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**“ОЦЕНКА СТРАТЕГИЧЕСКОГО УПРАВЛЕНИЯ ПЕРСОНАЛОМ
ЧЕРЕЗ ПРИЗМУ ОЦЕНКИ ЭФФЕКТИВНОСТИ – МНОГОМЕРНОЙ
СИСТЕМЫ ОЦЕНКИ ОРГАНИЗАЦИЙ С ВЫСОКОЙ СТЕПЕНЬЮ
НАДЕЖНОСТИ”**

**“EVALUATING STRATEGIC HR MANAGEMENT THROUGH THE
PRISM OF PERFORMANCE ASSESSMENT – MULTI-DIMENSIONAL
FRAMEWORK OF HIGH-RELIABILITY ORGANIZATIONS”**

1. Аннотация

Служебная аттестация - это один из основных инструментов, используемых организациями для оценки того, как осуществляется управление человеческими ресурсами, и определения того, насколько они соответствуют стратегическим или тактическим целям. В современных зрелых, высоконадежных организациях, для которых сбои в работе могут иметь самые серьезные последствия с точки зрения безопасности, экономики и социальной сферы, управление персоналом, как никогда, играет важную роль в достижении успеха. В этой статье рассматривается аспект оценки эффективности управления персоналом, охватывающий процесс оценки эффективности работы, показатели эффективности и то, как результаты оценки влияют на эффективность человеческих ресурсов (HR). Основываясь на новейшей литературе в области HRM (Управление человеческими ресурсами) и управления эффективностью, мы рассматриваем концептуально интегрированную перспективу, которая применяется к организационной среде НРО, такой как проект атомной электростанции.

Отсутствие такой взаимосвязи подчеркивает, что эффективность управления персоналом не может определяться только операционной эффективностью или индивидуальными критериями результативности. Необходима многогранная модель оценки эффективности, которая включала бы индивидуальные показатели эффективности, показатели, основанные на компетентности, а также поведенческие установки, ориентированные на безопасность, и эффективность на уровне системы управления персоналом. Результаты также свидетельствуют о том, что служебная аттестация значительно повышает эффективность управления персоналом, поскольку результаты оценки становятся частью других кадровых функций, таких как обучение и повышение квалификации, планирование персонала и постоянное совершенствование. Кроме того, доверие, справедливость и прозрачность систем оценки эффективности являются ключевыми факторами, влияющими на принятие и участие сотрудников.

В целом, исследование показывает, что измерение эффективности работы является комплексной оценкой эффективности управления персоналом в НРОС. Интегрируя проверки эффективности в стратегическую кадровую политику и процесс постоянной обратной связи, компании могут повысить надежность персонала, укрепить культуру безопасности и повысить общую устойчивость организации в долгосрочной перспективе.

Ключевые слова: Управление персоналом; Оценка эффективности работы; Эффективность человеческих ресурсов; Показатели эффективности деятельности; Высоконадежные организации; Культура безопасности; Постоянное совершенствование

1. Abstract

Performance appraisal is one of the main tools used by organizations to measure how human resources are managed and identify how they have been aligned with the strategic or tactical objectives. In today's mature, high-reliability organizations those on which operational failure can have the most serious safety, economic, and social impacts managing people is as instrumental in their success as ever. This article explores the aspect of performance evaluation in assessing staff management effectiveness, covering the process of performance assessment, performance measures and how assessment results lead to human resource (HR) effectiveness. Based on recent literature in the fields of HRM (Human Resource Management) and performance management, we take a conceptually integrated perspective, which is being applied to a HRO organizational environment – such as a nuclear power plant project setting.

The failure of this relationship highlights that the effectiveness with which personnel are managed cannot be determined by operational efficiency or individual output criteria alone. A multi-faceted performance assessment model is needed, that includes individual performance measures, competency-based measures as well as behaviorally and safety-focused attitudes, and HR system level effectiveness. Results also suggest that performance appraisal significantly adds to the effectiveness of personnel management by making evaluation results a part of other human resource functions, such as training and development, manpower planning and ongoing improvement. Furthermore, the credibility, fairness and transparency of performance measurement systems are found to be key factors that affect employees' acceptance and participation.

In general, the research reveals that performance measurement is a comprehensive evaluation variable for personnel management effectiveness in HROs. By integrating performance checks into strategic HR policy and the process of ongoing feedback, companies can increase workforce dependability, build a stronger culture of safety and bolster overall organizational sustainability in the long-term.

Keywords: Personnel Management; Performance Assessment; Human Resource Effectiveness; Performance Indicators; High-Reliability Organizations; Safety Culture; Continuous Improvement.

