Research on collaborative supervision mechanism of project process management and control of scientific research outsourcing projects

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Abstract. Based on the characteristics and status of scientific research outsourcing projects, and in accordance with relevant rules and regulations of State Grid Corporation and its Shandong company, this paper explores the establishment of process control mechanism and credit evaluation mechanism of outsourcing projects in scientific research by strengthening the control of research bidding, contract management, implementation and acceptance of scientific research projects, to form a coordinated supervision mechanism for the overall planning of the ministry of science and technology and the division of labor and collaboration among various functional departments and professional centers. Responsibilities are defined at each key node to realize mutual supervision between levels in order to effectively improve post risk prevention and control ability and eliminate all kinds of clean risk. It has made the research and development process of outsourcing projects more standardized and efficient, and improved the management quality and research level of the outsourcing projects.

1. Introduction

Collaborative supervision is an important means for companies to strengthen internal supervision constraints and risk control, as well as an objective need for standardized and lean scientific research management.Collaborative supervision is conducive to integrating internal supervision resources of enterprises, giving full play to the supervision role of functional departments, and realizing the integration of internal supervision and maximization of supervision efficiency [1-5].Multiple functional departments and professional centers are designed for collaborative supervision of scientific research projects. Therefore, in order to integrate supervision resources, it is necessary to establish a coordinated and unified operation mechanism of functional responsibility and power [6-9], so as to more effectively prevent the risk of misusing scientific research funds and create a healthy and harmonious internal and external environment for the development of scientific research projects in accordance with the law.

At present, most of the research and development or test processing of the scientific research projects undertaken by our institute are outsourced. In the management process, many problems are found.In somescientific research outsourcing projects, most of the core research content is outsourced to scientific research institutes and enterprises, with a relatively high proportion of outsourcing costs.In some projects, the process of outsourcing is not strictly controlled, and the quality of the results provided by the outsourcing units is low, resulting in less effective outputs.Therefore, it is of great practical significance to strengthen the internal control of outsourcing projects and build a collaborative and efficient supervision mechanism.In this paper, by strengthening the process control of scientific research outsourcing projects, we established the performance evaluation system, carried out reasonable risk control, formed the collaborative supervision mechanism, and improved the quality and efficiency.

2. Establishment of collaborative supervision mechanism for process control of scientific research outsourcing projects

2.1 Formulating Management Plan of scientific research outsourcing projects in Shandong Electric Power Research Institute of State Grid to provide guidance and basis for managing outsources scientific research projects

In order to standardize and clarify the procedures and requirements for managing outsourcing research projects, improve the quality and efficiency of outsourcing research projects, and ensure that the research work is completed as planned and with high quality, the Ministry of Science and Technology compiled the Management Plan of Scientific Research Outsourcing Projects in light of the actual situation. It is in accordance with State Grid's general management system and related requirements of the provincial company, such as Measures for the management of scientific research projects of state grid corporation, Rules for the implementation and acceptance management of state grid corporation's headquarters scientific research project, Measures for the financial management of research and development fees of state grid corporation and so on. The Management Plan stipulates the normative requirements of planning and bidding, implementation management, acceptance management, assessment and evaluation of thescientific research outsourcing projects. The purpose is to establish a work process with unified standard, legal compliance, clear power and responsibility, and to clarify the responsibilities and obligations of the project stakeholders. It has provided guidance and basis for standardizing the management of scientific research outsourcing projects.

2.2 The project management process of scientific research outsourcing has been established, and the contents and responsibilities of the collaborative work of various functional departments and professional centers have been clarified.

According to the content of project management plan, the project management process framework of the scientific research outsourcing projects is constructed.There are 1 primary process, 4 secondary processes and 10 tertiary processes.Among them, the research management of scientific research projects is the primary process.The four processes of approval and bidding of outsourcing demand plan, contract management of outsourcing projects, implementation and acceptance management of outsourcing projects, and credit management of outsourcing project suppliers are secondary processes.For the approval and bidding of the outsourcing demand plan, three tertiary processes are set up: preparation and submission of the bidding plan, centralized audit of the bidding plan, and project bidding of the scientific research outsourcing projects. For outsourcing contract management, there are three tertiary processes: outsourcing contract review, outsourcing contract modification and termination management, and outsourcing contract payment management.For the implementation and acceptance management of outsourcing projects, two tertiary processes of project supervision and inspection and final acceptance are set up.For the credit mechanism management of outsourcing projects, there are two three-level processes: outsourcing project supplier management and project leader management.For the whole process of management, it involves the material department and the science and technology departmentof the provincial company, the science and technology department, the development department, the office, the finance department and various professional centers of the institute.

2.3 The management and control of outsourcing projects is standardized and streamlined, and the cooperation between functional departments and professional centers is more coordinated and efficient.

