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Implementation of the Internal Control System in the Aviation and Space Research Organization of the National Research and Innovation Agency (BRIN)

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ABSTRACT
This research examines the implementation of the Internal Control System (SPI) at the Aviation and Space Research Organization (ORPA) which is under the National Research and Innovation Agency (BRIN). The aim of this research is to evaluate the effectiveness of SPI in supporting the achievement of organizational goals and identify the obstacles faced in its implementation. The research method used is descriptive qualitative with a case study approach. Data was obtained through in-depth interviews and analysis of related documents. The research results show that the implemented SPI has helped in increasing the operational accountability and transparency of ORPA BRIN. However, there are still several obstacles, such as limited human resources and policy changes that affect SPI's performance. Based on the research results, it can be concluded that the implementation of SPI in ORPA BRIN is not optimal. This is caused by deficiencies in SPI elements, such as the control environment, risk assessment, and control activities. In the control environment element, there are deficiencies in the aspects of commitment to competence, human resource development policies, the role of effective Government Internal Oversight Apparatus (APIP), and working relationships with stakeholders. This research provides recommendations for ORPA BRIN to increase human resource capacity, strengthen commitment to competence, and build close collaboration with APIP and stakeholders to support more effective implementation of SPI.

Keywords: BRIN, Internal Control System, Accountability, Transparency, Evaluation, Aviation and Space Research Organization

INTRODUCTION

The spirit of bureaucratic reform is described as the continuous application of the values of transparency and accountability inherent in good governance in government administrative structures (Akny, 2014) . Each government agency is responsible for enforcing accountability through the use of pre-existing internal and external monitoring units or control mechanisms to supervise regional financial operations (Herawati, 2014) . The Internal Control System (SPI) has a special meaning for leaders or management, because SPI is the front layer of supervision, which is a supporting pillar for defense in the event of deviations and obstacles to achieving predetermined goals (Ismail et al., 2022) . SPI performance is also evaluated by the BPK by publishing excerpts from the results of state financial reports and performance audits. SPI is recognized as effective if the system is planned and implemented well according to regulations in such a way that government objectives are achieved.

Each budget expenditure needs to be supported by concrete references and an initial framework that outlines the reasons for preparing the budget, therefore a control system is very important in the planning and budgeting process (Yulia & Ningsih, 2020) . In order for these aims and objectives to be achieved, the planning process must follow the financial control system mandated by Law Number 25 of 2004 concerning the National Development Planning System. Each staff member is critical to the success of the institution, as the Head of the Institution is responsible for setting goals, control mechanisms, monitoring and assessment. All SPIs contain bounded constraints. One of these limitations is the human factor in control methods. Employee misunderstandings of orders, errors, absenteeism, and cooperation with others inside or outside government may result in the loss of certain benefits. The second limitation is that SPI operates in an ever-changing setting. Therefore, shifts in the political climate, legislative priorities, and technological developments will have an impact. To anticipate this, modifications to the SPI are needed which of course have further consequences.

Stakeholders may have more peace of mind knowing that public goals will be achieved thanks to the control process. Control metrics include things like accuracy of financial reporting, security of assets, efficacy of programs and activities, and compliance with rules and regulations. Accountability and openness in the management of state finances are important components in effective governance in state administration. States have enacted a number of legal provisions designed to facilitate the achievement of these goals. Greater regional accountability and transparency will result from all regional governments carrying out control activities in all their activities starting from planning, implementation, monitoring and overall accountability, as explained in Government Regulation Number 60 of 2008 concerning Government Internal Control Systems. Managing money. well organized; effective; economical. That is why it is important to have a system that can ensure accurate reporting on regional financial management and efficient implementation of government operations. protect regional assets and foster a legal culture. The law is an expression of a desire to restructure the country's economy and a call for fundamental adjustments to the way government finances are handled (Ranadhani et al., 2021) .

The Financial Audit Agency (BPK) is one of the cornerstones of the nation's life, as the only external auditor, and its role has been confirmed in accordance with the Amendment to the 1945 Constitution and Law Number 17 of 2003 concerning State Finances. This implies that audits in the public sector have been explicitly and clearly recognized by law. In deciding what to inspect and how thoroughly, the BPK in its role as an external supervisor always looks at the robustness of the Internal Control System (SPI). Internal control is assumed to be comprehensive in all government activities based on Government Regulation no. 60 of 2008, with human resources as a determining factor in the level of trust given. With this in mind, we created a part of the Internal Control System that serves as a benchmark to measure the success of the actual implementation of the system. The elements of the Internal Control System are

developed holistically by considering costs and benefits, human resources, clarity of effectiveness assessment criteria, and advances in information technology.

To assist the implementation of the State Financial Reform Package towards Good Governance or good governance and Good Government, PP No. 60 of 2008 concerning SPIP. The internal control concept issued by COSO (The Committee of Sponsoring Organizations of the Tread way Commission) is the basis for the government's Internal Control System which uses ERM (Enterprise Risk Management), IC (Internal Control), and FD (Fraud Deterrence). To improve organizational performance and governance. For any business to be successful over the long term, it must adhere to COSO's core principles of risk management and sound internal controls. Control Environment, Risk Assessment, Control Activities, Information and Communication, and Monitoring Internal Control are aspects of SPI that have been implemented in government environments throughout the world and are referred to in SPIP. Moeller (2007: 4-5) likens the Coso version of the internal control model to a Rubik's cube, where the five elements mutually strengthen each other based on the organizational structure, including financial operations reporting compliance through efficient and effective activities, trustworthy financial reporting, asset storage, and compliance with relevant regulations. By maintaining authority, BRIN is in a position to oversee project implementation and increase confidence in its ability to achieve its stated objectives. Implementing the core elements of SPIP Control Environment, Risk Assessment, Control Activities, Information and Communication, and Internal Control System Monitoring within BRIN will help the organization achieve its goals (Wanditha & John, nd) .

Research by Putra (2021) with the title "Risk Assessment Analysis" in SPIP Padang Panjang City aims to assess the implementation of Risk Assessment within the SPIP framework. This descriptive study with a qualitative approach examines several risk dimensions in accordance with Government Regulation No. 60 of 2008. The results of the research show that the Risk Assessment in the Padang Panjang City SPIP is considered adequate, but there are weaknesses that need to be considered to improve the SPIP effectively and efficiently (APRIO, 2016) . Research by Indriani (2023) evaluated the implementation of SPIP in work unit X to increase accountability and minimize findings related to aid distribution. Data was obtained through observation, documentation and interviews, and then analyzed using content analysis. The research results show that SPIP in work unit Some evaluation results have not been fully followed up so that the improvement process is hampered (Indriani & Siswantoro, 2023) . Research by Kristianto (2022) examines the factors that influence compliance with internal control, namely rewards, work stress, and work environment as mediating variables. Data was obtained from 63 government officials in Yogyakarta and analyzed using mediation regression. The research results show that rewards have a positive effect on the work environment and employee compliance with internal control, while work stress does not affect both, and the work environment does not function as a mediating variable (Sunaryondi & Oetomo, 2019) .