2. Introduction

As a prominent method to evaluate how effectively the personnel management is carried out in an organization, performance assessment has become exceedingly important. Amidst heightened technological complexity, regulatory scrutiny and stakeholder expectations, firms seek to encourage HR functions to deliver more than administrative efficiency and add strategic value in terms of organizational performance and viability. Recent HRM research argues that performance appraisal systems are a key mechanism to facilitate the alignment of individual behavior with organizational goals, increase accountability and promote evidence-based HR/HRM decision making (Aguinis & Burgi-Tian, 2021; Kuvaas et al., 2020).

For safety-critical and high-reliability organizations, such as those in the nuclear energy industry, the function of performance evaluation is even more important. Mistakes, lack of skills, and behavior outputs that are not compliant to convictions in these milieus can bring about fatal to environmentally drastic operational and social consequences. As a result, the effectiveness of personnel management in these organizations is significantly associated with such factors as the strength of performance appraisals (i.e., clarity of evaluation tasks, performance indicators' relevance and reliability of assessment procedures) (Bourrier et al., 2019; Kim & Park, 2022). Modern research claims that the performance assessment system is not just about labor productivity, but also work as a driver to develop learning and safety culture as well as the organizational salience when it is transparent, sound on competencies of each employee and oriented for development (Farndale et al., 2021; Ismail et al., 2023). Based on this, however, it can be concluded that many organizations are unable to systematically utilize results of performance assessment as a means for assessing the efficiency of their personnel management activities. That challenge is acutely felt in the context of large, technology-intensive projects which require diverse workforces, having a wide variety of specialized skills and against complex regulatory requirements, all demanding HRM systems (DeNisi et al., 2023).

In this context, study of the performance appraisal system and its usefulness in determining personnel management efficiency assumes relevance. It does so by drawing attention to the tasks of performance assessment, the indicators used to assess HR performance and how assessment results feed into HR effectiveness areas which have been identified in recent calls for more context-sensitive work that is cognizant of risk in evidence (Pulakos et al., 2019; Trento et al., 2022). The study is of importance for high-reliability organizations, where a well-functioning staff is crucial for maintaining high performance and success over the long term.

2.1 Background of the Study

Over time, HRM has grown from administrative tasks to become a strategic process integral to ensuring organizational sustainability. Performance appraisal is currently central to skill gaps analysis, performance contributions, and aligning employee performance and organizational performance objectives (Kuvaas et al., 2020; Aguinis & Burgi Tian, 2021). Sound performance appraisal systems assist inform promotion, staff development, and human capital planning activities, while flawed systems characterized by subjective ratings or inadequate feedback provide little value to organizational human resources management (Pulakos et al., 2019; Decramer et al., 2020).

In HROs, monitoring and assessing performance and competence, as well as behavioral issues, are crucial for ensuring safety and avoiding failures (Bourrier et al., 2019; Kim & Park, 2022). As stated in literature, there is little research to combine performance appraisal dimensions and HR effectiveness in large projects involving safety issues (DeNisi et al., 2023).

2.3 Objectives of the Study

The main objective of this study is to evaluate the effectiveness of personnel management through performance assessment in a high-reliability organization. Specifically, the study aims to:

- i. examine the key tasks and functions of performance assessment within personnel management;
- ii. identify relevant performance assessment indicators suitable for modern, safety critical organizations;
- iii. analyze the mechanisms through which performance assessment outcomes can be used to evaluate the effectiveness of the HR department; and
- iv. provide insights applicable to large, technology-intensive projects operating under strict regulatory and safety requirements.

2.4 Scope and Significance of the Study

This research is restricted to the level of workplace management effectiveness (workplace counter management HL2) as measured by supervisory rating procedures in a high reliability organization. The paper is conceptual and analytical, drawing on recent HRM and performance management literature with relevance to nuclear power project environment.

This study was of two-fold significance. Academically, the paper fills in a literature gap on HRM/FM effectiveness and performance measures in high ED risk cases (Farndale et al., 2021; DeNisi et al., 2023). Practically, this research offers HR practitioners and policy decision-makers with ordered rubrics for evaluating the effectiveness of HR to facilitate better decisions making, reducing risk and manpower development in complex and safety-critical organizations.

3. A Conceptual Framework for Personnel Management and Performance Evaluation

Study conceptual framework This study is guided by modern HRM theory, which depicts the management of employees and performance appraisal as mutually support components of a broader system of management. Personnel management underpins the structure and strategy of human capital management (HCM) whereas performance appraisal is used as a diagnostic tool of contribution, behavior and competence to the Organization given shape by evaluation. Integration is vital for ensuring efficiency, accountability and sustainability in contemporary organizations, especially those working in complex and high-risk areas.

3.1 Personnel Management in Modern Organizations

The world of HR and personnel management in today's organizations has moved beyond such basic administrative functions as staffing, payroll, and compliance. Today, it is widely perceived as a strategic practice that directly impacts organizational performance, innovation and risk. Modern human resource management Contemporary human resource management (HRM) is fundamentally about ensuring that people contribute to, rather than detract from, the achievement of organizational goals through workforce planning and design, competency development, performance management guidance and employee engagement (Farndale et al).

