness of the governance of the vulnerability	Whether the governance of the vulnerability is not in time. Whether conduct the verification.	YES
8	The comprehensive evaluation of the defense team	Whether the defense team carry out the work follow the regulation of the state grid company.	YES
9	The comprehensive evaluation of the attack team	Whether the defense team carry out the work follow the regulation of the state grid company.	YES

At the same time, the information security internal control works need more attention and support from the related leaders and departments. Henan company has established information security work leading group that is responsible for the whole information security management. The information and communication company is responsible for the defense team and the maintenance work. As the supervise subject, the electric power research institute is responsible for the vulnerability test and security supervision. During the establishment of the “attack-defense team”, Henan company has strengthen the construction of security team through absorbing the excellent talents, technology communication and so on. At present, Henan company has formed an effective human resource guarantee frame to ensure the lasting political stability of information security work, which is shown as Figure 1.

### Hackle the Work Standardize System, Regular Information Security Work Process

To ensure the work implement effectively, it is necessary to hackle the information security work process. Aiming at the information security basic work, regulate the work process and specification of keeping the information security records , business authorization and permission, account number approval, hidden danger and leakage investigation and rectification, firework strategy approval, operation security audition, information system online security test. These methods can not only strengthen the closed loop management and process tracking, but also promote the level of

internal control management. In 2017, the internal control basic work such as information security operation and maintenance, hierarchy protection evaluation, risk evaluation, information system upline test, business authorization and permission, account number authority security carry out orderly, “operation & maintenance” team and “attack-defense-supervise” team work together coordinated, form an aggregated power of information security.

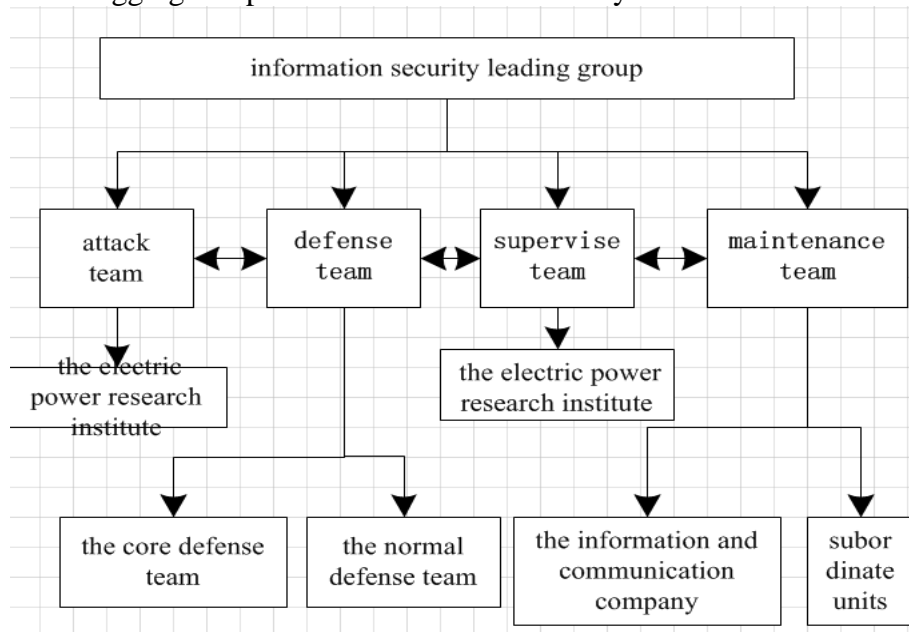


Figure 1. The information security management system

### Pay Attention to Talent Cultivation and Technical Research, Construct Cooperation Mechanism

Pay high attention to information security talent cultivation, evaluate the ability of talent team through theory and practice. Invite veteran experts to conduct technology exchange, participate the in-turn communication of “attack-defense-supervise” team. Rely on the established information security attack-defense laboratory, locate knowledge blind spot of the talent team through theoretical exam and actual operating. Revise the training program, improve the quality of talent team, solidify the security foundation[4]. Through the concentrated training for “attack-defense-supervise” team to extend the knowledge scope of the talent team, improve the attack-defense technology level, provide the skill reserves for the joint development of security defense and hidden danger governance. Carry out the core team member rotation mechanism, aiming at the leakage, weak password and configuration problems of information system and network equipment to conduct remote penetration, rectification and reinforcement. Through the method of “teach-help-guide”, reduce the technical gap of talent team, improve the technical level of information security team. Under this talent cultivation mode, an effective joint defense mechanism would be formed.

Face to the frequent information security vulnerabilities and threats, Henan company strengthen the development of security tools and application of new technology, discover and repair the hidden danger in time. As a normal work, the hidden danger investigation, rectification, validation and verification take up plenty of time of defense team and maintenance staffs. Combined with practical requirements, Henan company organized the defense-team to compile automatic vulnerability validation framework, port scanning and check script, weak password detection script and so on. All of these tools convenient the maintenance staffs and defense team to carry out the security basic management work [5]. For example, Python automatic vulnerability validation framework can validate whether the system exists the specific vulnerability. When there is a new vulnerability, the framework can locate the server with vulnerability through compiling the corresponding detection plug-in and load it into the framework to carry out the batch test to the target servers. Port scanning

and check script can realize the scanning and check to the internet opening ports everyday and convenient the “attack-defense-supervise” team to master the security situation by sending email to them automatically.

## Conclusion

This paper formulated the perfect regulation and work flow to guarantee the information security work conducted orderly. At the same time, pay high attention to information security talent cultivation. Strengthened the cooperative engagement capability among the different teams. During the daily work, Henan company pay attention to the tools exploitation and technology innovation and improved the work efficiency constantly. On the basic of the existing staffing configuration, improved the soft power of internal control and reduce the failure rate of system. The above measures promoted the information network performance and the integral safe operation level, they mean an important significance to the development of intelligent electric grid.

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