Against this background, the Internal Control System of the National Research and Innovation Agency at the Aeronautics and Space Research Organization reveals several things. First, there is a weakness in the administration of inventory goods at ORPA which is less orderly. Second, the output produced cannot yet be utilized. Third, poor procedures for inventorying BMN assets. Fourth, State Property has not been managed adequately. Fifth, the Financial Report cannot yet be achieved with a full WTP opinion. The purpose of this research is to analyze factors that have not yet optimally assessed the risk in the Internal Control System at the BRIN Aviation and Space Research Organization, as well as to determine the risk assessment model in the Implementation of the Internal Control System at the BRIN Aviation and Space Research Organization. It is hoped that the results of this research can provide recommendations for

leaders and implementers to make the Implementation of the Internal Control System in the BRIN Aviation and Space Research Organization even better.

RESEARCH METHODS

This research uses a qualitative research method with a case study approach. Participant observation, in-depth interviews, and documentation were carried out simultaneously for the same data source to ensure the validity of the results of this research. Triangulation, compared with a single method, would greatly strengthen the data. To gain insight into a subject of interest, two or more people may get together in person or by telephone for the purpose of conducting an interview. The data source for this research comes from the results of active face-to-face interviews and observations of informants at the Aviation and Space Research Organization involved in SPIP activities. Members of the State Civil Apparatus (ASN) who are trusted to understand the process of implementing SPIP at the National Research and Innovation Agency's Aviation and Space Research Institute were chosen as the main sources because they are the ones who have authority over the duties and functions of SPIP.

The research observations carried out were in the work unit implementing the implementation of the internal control system by bringing the observation sheet made. Data processing and analysis techniques are carried out through several stages: first, classifying data material by transcribing interview recordings and analyzing secondary data such as budgeting documents and regulations. Second, data validation was carried out by triangulation to ensure the validity of the data using various sources. Third, data analysis starts from data collection, arranging, grouping, and looking for patterns to draw conclusions. The analysis process includes data reduction by narrowing information through interviews and document examination, data presentation that makes it easier to draw conclusions, and data verification to ensure conclusions are consistent and valid so that they can become a reference for further research.

RESULTS AND DISCUSSION

Overview of SPIP Implementation in the BRIN ORPA Environment

Based on the results of the interview, the Head of ORPA, Robertus Heru Triharjanto, said that, "SPIP within ORPA is implemented by the Government Internal Control System Task Force (ST SPIP). In this case, the SPIP is implemented by covering 3 main aspects, namely Internal Supervision, Routine Audits and Periodic Reporting. Each process is always accompanied by BRIN's Government Internal Supervisory Apparatus (APIP). "The implementation of this SPIP is to ensure that all BRIN ORPA work processes run in accordance with established work policies and procedures."

In every activity or research carried out by ORPA, routine planning and evaluation is always carried out to achieve effectiveness and efficiency. This planning and evaluation is also part of the SPIP implementation carried out within the ORPA environment. Technically, SPIP implementation is responsible for the SPIP ORPA Task Force. In this context, the implementation of the internal control system received assistance from APIP auditors.

Based on the results of interviews with informants and matching them with documentary evidence and observations, a general description of the SPIP implementation procedures at ORPA BRIN is as follows:

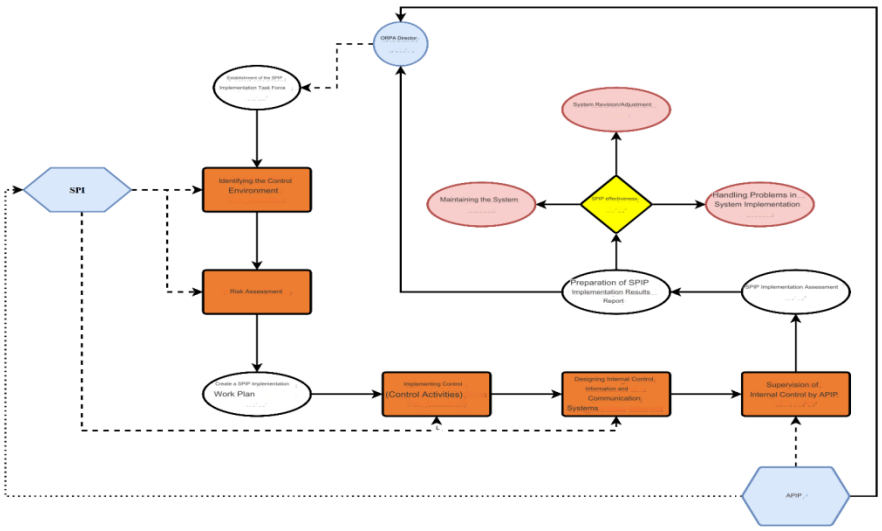

Figure 1 SPIP Implementation Procedure at ORPA BRIN

The Head of ORPA as the person responsible for implementing SPIP within ORPA BRIN formed a SPIP Task Force (Satgas) based on a letter of assignment. Once formed, the Task Force or what is also often referred to as SPI (Internal Control Task Force) identifies the control environment or locus of control activities to be carried out. This activity also includes an analysis of the scope, human resources and various infrastructure required. The next process is to carry out a risk assessment which includes protection of assets (State Property), the chance of an event occurring that could be detrimental to the organization, measuring the impact of risk, and other aspects related to this. After that, SPI created a work plan for implementing SPIP to be approved by the Head of ORPA. If the Head of ORPA has approved the SPIP implementation work plan, the next process is to carry out control activities, design information and communication systems in the control process, as well as the supervision or assistance process carried out by APIP.

Internal control activities that have been implemented and supervised by APIP will then be evaluated in a comprehensive assessment process regarding each SPIP stage that has been implemented. The results of the evaluation are then made into a report to the Head of ORPA to then provide a decision as to whether the SPIP implementation has been effective or whether there are still aspects that need to be improved. If SPIP implementation has run effectively or optimally, then the system will be maintained and will continue for the next fiscal year. On the other hand, if it turns out that there are obstacles that result in the implementation of the SPIP not being optimal, and then the Head of ORPA will consider revising or improving the SPIP. This decision can be taken using a decision letter from the Head of ORPA and must first obtain approval from the official above. The evaluation results of SPIP implementation can also be followed up by handling problems in system implementation directly or periodically.

Based on Figure 1, the SPIP implementation procedure refers to the Regulation of the Minister of Research, Technology and Higher Education of the Republic of Indonesia Number 56 of 2016 concerning the Government's Internal Control System within the Ministry of Research, Technology and Higher Education. In these regulations there are 5 elements of SPIP, namely control environment, risk assessment, control activities, information and communication, and internal control monitoring. An overview of the SPIP elements in ORPA BRIN can be presented as follows:

a. Implementation of Control Environment

When referring to COSO standards, there are 5 principles in environmental control that need to be identified and implemented properly. First, organizations need to demonstrate a commitment to integrity and ethical values. Second, leaders need to pay attention to and test the development and performance of internal control. Third, leaders and supervisory elements are responsible for achieving organizational goals. Fourth, the organization shows its commitment to directing, building and improving the competence of individuals (organization members) so that it is in line with achieving organizational goals. Fifth, the organization must ensure that each individual has accountability in carrying out their respective internal control authorities.