Recent conceptual research emphasizes that efficient personnel management systems are built in terms of strategic integration, evidence-based decision making, and a learning orientation (Kuvaas et al., 2020). In technology-heavy and safety-focused industries, HR still can help keep regulators at bay, maintain standards of professionalism, and build a healthy culture. Accordingly, the success of personnel management should be judged by administrative effectiveness as well as its enhancement of employee ability, behavioral consistency, and long-range organizational repercussions (DeNisi et al., 2023).

3.2 Performance Assessment: Concept and Purpose

Performance appraisal is a systematic process for evaluating how well employees are performing their jobs when compared to the expectations that have been established. It is a central pillar of performance management systems and has both evaluative and developmental functions. On the evaluative end, performance appraisal is a foundation for personnel actions such as promotion, pay, and retention. Its developmental utility lies in its ability to pinpoint performance deficiencies and help guide training, coaching, and career development interventions (Aguinis & Burgi-Tian, 2021).

Recent work has stressed that good performance measurement stems from the multi-dimensionality of systems- covering both task performance, competencies and contextual behavior, as opposed to using only output measures (Pulakos et al., 2019). In high-risk organizational environments, the performance appraisal has a preventive and control component regarding behaviors or skill deficits that can create operation or safety risks. Hence, the purpose of performance assessment is more than maintaining personal evaluation; rather it should support organizational learning, risk reduction and strategic congruence (Kim & Park, 2022).

3.3 Performance Assessment within Human Resource Management

Performance evaluation fills a crucial role as the “missing link” connecting HRM practices and organizational performance within the broader HRM system. It offers a tangible indicator of how HR policies and practices staffing, development, and planning lead to employee performance. Performance assessment results are considered as crucial signs of HR department effectiveness because such outcomes indicate the quality of HR inputs and processes (Becker & Huselid, 1998; Farndale et al., 2021).

Recent HRM studies have stressed the need to link performance measurement with other HR activities in order to maximize their effectiveness. When their results are used to structure or inform development programs, succession planning and talent management, the process of performance assessment emerges as a strategic practice (Decramer et al., 2020). In the complex work happening within organizations, this enables HR to track readiness of present and future capability, encourage incremental learning, and prove its worth as a business partner toward achieving strategic objectives.

4. Tasks of Performance Assessment

4.1 Administrative Tasks of Performance Assessment

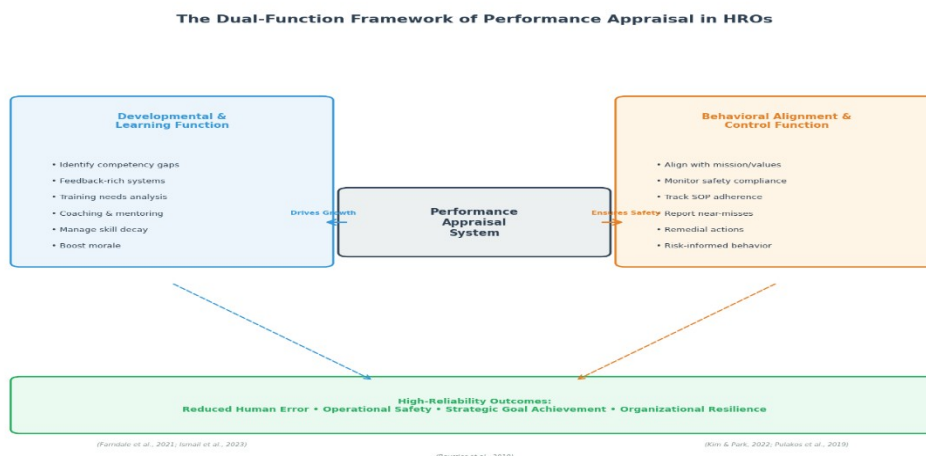
Performance assessment is one of key tools in making ratings and taking administration decisions on organizations. Performance appraisal outcomes are widely accepted as the formal input to determine promotion, salary revision, incentives/bonuses payment, job status (whether contract should be extended or terminated), and restructuring of employees. Objective and standardized assessment systems have been found to increase perceived fairness and legitimacy of these decisions, paving the way for increased trust in HR (Kuvaas et al., 2020). At large and complicated organizations, evaluation also has significance in the field of staff planning. The appraisal details assist HR managers to recognize top performers, employees with a critical skill set or who are in need of performance improvement. In safety-critical environments, such as nuclear power plants, administrative evaluation activities also comprise checks for suitability for safety-sensitive functions, certification status and legal compliance (Kim & Park, 2022). As a result, administrative performance review activities directly support both operational effectiveness and risk management.