We carried out the review of bidding requirements and technical specifications for science and technology projects, intensified the review of outsourcing of core content, strictly controlled the proportion of outsourcing testing, and prohibited outsourcing of all core content. We also strengthened process control, conducted mid-term supervision and inspection for key projects, timely found and solved problems in the project R&D process, and ensured the smooth research of outsourcing projects.We compiled and issued acceptance guidelines for outsourcing projects,

standardizedthe acceptance standards and procedures for outsourcing projects, carrying out outsourcing technical report review to improve the quality and level of project research and development.Through the implementation of the collaborative supervision of process management and control of outsourcing projects, the content of the outsourcing demand plan is more standardized, the filling, circulation and contract signing of outsourcing contracts are more efficient, the process management and control of outsourcing projects is more standardized, and the final acceptance and evaluation of projects are more standardized.The establishment of the collaborative supervision mechanism makes the science and technology department, office, finance department, development department and various professional centers more coordinated and efficient in the management and implementation of outsourcing projects, effectively improving the risk prevention and control ability of each post and eliminating the risk of corruption.

2.4 The credit management mechanism of outsourcing projects is establishedand the innovation of collaborative supervision mechanism is realized.

According to the evaluation requirements for the cooperation of outsourcing units of scientific and research projects, a comprehensive evaluation system for outsourcing research units was established by comparing the standards of dishonesty [10].The cooperation degree of outsourcing units and project completion quality were evaluated, and a credit evaluation mechanism was established for outsourcing projects of science and technology projects. If the results of supervision and acceptance evaluation are not good enough, the project leader will be given punishments like a warning, cancelling the qualification of the applied project, terminating the project orretrieving the scientific research funds. Meanwhile, the completion of the project will be included in the annual performance evaluation of each professional center, and the quantitative evaluation results of acceptance inspection will be taken as an important reference.

3. Typical experience

3.1 Synergy

Outsourcing scientific research projects include demand plan approval and bidding, outsourcing contract management, outsourcing project implementation and acceptance management, outsourcing project supplier credit management, etc.For the whole outsourcing project management, the process involves the materials department and the science and technology department of the provincial company, the science and technology department of the institute, the development department, the office, the finance department and each professional center, which requires the cooperation of all departments and centers. Through the implementation of the project, the process is smoother, and the quality and efficiency of project management are improved.

3.2 Process management

The content, quality and standards of the work in all links of project are standardized, including planning and bidding, implementation management, acceptance management, assessment and evaluation of the outsourcing scientific research projects.The process includes one primary process, four secondary processes and ten tertiary processes. The responsibilities and obligations of the project undertaking units, professional centers of science and technology projects and functional departments of the institute and other stakeholders are clarified. A work process with unified standard, legal compliance, and clear power and responsibility workflow is established to ensure the smooth implementation of project and improve the level of project research and development.

3.3 Standardization

We have formulated the research management plan of outsourcing projects, standardized and clarified the research management procedures and requirements of the outsourcing projects, and provided guidance and basis for standardizing the project management. The text contents involved in the key links such as planning, bidding, implementation and acceptance of the outsourcing project are clarified, the provisions and requirements are specified, the process management is

standardized, and the quality and efficiency of the outsourcing research management of science and technology projects are improved.

3.4 Responsibility system

The credit management mechanism of the outsourcing projects has been established, and the cooperation of the project partners has been comprehensively evaluated according to the standards of dishonest behaviors.According to the results of supervision and acceptance evaluation, the project leaders of the cooperation unit were assessed.At the same time, the completion of the project also serves as an important reference for the annual performance assessment of each center, and comprehensively promotes the research and development of science and technology outsourcing projects.

4. Conclusion

The construction of collaborative supervision mechanism for process control of scientific research outsourcing projects is an important part of science and technology management and innovation mechanism, as well as one of the guarantee measures for the quality and risk prevention of scientific and technology project research and development. It is also a long-term systematic project.The establishment of the collaborative supervision mechanism standardizes the process control of outsourced scientific research projects and reduces the risk of misusing scientific research funds.It has formulated the management measures for scientific research outsourcing projects, put forward specific measures for project bidding, contract signing, implementation supervision and final acceptance, and clarified the responsibilities of stakeholders at all levels of the process.The issued guidelines for the acceptance of scientific research outsourcing projects have standardized the acceptance process and standards for the completion of outsourcing projects, and improved the performance evaluation level.

In the future, we will earnestly perform the responsibility of collaborative supervision, properly manage and control the risks and problems found in the process of outsourcing projects, carefully analyze the problems and immediately correct them, work hard to promote the efficiency and quality of project management, and provide a strong guarantee for supporting the construction of the corporation.

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