These five principles are often implemented with adjustments to the context of government organizations in Indonesia (Nurokhman & Primasari, 2023) . For example, stating that the five principles of environmental control can be 8 sub-indicators of the success of environmental control, namely 1) Upholding integrity and ethics, 2) Commitment to competence, 3) Conducive leadership, 4) Establishing an organizational structure that suits needs, 5) Delegation appropriate authority and responsibility, 6) Preparation and implementation of sound policies regarding human resource development, 7) Realization of the effective role of APIP, and 8) Good working relationships with relevant government agencies. In the BRIN ORPA environment, the implementation of environmental control is carried out in order to improve comfortable environmental conditions so as to raise concern and participation of all employees, so it must be a joint commitment in implementing it. This is very important for the implementation of other SPIP elements. Based on the results of triangulation from interviews, document review, and observations, a description of the implementation of environmental control at ORPA can be explained as follows:

i. Upholding Integrity and Ethics

Enforcement and implementation of ethical values within ORPA is carried out through regular training and outreach regarding organizational values. In an interview, the Head of ORPA said, "ORPA also strives to ensure that every project and activity in the form of research carried out by all members of the ORPA organization always adheres to high ethical standards, including respect for human rights and environmental protection. To achieve efficiency and effectiveness in the results of research activities, each member of the organization carries out careful planning and applies the latest technology. ORPA also conducts regular evaluations of each proposed research project to ensure that the resources used are appropriate to the results achieved. Apart from that, ORPA also continues to innovate to increase productivity without sacrificing quality. "

Regarding integrity, ORPA views it as one of the main pillars in the activities of every member of its organization. The head of ORPA added, "We also ensure that every member of the organization understands and complies with the established code of ethics. ORPA also has a strict internal monitoring mechanism to ensure there are no irregularities in the implementation of its duties. In its implementation, ORPA has several layers of supervision, starting from internal audits carried out every semester by the inspectorate, an ethics committee, to periodic reports that must be submitted by each Head of Research Center. Apart from that, ORPA also encourages a culture of openness where every employee can report violations without any pressure from any party."

This explanation from the Head of ORPA was strengthened by the results of an interview with one of the SPI members, Husni, who stated, "Value and ethical enforcement activities carried out in the context of environmental control by ORPA are standard, using a number of official documents. Some of these documents include official memorandums, circulars and leadership regulations which were then socialized to all ORPA members. Apart from that, the success of upholding these values and ethics is also

monitored regularly. Employees who excel or violate will be given rewards, while those who violate will receive sanctions. These ethics and integrity enforcement activities are accompanied, supervised and consulted regularly with APIP. This is important to be able to review and improve existing regulations. However, when researched by researchers, no documentary evidence was found that was part of the evaluation of ethics and integrity enforcement activities."

ii. Commitment to Competence

In an effort to increase competency and apply ethical values for human resources to support the implementation of SPIP, the Head of ORPA stated, "We carry out routine training and outreach. The training and socialization is related to organizational values and also includes the implementation of SPIP. Every project and research carried out by ORPA is also required to comply with ethical standards which are also part of SPIP implementation." Apart from routine training and socialization, ORPA's commitment to competence is also realized by implementing a global leadership style. This was revealed through an interview with one of the SPI members, Misran, who said, "Commitment to competence is carried out in the ORPA environment by applying a global leadership style. Global leadership in this context is related to policy making related to competence. Organization members who are one level above can provide input to all employees that training on the government's internal control system is very important to implement. Apart from the fact that knowledge about SPIP and risk management continues to develop, there are other aspects that are beyond the ordinary which require a more adaptive response and innovation. "On that basis, leadership at ORPA increases the competence of leaders and their staff by attending webinars, training or other things that can increase competence."

iii. Formation of Organizational Structure According to Needs

ORPA BRIN has an organizational structure that handles environmental control in order to support asset security. Based on the results of the interview, the Head of ORPA said, "The formation of an organizational structure within ORPA in the context of implementing environmental control principles is carried out in order to support asset security. The structure is designed to ensure that every asset owned by the organization is properly protected. This structural model consists of several layers that have specific functions and responsibilities related to asset security. Each layer coordinates with each other to ensure that there are no gaps in our security system."

The organizational structures in the framework of environmental control consist of 3 layers. This is based on the results of an interview with the Head of ORPA who explained, "Our organizational structure consists of three main layers, namely the executive layer, managerial layer and operational layer. The executive layer in the ORPA environment consists of the head of ORPA, the person in charge of OR, the person in charge of PR, and top management who are responsible for establishing general policies regarding asset security. This executive layer is also tasked with overseeing policy implementation and ensuring that the entire organization complies with established security standards. Meanwhile, the managerial layer consists of Commitment Making Officers (PPK) who are responsible for implementing asset security policies in their respective work areas."

PPK also carries out routine supervision and training for staff to ensure that security procedures are followed properly. The operational layer consists of State Property (BMN) staff and technicians working directly with assets. They are trained to recognize potential risks and take preventive actions according to established procedures. This layer is also responsible for reporting any incidents or threats to assets to management.

Based on the results of the interview, one of the PPK members, Brother Kuncoro, said, "The asset guarantee process is one of the priorities. ORPA ensures that all financial and non-financial assets are

managed well through an integrated asset management system, routine monitoring and appropriate training for users. ORPA uses an information technology-based asset management system that enables real-time asset monitoring. This system includes asset inventory, maintenance, and asset condition reporting. The existence of this system can ensure that every asset is properly recorded, in optimal condition, and ready to be used by users whenever needed."

In relation to asset management, PPK ORPA also carries out regular needs assessments by involving asset users in the planning process. This is to ensure that each asset procurement is based on real needs and can support user tasks and functions effectively. Apart from that, ORPA also implements a feedback mechanism where users can provide suggestions and criticism regarding the assets used. In this context, Brother Kuncoro explained, "ORPA has clear and structured problem handling procedures. Any asset related issues, such as damage or loss, will be immediately reported through the ORPA reporting system. The BMN ORPA team or staff will conduct an investigation and take the necessary actions to correct the problem. Apart from that, ORPA also has insurance to protect assets from unexpected losses."

iv. Delegation of Authority and Responsibility

Based on the results of the interview, one of the SPI members, Husni Wahyuno, said, "Authority and responsibility within the ORPA environment are given to employees by forming work teams. The duties and authority of the work team have been determined so that they are clear and in line with targets. The determination of the work team members is carried out using a merit system, where the appointed human resources are adjusted to their competencies. Apart from that, responsibility and authority are also determined according to the needs and level of position required. If cross-authority is needed, coordination will be strengthened."

The principles applied in delegating authority and responsibility is based on a conducive work environment and the principle of trust, in accordance with the portion and authority of each team member's work. Team solidarity is the value that underlies work implementation to achieve organizational goals. Within the scope of leadership, there are regular coordination meetings to provide information regarding work plans. Apart from that, there are also regular coordination meetings regarding planning for the procurement of goods and services that will be implemented. Leaders apply a participative and open management style and use a mediation approach to resolve conflicts. To measure the success of this delegation of authority and responsibility, the SPI team conducted an employee satisfaction survey to assess perceptions of the leadership's management style.