4.2 Developmental and Learning-Oriented Tasks

Performance evaluation not only should, but has to go beyond administrative control in order that it plays an important developmental role as well supposed to improve employee and organizational learning. Current HRM literature has increasingly pointed out that such performance appraisals are most useful when they operate as feedback-rich systems to facilitate continuous learning and skill development, rather than one-off evaluation stage (Farndale et al., 2021).

Performance evaluation also indicates individual and team competency deficiencies, which influence training needs analysis and professional growth planning. In technology focused companies, periodic assessment of the technical and behavioral abilities very important to keep up with changes in systems and processes. Research also indicates that the implementation of training programs and coaching processes associated with performance appraisals improve employees' job performance, morale (Ismail et al., 2023).

In HROs, developmental assessment tactics are integrated with safety training, simulation activities, and re-certification programs. Over time, the performance-based assessment results can be used to drive learning efforts resulting in proactive skill decay management and reduced potential for errors attributable to humans (Bourrier et al., 2019).



Figure

4.2: The Dual-Function Framework of Performance Appraisal in HROs

4.3 Behavioral Alignment and Control Functions

Another function of performance appraisal is to tune the behavior of personnel towards mission, values and strategic goals of the organization. Performance evaluations also speak to acceptable behaviors, such as teamwork, communication, ethical behavior and following of safety policies. This alignment role is especially relevant in collective action and coordination features of the organizations (Pulakos et al., 2019).

In HROs, there exists a strong orientation towards behavioral alignment around the culture of safety, compliance to procedures and risk-informed behaviors. Performance measurement systems with behavioral and safety-related factors such as following the standard operating procedures, attending a safety workshop or reporting the near-miss accidents are control devices which induce appropriate behaviors (Kim & Park, 2022).

By closely monitoring and providing feedback, performance evaluation allows HRs to spot nonconformity to expected standards and take remedial measures. This control activity is not a means of exercising punishment; rather, it contributes to the robustness of the organization by safeguarding that personal behavior stays aligned with operational and safety considerations.

5. Performance Assessment Indicators

5.1 Individual Performance Indicators

Employee performance measures the level to which employees are fulfilling their assigned duties and obligations in time, quality, quantity, exactness or cost. These outcomes typically are the most observable dimensions of performance assessment and are often used to measure work-related consequences. Examples are performance goals, project timetables, error rates and output quality (Kuvaas et al., 2020).

Current research supports the continued use of specific performance-based criteria, but also underscores the need to link these indicators with more global organizational goals as a strategy to offset myopia or short-term focus on performance (DeNisi et al., 2023). Individual signals in high-reliability fields such as shipping might be, for example, rules compliance or documentation standards adherence that may have significant operational and safety consequences if violated. When systematically gathered, individual performance measures provide HR with the accurate data it needs to make sound administrative decisions and surface potential gaps in performance.



Figure 5.1: Linkage between Competency Assessment and Workforce Readiness

5.2 Competency-Based Indicators

These are your competencies based on your employees' knowledge, skills and abilities the amount of education or experience or expertise they need to bring." Differently from Outcome measures, competency indicators reflect performance potential and the skills readiness of the workforce. A recent HRM literature has focused on the rising significance of competence-based assessment in organizations that utilize technology to any extent, which makes necessary their employees to constantly upgrade their skills (Farndale et al., 2021).

Such indicators may include successful completion of training, certification and licensure status, performance on technical skill assessments, problem-solving skills and the like. Competency-based measures are especially crucial in safety-

sensitive industries, as inadequate professional ability and irrelevant knowledge may dramatically expand operational risk (Kim & Park, 2022). The ability to monitor competence indicators allows human resource management to assess the success of background screening and other hiring, training and growth efforts resulting in workers meeting organizational and regulatory standards.

5.3 Behavioral and Safety-Oriented Indicators

Behavioral and safety performance measures reflect the means by which employees do their job, in addition to what they complete. These metrics target behaviors consistent with organizational value, safety culture, teamwork, communication and ethics. Studies on high reliability organizations emphasize that behavioral traces are key to accident avoidance and operational robustness (Bourrier et al., 2019).

Typical behavioral and safety-specific measures include following procedures, attending training or emergency drills and reporting near-miss incidents; abiding by rules is also an indicator of good safety behavior. New research indicates that inclusion of such metrics into performance assessment promotes a pro-active safety culture and responsible employee behavior (Trento et al., 2022). For HR, they reveal cultural fit and risk-taking behaviors that are not picked up by standard performance measures.

5.4 Indicators of Human Resource and Organizational Effectiveness

Human resource and organizational effectiveness metrics measure the HR department and overall personnel management system, not individual employees. These measures capture the degree to which HR policies and practices are effectively related to positive workforce and organizational outcomes. These can include time-to-fill positions which are business critical, rates of employee turnover in pivotal roles, impact of training and the satisfaction levels from employees who have used HR services (Becker & Huselid 1998; Farndale et al., 2021).

This has gained increasing importance in recent research, which emphasizes the importance of HR effective indicators to evidence the strategic relevance of HR practices and represent the systemic barriers affecting personnel management (Decramer et al., 2020). Such indicators are expected, in complex organizational environments, to allow management to infer whether such HR systems effectively serve the operational needs and workforce stability requirements of an organization and contribute as well to its long-term performance. Joined with personal, competency and behavioral measures, the HR effectiveness metrics represent a well-rounded means to assess management's abilities as it relates to people.

6. Mechanisms for Evaluating the Effectiveness of Personnel Management

6.1 Integrating Performance Assessment Indicators

The first mechanism consists in the integration of performance assessment criteria at several levels of analysis. The individual performance, competency-based, behavior and HR effectiveness indicators should not be viewed as distinct systems of assessment but as part of an integrated framework for audit. Recent research indicates that integrating input optimizes the reliability and utility of performance assessment results (Pulakos et al., 2019).

In the field, indicators could be weighted based on organizational priorities in an integrated approach. For instance, there seem to be other indicators like competences or safety orientation (in safety-critical organizations) that may outweigh more on output ones. Performance scores and dashboards can then be aggregated for purposes of assessing employee performance with respect to, as well as the efficacy of personnel management practices overall. The inclusion of a systemic view allows HR departments to discern patterns of strengths and weaknesses conducive to evidence-based HR planning, as well as risk management (Farndale et al., 2022)

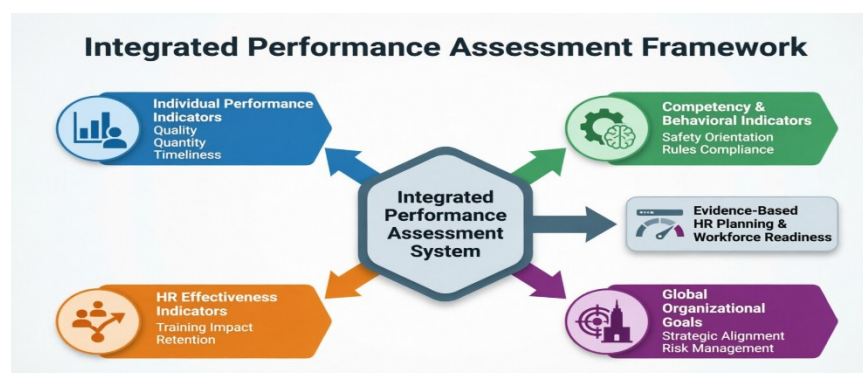


Figure 6.1: Integrated Performance Assessment Framework

6.2 Effectiveness Evaluation of the Performance Management System (PMS)

More than measuring individual and collective performance, organizations also have to check the effectiveness of their PMS process (performance management system). PMS efficacy is the extent to which a PMS accomplishes its goals (e.g.,

accurate measurement, fair assessment, clear performance standards and useful feedback).” (Aguinis & Burgi-Tian, 2021)

Recent studies reveal that PMS effectiveness could be assessed based on fairness of perception by employee and manager, across unit congruence, compatibility with organizational objectives and the extent to which appraisal result was used for HR decision support (Decramer et al., 2020). Assessing whether the system accurately captures safety-related behaviors and skills is also a component of PMS evaluation in HROs. Regular PMS auditing and stakeholder satisfaction surveying are suggested in order to continuously maintain the value and relevance of the system (Kim & Park, 2022).

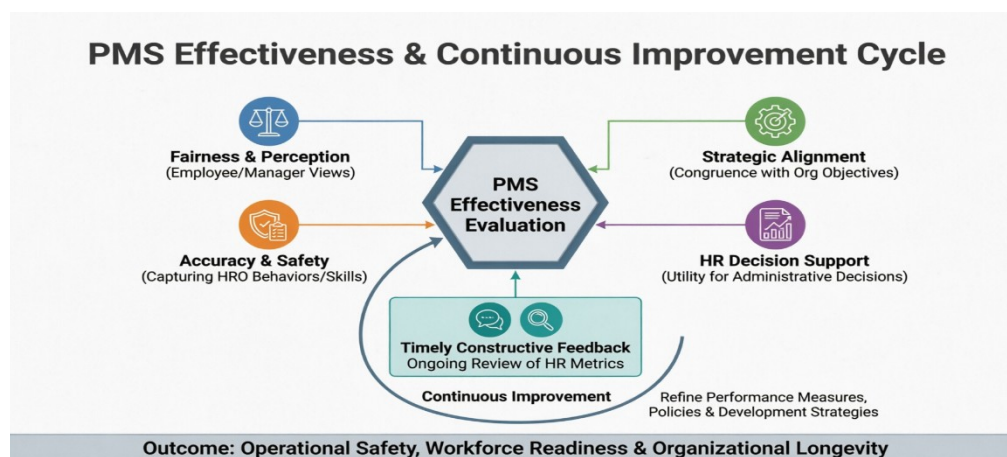


Figure 6.2: Continuous Improvement Cycle in PMS Effectiveness

6.3 Feedback, Monitoring, and Continuous Improvement

The last one highlights the conversion of evaluation outcomes to continuous learning. Appraisal An effective appraisal requires feedback loops that link the results of performance appraisal to corrective and development actions. Cited studies reveal how timely and constructive feedback is critical not only to objectively enhancing individual's job performance but also to strengthening organizational learning (Kuvaas et al., 2020).