Regarding the role of the internal control work force or SPI, Husni explained, "SPI plays a role in supporting the achievement of asset security. SPI in the ORPA environment takes various steps to secure assets by identifying, managing and monitoring risks related to asset security. There are several main steps taken to secure assets in the ORPA environment. First, carry out an inventory of all assets owned by the work unit. This process includes physical assets such as buildings, vehicles, equipment, and other assets. Second, the SPI team analyzes potential risks that could threaten the security and integrity of assets. These risks include loss, damage, theft and misuse."

v. Preparation/Implementation of Policies Regarding Human Resources Development

Based on the results of the interview, one of the Commitment Making Officials, Brother Kuncoro, said, "Human resource development has been carried out routinely, especially in relation to the management and use of assets. Employees, especially State-Owned Baran staff, regularly hold training for asset users. This training covers the correct way to use assets, routine maintenance, as well as reporting procedures

in the event of damage or loss of assets. The aim is to ensure that each user has the knowledge and skills necessary to utilize assets optimally and responsibly."

vi. Realization of the effective role of APIP

Based on the results of the interview, one of the APIP members, Brother Bona Ernest, said, "APIP plays a role in carrying out internal supervision of the budget in each work unit within ORPA. This supervision is carried out by reviewing the Work Plan and Budget (RKA). The review of the RKA is carried out by examining the preparation of financial documents in the form of annual RKA for each work unit. "This activity aims to provide confidence that the budget that has been prepared is in accordance with applicable regulations and is effective, efficient and economical in all spending elements and has supported the achievement of work unit objectives."

This information regarding the role of APIP was confirmed by PPK ORPA. Based on the results of the interview, one of the PPK members, namely Kuncoro, said, "Routine supervision is carried out through internal audits. PPK and all ORPA members are audited by the BRIN APIP team who periodically carry out inspections of assets to ensure that these assets are used in accordance with the objectives and applicable regulations."

vii. Good Working Relations With Related Government Agencies

ORPA BRIN has 14 working partners or stakeholders from various related agencies. Some of these agencies include central government agencies, regional governments, universities, the defense industry, and so on. However, there is not adequate information regarding the working relationship between ORPA BRIN and each of these agencies or stakeholders. Based on explanations from informants along with document review and observations, the flow of implementation of the control environment as part of SPIP in the ORPA environment can be described as follows:

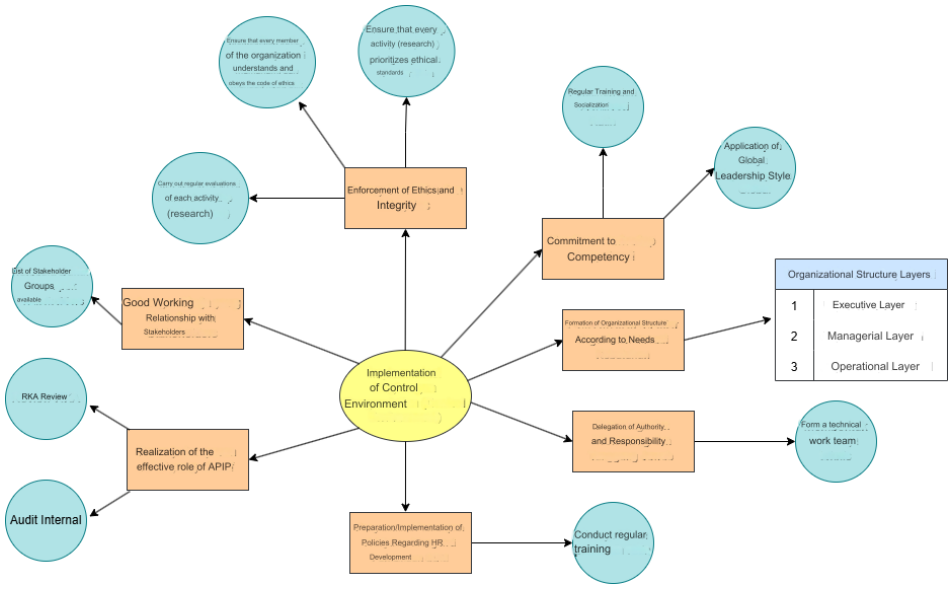

Figure 2 Overview of the Implementation of the Control Environment at ORPA BRIN
Source: Processed by the Author

b. Risk Assessment

Based on the results of interviews with 2 informants who are ORPA SPIP implementers, Husni Wahyuno and Misran (interview recordings, attachments 3 and 4) and based on a triangulation process by comparing them with document review and observation, risk assessment at ORPA BRIN is carried out by

formulating the scope of management activities risks related to obstacles and responsibilities in achieving the implementation of the main tasks and functions of the organization. The risk assessment process begins with determining organizational goals by the Head of ORPA guided by statutory regulations by considering the following matters:

1. Determine the overall goals of the Research Organization in the form of vision, mission and targets, as outlined in the strategic plan and annual performance plan.
2. The overall objectives of the Research Organization are prepared in accordance with the program requirements established by statutory regulations.
3. The overall research organization's objectives should be sufficiently specific, measurable, achievable, realistic and time-bound (SMART).
4. All objectives of the Research Organization are clearly communicated to all employees so that leaders receive feedback indicating that the communication is working effectively.
5. Leaders of research institutions and organizations determine operational strategies that are consistent with BRIN's strategic plans and risk assessment plans.

Implementation of risk assessment at ORPA BRIN includes 4 activities, namely risk identification, risk analysis, risk evaluation, and risk mitigation . These activities aim to map risks that could become obstacles to achieving organizational goals as determined by the Head of ORPA. Apart from that, another objective to be achieved in this risk assessment activity is to ensure that no material or immaterial losses occur in any ORPA activities.

i. Risk Identification

According to APIP sources, Bona Ernest said: “The process of identifying risks is the activity of identifying all risks that may occur in the implementation of an activity or process. This process involves gathering information about potential problems or challenges that could interfere with achieving the activity's goals. This risk identification process aims to determine all risks that influence the achievement of ORPA's strategic targets. The risks obtained from the results of this identification include events, causes and impacts of risks." In the risk identification process, according to another SPI member, Husni Wahyuno, he explained: “The risk identification process in the ORPA environment involves 3 main steps. First , understand the organizational context and objectives of preparing financial reports. This process can identify areas that are most susceptible to risk. Apart from that, this process is also part of efforts to implement the principles of accountability and transparency of the information available from financial reports. The second step in identifying risks is to look for conditions that could result in the reliability of financial reports not being met. For example, there is a lack of detailed data presented in financial reports, a lack of evidence of supporting transactions, basic or budgeting documents, and others. The third step, risk identification is also carried out by mapping all financial processes or transactions that occur within the ORPA environment. This process is related to recording transactions, preparing financial reports, and budgeting."

In implementing the 3 risk identification steps, the ORPA management team, facilitated by a team of accompanying auditors, conducted questions and answers through Focus Group Discussions (FGD) to help make it easier for the Work Unit to identify potential risks that could affect the achievement of organizational goals. The parties who are stakeholders are parties who interact and have an interest in an ORPA output and/or outcome, namely:

Table 1. Table List of Stakeholders of the National Research and Innovation Agency

No	List of Stakeholders	Information
1	Head of BRIN	The head of BRIN is subordinate and responsible
2	Work unit within BRIN	Program facilitator, budget, HR, infrastructure, KI, and others
3	Central Government Agencies	Partner of aviation and space science and technology users
4	Local Government Agencies	Partner of aviation and space science and technology users
5	College	Developing ORPA's science and technology human resource capacity
6	College	Aviation and space research partners
7	Defense Industry	Rocket technology development partner
8	Satellite Industry	Satellite technology development partner
9	Aviation Industry	Aviation technology development partner
10	ICT, Remote Sensing and GIS industry	Remote sensing technology development partner
11	UN agencies (UN-ESCAP, UN-SPIDER, UN-OOSA, and others)	Aviation technology research/development partners
12	Foreign Space Agencies (NASA, ISRO, CNES, and others)	Technology research and development partners
13	Research Organization at BRIN	Technology research and development partners
14	and others	-