Monitoring includes ongoing review of quality measures and HR metrics, as well as system-level outcomes. Monitoring key indicators allows HR departments to determine whether personnel management interventions (i.e., training programs or policy modifications) are having the desired impact. Ongoing refinement Continual improvement will occur when feedback and monitoring data are used in

a systematic manner to refine performance measures, HR policies, and employee development strategies (DeNisi et al., 2023).

In HROs, such feedback systems are especially critical for operational safety and readiness of the workforce. The key, however, is to ensure that personnel management systems evolve with advancing risks, technologies and regulatory requirements, or in a nutshell for perpetuating the long-term existence of an organization.

7. Organizational Context: Rosatom

7.1 Overview of Rosatom

Rosatom is a global leader in the nuclear industry, responsible for implementing a unified national policy in nuclear power utilization, the nuclear weapons industry, and nuclear safety. Its operations span the construction of nuclear power plants (NPPs), nuclear fuel cycle management, and the development of innovative technologies. The corporation's work is guided by a strong commitment to safety, which is considered the highest priority (HRM OF PP capacity, p. 79, 89; Human resource management as an element of PP, p. 1).

Being a High-Reliability Organization (HRO), Rosatom's core mission is the safe and reliable operation of its nuclear facilities. This mission is supported by a robust management system that integrates human resource development, safety culture, and operational excellence. The corporation employs around 420,000 people and is actively involved in large-scale projects both domestically and internationally, including the construction of 37 power units and 11 new NPPs. To support this growth, Rosatom has set ambitious workforce targets, needing to attract significant numbers of new employees (HRM OF PP capacity, p. 88-90; Human resource management as an element of PP, p. 1).

Human resource management at Rosatom is a part of an integrated management system, which is deemed essential for the safe development of its nuclear energy programs. The corporation has a well-defined HR structure and a comprehensive approach to workforce development (te_1364_web, p. 25; HRM OF PP capacity, p. 88).

Workforce Planning: Rosatom has developed an automated model for strategic human resource planning to address the challenge of staffing its large-scale

construction projects. This planning is crucial for ensuring the right number of qualified personnel are available at each stage of a project's lifecycle (HRM OF PP capacity, p. 88-89).

Talent Management: The corporation has a "robust system for education and training of employees" along three main tracks: managerial, expert, and project office competences. This is complemented by a tri-tier system for selecting and training succession staff, which gives them advantages in filling vacancies and participating in key projects (HRM OF PP capacity, p. 91).

Recruitment and Development: Rosatom actively collaborates with a consortium of 20 reference universities to recruit employees. For its employees, it offers broad opportunities for career development through achievement-oriented remuneration and various social programs. The Rosatom Academy and Rosatom Technical Academy provide training, with the Academy alone offering over 140 programs. Ongoing training is a key focus, with 107,670 employees undergoing training and professional development programs in 2016 alone (Human resource management as an element of PP, p. 1; HRM OF PP capacity, p. 89).

3. Performance Appraisal

Performance appraisal at Rosatom is a systematic process integrated into its core HR management practices. The corporation uses a competence model based on its industry values for recruitment, annual performance assessment, career planning, and succession management (HRM OF PP capacity, p. 91).

The RECORD Assessment: A key element of the system is the "RECORD-based assessment," which evaluates employees on multiple dimensions. In 2016, 43,809 employees underwent this assessment, which includes:

- Performance assessment based on Key Performance Indicators (KPIs).
- Assessment of professional and technical knowledge and skills.

- Assessment based on corporate values (HRM OF PP capacity, p. 90-91).

Incentives and Rewards: The system covers all levels of personnel and involves regular evaluation of performance results. The corporation aims to provide fair evaluation and encourages employees for improvement in production and economic performance through an incentive mechanism. WANO experts also review the performance of Rosatom's NPPs using more than 50 indicators to identify areas for improvement and maintain high safety standards (HRM OF PP capacity, p. 91).

4. Embedding Safety Culture

In line with its status as an HRO, Rosatom places a paramount emphasis on safety culture. HR activities are specifically designed to achieve and maintain the required levels of safety culture and personnel qualification (HRM OF PP capacity, p. 79).