Source: 2022 ORPA Performance Report

Based on the results of the interview, one of the SPI members, Brother Misran, said, "There are several risks that are often identified, including the risk of operator errors in inputting financial transactions, the risk of manipulating financial data, as well as technology systems and data security. Apart from that, other risks are related to compliance with regulations and the use of accounting standards. The most frequently identified risks are all related to aspects of financial reporting. Apart from these risks, several other risks that are often faced include the risk of loss or theft of assets due to inadequate physical security, the risk of asset damage due to improper handling or lack of maintenance. In maintaining these assets, ORPA has weaknesses, namely limitations in human resources who have the competence to manage them. Another risk in the context of assets is misuse of assets by unauthorized employees or external parties. For example, it is not uncommon for office BMN to be taken home or used but not maintained properly. In each risk identification process, SPI will then analyze the risks based on the scale of impact they have the potential to produce."

ii. Risk Analysis

As for the risk analysis process, the aim is to map the potential impact and possibility of these risks occurring to determine the magnitude of the risk and the risk level. The risk analysis process in the ORPA environment is focused on 4 indicators of ORPA performance success. Thus, these risks include: 1) The risk of not achieving the number of international scientific publications, 2) The risk of not achieving the external budget ratio from research/research collaboration, 3) The risk of not achieving the citation target for international publications, and 4) The risk failure to achieve the target number of Intellectual Property Rights that are ready to be utilized.

This risk analysis is also carried out to determine the level of risk faced by ORPA by using a risk assessment matrix to categorize risks based on the level and impact of their possible occurrence. However, the risk analysis carried out in the ORPA environment has not been specifically related to the risk aspect of loss or loss of assets in the form of BMN. In fact, safeguarding these assets is an important aspect in the risk analysis process.

In conducting risk analysis, SPI also often uses SWOT analysis (Strengths, Weaknesses, Opportunities, Threats), analyzes financial reports, and reviews financial reports by the inspectorate every quarter. In these processes, SPI often finds discrepancies in recording fixed assets through internal audits. In accordance with the explanation of the interview results, one of the A PIP members, Sinta Pertiwi, said, "The implementation of risk analysis is to determine the level of possibility and the level of impact of the risk occurring based on risk criteria. After considering the reliability of the control system, the stages in the risk analysis carried out are: 1) Taking an inventory of the internal control system that has been implemented within the ORPA BRIN environment, 2) Determining risk criteria which include criteria for the possibility of risk occurring and criteria for risk impact." Meanwhile, according to the results of the interview, one of the APIP members, Danang, said, "The risk analysis process that has been implemented at ORPA BRIN is in accordance with Chief Decree Number 208 of 2022 concerning risk management guidelines within BRIN, accompanied by the Government's Internal Supervisory Apparatus. However, there are still a number of weaknesses and obstacles in the analysis process."

iii. Risk Evaluation

After the risk analysis process, ORPA then evaluates the identified risks. As stated by one of the APIP members, Bona Ernest, said, "The risk evaluation process is carried out by determining the level of impact and the possibility of its occurrence. This evaluation helps determine which risks are most significant and require further attention. This risk evaluation process involves 2 main activities. First, compare the previous year's performance achievements with the performance targets for the current year and next year. Second, measure the impact of the risks that have been identified and analyzed. The main purpose of comparing performance achievements in evaluating risks is to ensure that risks related to obstacles to performance achievement can be handled. "The evaluation of the impact of risks aims to develop a priority scale for handling the risks that have been evaluated." Apart from the two main activities in the risk evaluation process, ORPA also implements control strategies in every activity implementation. This control strategy is an inseparable part of the risk evaluation process. This process includes implementing new procedures, staff training, or other changes necessary to reduce risk. The control strategy is evaluated periodically to ensure that the control strategy is still relevant and effective in managing risk.

iv. Risk Mitigation

Based on the results of the interview, APIP member Sinta Pertiwi explained that risk mitigation is carried out by controlling selected risks to reduce the likelihood or impact of risks to an acceptable level. The steps include identifying and selecting risk mitigation options, developing risk mitigation plans, and implementing mitigation plans. The choice of risk mitigation options includes four options. First, reduce the likelihood of the risk occurring by addressing its causes. Second, reduce the impact of the risk when it occurs. Third, divide the risk by transferring part or all of the risk to another competent party. Fourth, avoid risks by not carrying out activities that pose risks, if risk reduction exceeds the UPR's ability and the activities that are not carried out or stopped do not hinder the duties and functions of the UPR, and are approved by the UPR leadership.

The risk mitigation planning process includes details of internal control activities to be carried out, which are then implemented by SPI ORPA and APIP with the assistance of auditors. Auditors act as facilitators

in making it easier for work units to prepare risk assessments that must be prepared and implemented by all leaders and employees at ORPA. According to Misran from SPI, they also verify financial data in the Financial Statements by involving the Planning Coordinator, Budget Implementation and Control Coordinator, and Commitment Holder Officials. SPI ORPA conducts risk assessments to identify potential errors and develop additional controls to mitigate risks.

Based on the risk assessment process that has been described, the general picture is as follows:

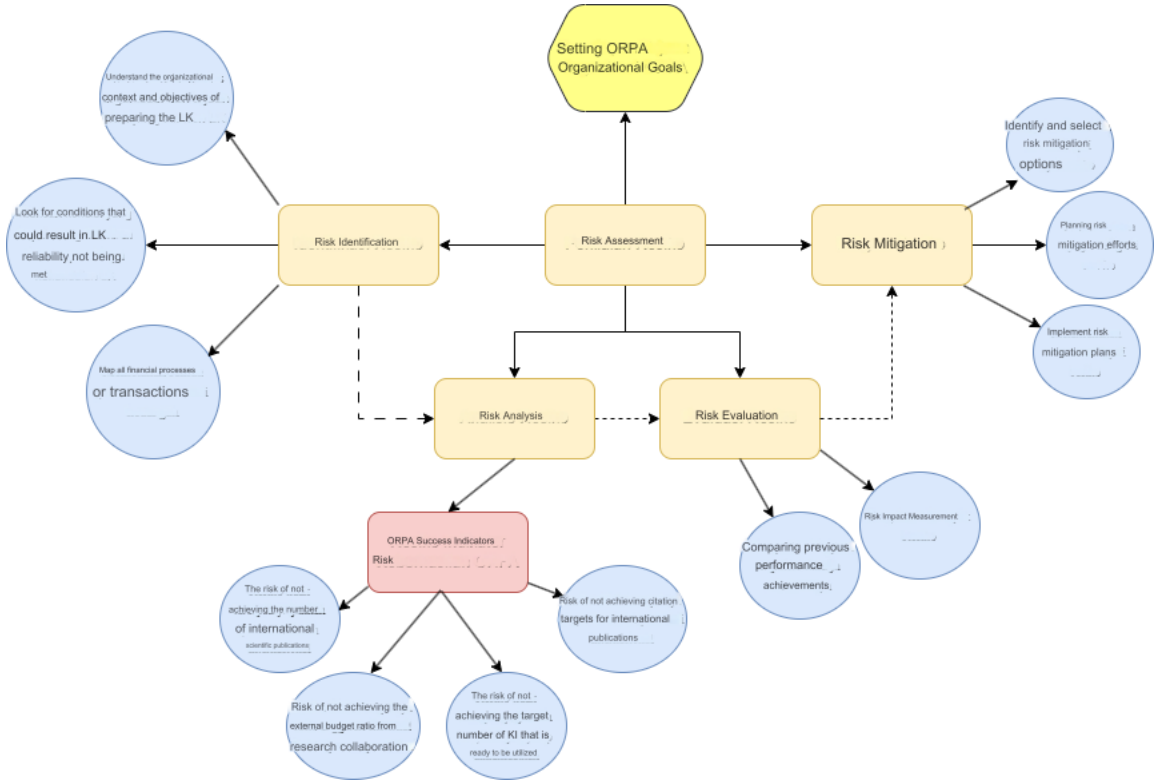

Figure 3 Overview of Risk Assessment at ORPA BRIN

c. Control Activities

Based on the results of the interview, Husni Wahyuno, a member of SPI ORPA, stated that SPI ORPA uses an integrated and up-to-date asset recording system to monitor asset recording, storage, maintenance and reporting. Control activities by SPI ORPA include regular inventories and physical audits to ensure data accuracy as well as the implementation of security systems such as CCTV and access control. There are five control activities implemented by SPI ORPA: asset risk analysis and mitigation strategies, staff training on asset security, evaluation of the control system, analysis of the system's success in achieving organizational objectives, and regular audits to identify risks and corrective actions. However, there are some shortcomings in these control activities. According to Husni Wahyuno, the biggest shortcomings are the lack of competent human resources in asset management and facilities and infrastructure that have not fully supported the implementation of SPIP. It is necessary to increase the competence of organizational members regarding the use of technology for asset management and more regular training on asset management procedures. Misran, another SPIP member, added that asset management is a shared responsibility, so all employees must be actively involved in maintaining asset security and complying with established policies and procedures. Collaboration and communication between all members of the organization are essential in the implementation of SPIP.

In implementing SPIP, SPI ORPA is always assisted by APIP. Sinta Pertiwi from APIP stated that every control activity by ORPA always receives assistance and supervision from APIP based on Presidential Decree No. 16 of 2018 concerning the procurement of goods and services article 77. In addition, APIP also controls by monitoring and reviewing to ensure risk management is effective and provides input for improvement. In addition to APIP, monitoring is also carried out by UPR, the Risk Management Compliance Unit, and the Main Inspectorate. Bona Ernest from APIP explained that the function and role of APIP in providing added value to the Work Unit includes internal supervision of performance and finance through audits, reviews, monitoring, evaluation, and other supervisory activities to ensure activities are carried out in accordance with the provisions effectively and efficiently in order to realize good governance. An important control in SPIP is asset control, which includes management of ownership and recording of government assets, as well as procedures for procurement, maintenance, and transfer of assets. Work Units should identify risks related to asset management and develop control strategies to reduce or manage those risks, including segregation of duties in asset management to prevent errors or misuse.

Every control activity carried out by SPI and supervision by APIP is based on a control action plan. The control action plan was prepared by SPI and APIP. The role of APIP in this control action plan was explained by Bona Ernest with the following statement, "APIP's role in the control action plan in the work unit is by monitoring the Control Action Plan (RTP) document that has been prepared previously. If the plan has not been implemented, APIP will evaluate the implementation carried out by the Work Unit, whether the Control Action Plan that has been prepared is on target or whether further improvements need to be made in order to mitigate existing risks. APIP can also provide assistance to related Work Units in analyzing risks, determining risks, and preparing control action plans. Through this assistance, APIP assists work units in managing risks effectively, increasing accountability, and ensuring smooth operational continuity. This is an important part of efforts to improve performance and meet organizational goals."

APIP is responsible for evaluating the implementation of SPIP in each work unit every year, as stated by Mr. Danang. According to the Financial and Development Supervisory Agency Regulation Number 5 of 2021, this evaluation is to ensure that SPIP implementation is running well. Control activities include the handover of procured assets from the PPK to the KPA and the recording of these assets with the BMN NUP to the Ministry of Finance for immediate distribution to users. Mr. Danang elaborated that control measures are tailored to the characteristics and problems of the work unit, with APIP providing assistance if risk mitigation fails to achieve objectives. The Head of ORPA highlighted the challenges in ensuring ORPA employees understand and are committed to SPI, which is addressed through communication, training, and resources, emphasizing that an effective Internal Control System is critical to the success of the organization, ensuring efficiency, compliance, and building trust and integrity.

Another part of control activities is identifying performance bottlenecks, measuring and evaluating performance, and implementing improvement strategies. This has been done by ORPA BRIN as revealed in the interview with PPK, Mr. Kuncoro: "In setting financial benchmarks and periodic performance achievements, we ensure that each unit operates according to the set plans and objectives. This process includes planning, performance measurement, obstacle analysis, and improvement strategies. We set annual budgets based on the organization's strategic goals and assign specific financial targets to each unit. After identifying performance bottlenecks through data analysis, we hold evaluation meetings with each unit to discuss the main causes of bottlenecks and find effective solutions. We also develop clear corrective action plans and improvement strategies, including budget adjustments, operational process changes, or resource enhancements, and conduct regular monitoring to ensure strategies are on track."

d. Information and Communication

Information and communication channels in the context of SPIP implementation within ORPA BRIN are carried out by distributing information on various occasions and media. One of these opportunities is through training and outreach activities. This was expressed by Misran who said, "In order to distribute information, SPI routinely holds training and outreach for all employees regarding the importance of securing assets. This training and outreach also relates to ways to maintain asset security and incident reporting procedures. Socialization is carried out through various internal communication media such as direct meetings, online modules and printed materials." Information and communication channels within ORPA BRIN are also supported by the existence of a performance management system in order to achieve effectiveness and efficiency. This was expressed by PPK, brother Kuncoro, who said, "Consistency and effectiveness of performance assessments are maintained through a structured and transparent performance management system. We have clear guidelines and procedures regarding performance measurement and evaluation. Apart from that, we also use information technology to facilitate data collection and real-time performance analysis, namely SKP which is used by all BRIN employees. We carry out regular tiered reviews to ensure that this process is always relevant and in line with organizational dynamics and the external environment."

The existence of the system as mentioned by Brother Kuncoro has great benefits for all ORPA members. With this system, each ORPA member can report the progress of their activities on an ongoing basis. This is as expressed by the Head of ORPA as follows, "The periodic reporting system allows each research center to report their activities and achievements on a regular basis. These reports are analyzed by management to identify trends, potential problems, and areas requiring special attention. This way, we can take corrective action quickly and ensure that all parts of the organization remain committed to our goals and values. And we ensure commitment to SPI through various means, including ongoing training for all staff, socialization of new policies, and providing incentives for those who demonstrate good performance in internal control. We also encourage openness and transparency, so that every member of the organization feels responsible for their contribution to SPI."

e. Internal Control Monitoring

Monitoring or supervision of internal control within ORPA BRIN is carried out by APIP. Based on the results of the interview, one APIP member, Sinta Pertiwi said, "APIP carries out a review of the Ministry of Institutions' Budget Work Plan (RKA-K/L) and a Review of Budget Absorption and Procurement of Goods and Services (PAPBJ). The supervisory measures referred to take the form of adequate confidence in the ongoing PBJ process. APIP should be able to assess and ensure that risk management, internal control and governance in PBJ are effective in preventing corruption."