Core Value: Safety is the highest priority, with the principle that "in safety there are no trifles". This commitment is embedded in the corporation's Code of Ethics, which establishes ethical principles for conduct related to occupational, industrial, and environmental safety (HRM OF PP capacity, p. 89; 543-Article Text-1970-2197-10-20200724, p. 6).

HR Integration: The corporation recognizes that systematic and versatile work with personnel is a key area of production activity that ensures the safety and reliability of nuclear facilities throughout their life cycle. This includes efforts to foster a "safe conduct culture" (HRM OF PP capacity, p. 90; 1-s2.0-S1876610219311956-main (1), p. 7).

Top Management Leadership: Senior managers demonstrate their commitment to safety by assuming personal obligations and being personally responsible for safety culture factors. They are also involved in auditing the safe behaviors of their staff (HRM OF PP capacity, p. 90).

8. Discussion and Analysis

8.1 Evaluation of Personnel Management Effectiveness

The utility of human resource management in a high-reliability organization may be judged by data-driven scrutiny of appraisal scores. The results of this study suggest that effectiveness in human resource management is demonstrated by the extent to which performance appraisal systems link individual with organizational accountability requirements, especially those related to competency assurance, behavioral consistency, and ongoing improvement. In safety-critical organizational environments, the management of personnel workers is more than the simple administrative side of a satisfied workforce (as Aguinis & Burgi-Tian, 2021 discussed): It is preparing labor for work, reducing risk and adhesion to safe behavior.

Performance measurement data indicate personnel management is successful when most employees regularly fulfill and preferably surpass predetermined performance objectives. Strong levels of completion accuracy, compliance with work/handling procedures and timely delivery of duties suggest that HR policies concerning recruitment and deployment supervision are matched to job requirements. Further, strong CB-assessment performance e.g., high training and certification compliance is indicative of PM systems' ability to sustain technical competence while reducing variable effort in HRHOs (Kuvaas et al., 2020).

Behavioral and safety-related performance parameters, also, support the assessment of management effectiveness. An escalating number of near-miss incident reporting or a pattern in the never events reporting, adherence to the same safety procedures for an extended period and engaging at every safety training session are examples that grounds for positivity towards a shared sense of purpose i.e. alignment between behavior and culture. Rather than being a sign of decreasing productivity, however, such patterns show that people are paying attention to risks and are supported by policies in human resources departments that foster openness and learning. It is well established that better personnel management leads to safer behavior at the organizational level by capturing behavioral indicators within our performance measurement systems (Reason, 2016; Bourrier et al., 2019).

Other possible signs of effective personnel management are system-based human resource effectiveness indicators including lower time-to-fill critical roles, the minimum turnover of employees in key positions and positive perception of fairness in appraisal by employees. These results indicate that performance test data is being used in a strategic manner for HR decision-making to form the basis

of workforce confidence and organizational trust. The presence of structured feedback and control represents evidence that human resource systems can translate assessment information into specific interventions or long-term improvement goals (DeNisi et al., 2023).

Taken together, the analysis suggests that the employee evaluation is an overall and comprehensive evaluating system of personnel management effect. Appraisal as justice and learning, and the normalization of feedback loops. When such multivariate indicators are combined, appraisal is experienced by the employees as fair and developmental feedback management, this contributes to an improvement in people management that goes straight to operational excellence (high reliability) and overall long-term organizational sustainability among other areas.

8.2 Challenges in Performance Assessment Implementation

Conspicuously, however, although performance assessment is strategically important in judging the effectiveness of personnel management, it potentially confronts many operational and systemic barriers within HRO's. A major challenge exists in the complexity of identifying performance indicators that readily measure task quality, technical competence, and safety-specific behavior. Quantitative Calibration and Qualitative Judgment: Using a highly technical measure for nuclear power projects could understate performance (if not all technical details were covered), while using qualitative judgments in excess might introduce bias and variability, as seen in Figure 2.4 (Pulakos et al., 2019). Balancing between objectivity and context sensitivity continues to be a challenge for HR professionals.

Another serious issue is subjectivity and rater bias in performance assessment. In addition to structured rating forms and criteria, personal impressions of raters, their position in the organization (reporting relationships), and background can impact ratings. It has been found out that these biases lead to the potential downfall of performance assessment systems by eroding their credibility and acceptability as measures for personnel management (Aguinis & Burgi-Tian, 2021). Biased evaluations can also mask competency deficiencies or behavioral concerns that present an immediate risk, particularly in safety-sensitive organizations.

Finally, there is a final hurdle to overcome with the incorporation of performance appraisal results into HR decision-making. In most places, the results of appraisals are captured in a formal sense yet they remain largely uncoupled from training planning, career development or policy changes. This gap hinders the developmental role of performance assessment and weakens its contribution to HR process effectiveness (Decramer et al., 2020). Organizations that seek high

reliability often are those where not only the assessment is closely linked to ongoing HR interventions, but also such integration requires a sophisticated information system and cross-functional commitment.