To date, the supervisory actions carried out by APIP within ORPA BRIN have referred to various applicable regulations, one of which is Minister of Finance Regulation Number 62 of 2023. In this regard, one of the APIP members, Brother Danang, said, "Supervision carried out in order to provide assurance on budget preparation in work units is the implementation of review activities. In this case, BRIN's main inspectorate has carried out a review of BRIN's indicative ceiling (preliminary discussion of the ceiling plan) up to BRIN's allocation ceiling (determination). APIP BRIN will also provide a review every time there is a change/revision to the working unit budget in accordance with the authority regulated in the Minister of Finance regulations (PMK 62 of 2023). Apart from that, every quarter APIP also carries out a review of the procurement of goods and services to ensure that the planned budget can be executed on time, as well as providing confidence that the procurement process carried out in accordance with existing regulations has provided added value, this can be seen from performance achievements of the work unit. "Indeed, this added value cannot be felt directly, but several monitoring activities have

provided input for the work unit leaders to make several policy improvements in the management of work units."

In implementing this monitoring process, the Head of ORPA also plays a major role. Primarily to ensure that every activity complies with applicable standards. In this regard, the Head of ORPA also formed a task force to monitor the implementation of various activities. The Head of ORPA said, "Internal supervision is carried out through the appointment of a special committee, namely we formed a special ORPA Internal Monitoring Unit which is tasked with monitoring the implementation of research projects and daily activities. This SPI ensures that every activity complies with established operational standards and ethical policies. In addition, they are also responsible for assessing risks and providing recommendations for improvement if deviations are found. We also carry out routine audits every three months. This audit includes a financial report review, operational audit, and compliance audit. The goal is to ensure that all funds and resources are used efficiently and in accordance with the organization's goals (Turetken et al., 2020). These audits also help identify areas that need improvement and ensure that each department complies with applicable policies and procedures. And we also received assistance in determining risk management carried out by BRIN Inspectorate 1."

Obstacles in Implementing SPIP in ORPA BRIN

The implementation of SPIP within ORPA BRIN faces several obstacles, mainly related to human resources and supporting facilities and infrastructure. One of the SPI members, Husni, revealed that the biggest obstacle is the lack of competence of human resources in asset management and facilities that are not yet fully supportive (Pirdaus et al., 2021). The Head of ORPA also emphasized the importance of all employees' understanding and commitment to SPIP. These constraints cause SPIP implementation to be suboptimal, especially in inventory administration and state property management. Husni suggested the need for regular training and additional security procedures based on risk evaluation.

In addition, the lack of awareness of organizational members about asset management is also an obstacle. Misran, another SPI member, stated the importance of active involvement of all employees in maintaining asset security as well as compliance with established policies. Collaboration and communication between organizational members are essential in SPIP implementation. Another issue is the inaccuracy of information in financial reports, caused by operator errors, data manipulation, and lack of data security. Misran also identified these risks and the importance of compliance with accounting regulations and standards. The lack of appropriate action against these risks makes the financial statements inaccurate, which impacts the BMN asset inventory procedure and keeps ORPA BRIN from obtaining a full WTP opinion.

Analysis of SPIP Implementation in ORPA BRIN

Based on initial observations at ORPA BRIN, there are several problems such as the administration of inventory items that are less orderly, output that has not been utilized, and management of state property that has not been optimal and financial reports that have not received a WTP opinion. This indicates that the implementation of SPIP in ORPA is not yet optimal. Triangulation results from interviews, document review, and observations show deficiencies in the elements of the control environment and control activities, especially in commitment to competence, the role of APIP, human resource development policies, and working relationships with related agencies (Kurnia, 2020). There is no documentary evidence to support the implementation and evaluation of training, and APIP performance has not been evaluated in detail. Apart from that, working relationships with stakeholders are not well documented. Weaknesses in control activities include a lack of SPI and APIP assistance in preparing financial reports, resulting in discrepancies in recording fixed assets. SPI and APIP are not yet optimal in control due to a lack of human resources and infrastructure.

Analysis of Factors that Influence the Implementation of SPIP in ORPA BRIN

Obstacles in ORPA BRIN affecting SPIP implementation include lack of human resource competence, inadequate facilities, low asset security awareness, and inaccurate financial reports. This aligns with previous research highlighting low-quality human resources and communication, absence of reward and punishment systems, and insufficient leadership commitment and understanding. Additionally, inadequate facilities, such as accounting information systems and security tools, hinder a good control environment (Gelinas et al., 2018). Effective leadership based on risk data is essential for managing risks according to regulations. Finally, incomplete financial reports indicate suboptimal SPI performance, requiring evaluation to enhance accuracy and transparency.

Development of a New SPIP Model

The existence of inhibiting factors in the implementation of SPIP at ORPA BRIN encourages the need for a new SPIP model that can overcome deficiencies and anticipate these inhibiting factors. However, the development of this new SPIP model must still refer to applicable regulations, such as Law Number 1 of 2004 concerning State Treasury, PP Number 60 of 2008 concerning SPIP, Presidential Regulation Number 16 of 2018, COSO standards, and several previous studies. The development of this new SPIP model is very important to ensure the effective and efficient achievement of organizational goals, the reliability of financial statements, safeguarding state assets, and compliance with the law (Malelea & Furqan, 2024). A good and correct implementation of SPIP is needed at ORPA, given the complexity and high level of risk in technology research and development activities.

Based on an analysis of the obstacles and factors that hinder the implementation of SPIP within ORPA BRIN, the new SPIP model that can be proposed for implementation in ORPA BRIN is as follows:

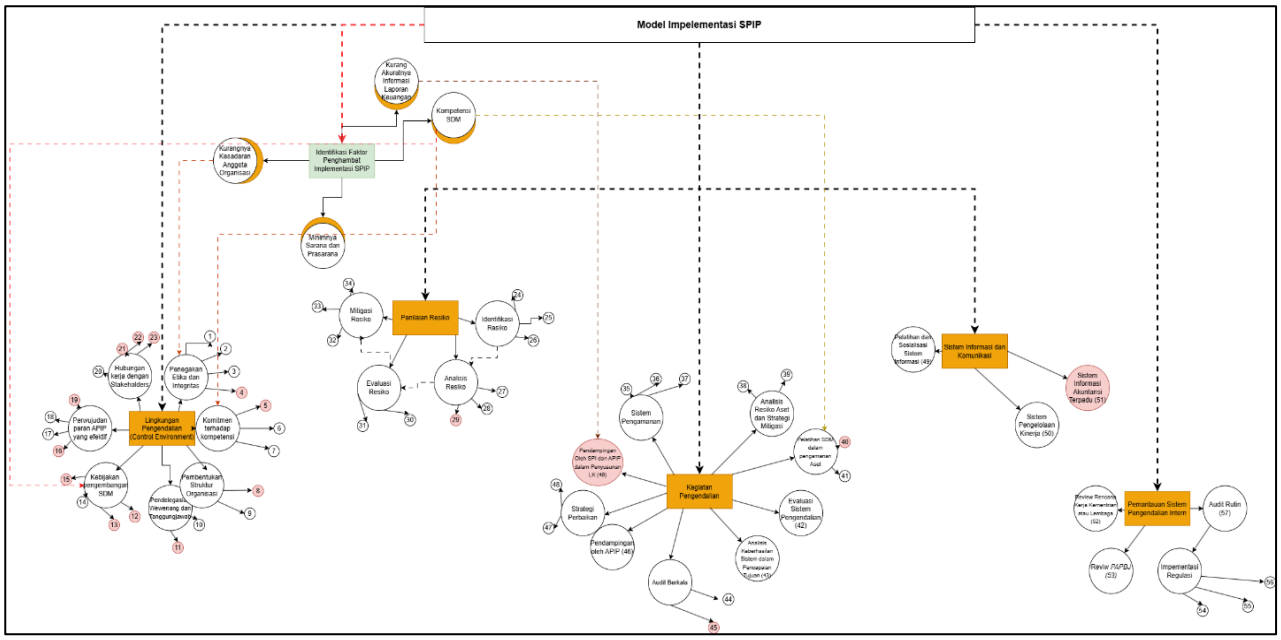

Figure 4 New SPIP Model

Source: Processed by researchers

The description of the codes from the model above is as follows:

Table 2. Description Model Explanation

Code	Explanation	Sub Elements	Element	Information
1	Carry out regular evaluations of each activity (research)	Enforcement of Ethics and Integrity	Control Environment	Long
2	Ensure that every member of the organization understands and obeys the code of ethics	Enforcement of Ethics and Integrity	Control Environment	Long
3	Ensure that every (research) activity prioritizes ethical standards	Enforcement of Ethics and Integrity	Control Environment	Long
4	Decree regarding the obligation of each member to follow ethics and integrity	Enforcement of Ethics and Integrity	Control Environment	New
5	Determination of decrees or regulations regarding commitment to competence	Commitment to competence	Control Environment	New
6	Regular Training and Socialization	Commitment to competence	Control Environment	Long
7	Application of Global Leadership Style	Commitment to competence	Control Environment	Long
8	The work unit team selection process is based on a merit system	Formation of Organizational Structure	Control Environment	New
9	Formation of 3 layers of organizational structure	Formation of Organizational Structure	Control Environment	Long
10	Form a technical work team	Delegation of Authority and Responsibility	Control Environment	Long
11	Decree on the determination of the technical work team along with their job description	Delegation of Authority and Responsibility	Control Environment	New
12	Determination of HR Development Strategy	HR development policy	Control Environment	New
13	Decree regarding HR development needs and policies	HR development policy	Control Environment	New
14	Routine Training Activities	HR development policy	Control Environment	Long
15	Evaluation of HR development activities	HR development policy	Control Environment	New
16	Preparation of APIP work plan documents	Realization of the effective role of APIP	Control Environment	New
17	RKA Review	Realization of the effective role of APIP	Control Environment	Long
18	Regular Audits	Realization of the effective role of APIP	Control Environment	Long
19	APIP Performance Evaluation	Realization of the effective role of APIP	Control Environment	New
20	List of stakeholder groups	Working relationships with Stakeholders	Control Environment	Long
21	List of detailed partner agency names	Working relationships with Stakeholders	Control Environment	New
22	Guide on maintaining relationships with partners	Working relationships with Stakeholders	Control Environment	New
23	Administration of documents related to activities with partners	Working relationships with Stakeholders	Control Environment	New
24	Understand the organizational context and objectives of preparing the LK	Risk Identification	Risk Assessment	Long
25	Look for conditions that could result in LK	Risk Identification	Risk Assessment	Long

Code	Explanation	Sub Elements	Element	Information
	reliability not being met			
26	Map all financial processes or transactions	Risk Identification	Risk Assessment	Long
27	Analysis of the Risk of Non-Achievement of Performance	Risk Analysis	Risk Assessment	Long
28	SWOT analysis as an analysis tool	Risk Analysis	Risk Assessment	Long
29	Asset Management Specific Risk Analysis	Risk Analysis	Risk Assessment	New
30	Comparing previous performance achievements	Risk Evaluation	Risk Assessment	Long
31	Risk Impact Measurement	Risk Evaluation	Risk Assessment	Long
32	Identify and select risk mitigation options	Risk Mitigation	Risk Assessment	Long
33	Planning risk mitigation efforts	Risk Mitigation	Risk Assessment	Long
34	Implement risk mitigation plans	Risk Mitigation	Risk Assessment	Long
35	CCTV	Security System	Control Activities	Long
36	Access control	Security System	Control Activities	Long
37	Other security procedures	Security System	Control Activities	Long
38	Risk analysis of assets	Asset Risk Analysis and Mitigation Strategy	Control Activities	Long
39	Develop mitigation strategies	Asset Risk Analysis and Mitigation Strategy	Control Activities	Long
40	Preparation of training needs and HR development strategies in asset security	HR training in asset security	Control Activities	New
41	Implementation of HR training and counseling regarding asset security	HR training in asset security	Control Activities	Long
42	Control System Evaluation (42)	Control System Evaluation (42)	Control Activities	Long
43	Analysis of System Success in Achieving Goals (43)	Analysis of System Success in Achieving Goals (43)	Control Activities	Long
44	Identifying Risks	Periodic Audits	Control Activities	Long
45	Implement corrective actions	Periodic Audits	Control Activities	New
46	Assistance by APIP	Assistance by APIP (46)	Control Activities	Long
47	Development of Improvement Strategies	Improvement Strategy	Control Activities	Long
48	Implementation of Improvement Strategies	Improvement Strategy	Control Activities	Long
49	Assistance by SPI and APIP in Preparing L	Assistance by SPI and APIP in Preparing LK (49)	Control Activities	Long
50	Information Systems Training and Socialization (50)	Information Systems Training and Socialization (50)	Internal Control System Monitoring	Long
51	Performance Management System (51)	Performance Management System (51)	Internal Control System	Long

Code	Explanation	Sub Elements	Element	Information
			Monitoring	
52	Integrated Accounting Information System (52)	Integrated Accounting Information System (52)	Internal Control System Monitoring	New
53	Review of Ministry or Institution Work Plans (53)	Review of Ministry or Institution Work Plans (53)	Internal Control System Monitoring	Long
54	Review *PAPBJ (54)*	Review *PAPBJ (54)*	Internal Control System Monitoring	Long
55	Minister of Finance Regulation Number 62 of 2023	Implementation of Regulations	Internal Control System Monitoring	Long
56	Law Number 1 of 2004	Implementation of Regulations	Internal Control System Monitoring	Long
57	Presidential Regulation Number 16 of 2018	Implementation of Regulations	Internal Control System Monitoring	Long
58	Regular Audits	Regular Audits	Internal Control System Monitoring	Long

CONCLUSION

Based on the research results, the conclusions from each research question are as follows: The implementation of SPIP in the ORPA BRIN environment is not optimal because there are deficiencies in the elements of the control environment, risk assessment and control activities. In the control environment element, there are deficiencies in the aspects of commitment to competence, human resource development policies, the effective role of APIP, and working relationships with stakeholders. Regarding the risk assessment element, ORPA BRIN has not carried out a specific analysis regarding asset management risks. In control activities, ORPA BRIN has not yet developed training needs and human resource development strategies as well as corrective actions for security and asset management problems. Factors that cause the implementation of SPIP in ORPA BRIN to not be optimal include a lack of human resource competency, supporting facilities and infrastructure, awareness of organizational members in securing assets, and inaccurate information in financial reports. Based on these constraints, this research developed a new SPIP implementation model for ORPA BRIN, which includes 16 new efforts to optimize SPIP implementation in their work environment.

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