Resistance from workers and management also hampers effective implementation. In certain scrutinized and regulated environments, performance reviews can appear punitive or compliance-driven as opposed to developmental. When appraisal systems are not paired with honest communication and feedback, research finds that they often lead to anxiety and disengagement (Kuvaas et al., 2020). This resistance can erode the use of performance assessment as a vehicle for improvement.

Lastly, resource and capacity limitations can prevent the successful operation of performance assessment systems. The development, administration, and evaluation of performance-based assessments is resource intensive in terms of time, skilled evaluators, and systemic data. In large scale projects and with variety in job codes it is hard to maintain uniformity as well as quality of assessing performance. These challenges underscore the importance of an ongoing evolution in performance assessment strategies and practices that will better ensure their credibility, practical utility, and congruence with the goals of personnel management in (high reliability) organizations.

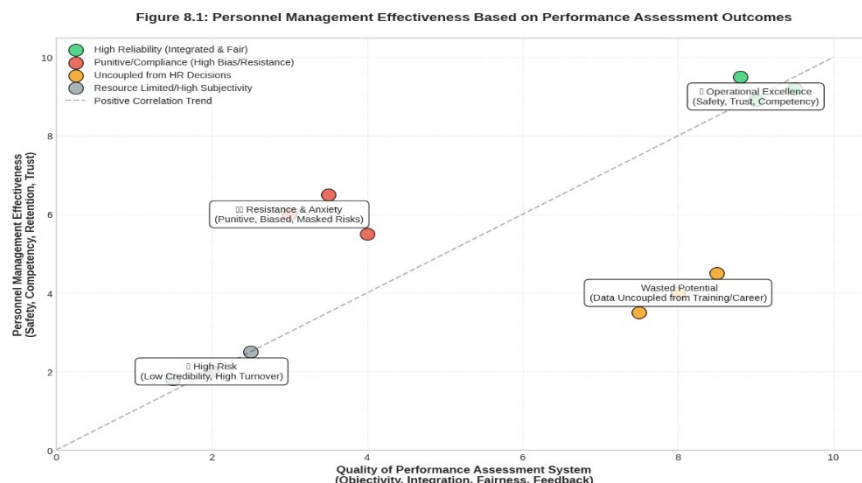


Figure 8.1: Personnel Management Effectiveness Based on Performance Assessment Outcomes

8.3 Implications for HR Policy and Practice

There are some lessons taken away regarding HR policies and procedures for HROs. First, performance appraisals should be considered an integral application of HRO management because they align large organizational objectives like safety, trustworthiness, and competencies among employees (Aguinis & Burgi Tian, 2021). Second, the HR department should apply more general performance appraisal systems, which take into consideration tasks, competencies, and behaviors, following strict policies to minimize subjective human errors (Reason, 2016; Kim & Park, 2022). Third, the performance outcomes of appraisals should be linked to staff training, development, and long-term leadership planning (Decramer et al., 2020; DeNisi et al., 2023). Fourth, fairness, transparency, and employee participation have been considered critical for trust development and candid feedback submission. Lastly, it is necessary for the HR department to frequently check these systems for continued appropriateness amidst changes and developments related to risks and policies.

9. Conclusion and Recommendations

9.1 Summary of Key Findings

The current research examined how performance appraisal could serve to better assess the effectiveness of personnel management in high-reliability organizations, such as nuclear power plants. The centerpiece of the argument is that performance appraisal is not just a paper-pushing exercise but a potent multi-dimensional weapon in a strategic arsenal. Its value derives from the integration of individual performance, competence, safety behavior, and human resource system measures that together provide a comprehensive view of the organization's human assets. In high-hazard organizations, competency-based and safety-based measures are most directly relevant because they bear directly on readiness and help to mitigate risk.

It also notes that perceived fairness of the process and perceived credibility of the development process has strong connections with employee buy-in and the utility of the system. At the end, if performance data are systematically linked with HR decisions such as training, staffing, and planning, appraisal becomes a strong driver for reliability enhancement, safety culture development, and the enhancement of long-term organizational robustness.

9.2 Managerial and Policy Recommendations

On the basis of the results of this study, a number of managerial and policy recommendations are suggested with implications for improving personnel management through performance assessment in general, particularly in high-reliability and safety-sensitive work organizations.

One, management need to institutionalize PA as a strategic management tool rather than dishing it up like a perfunctory administrative rite. A senior leadership has to ensure that the goals of performance assessment are strictly consistent with the aims defined in organizational strategy planning, with a corporate policy on labor safety and long-term management of personnel. At a policy level, this involves an explicit linking of the results of performance measurement to strategic decision making such as resource allocation, succession planning and risk management.

Second, employers must develop multilayered performance appraisal systems that include job-related performance, competency assessment, and behavioral- and safety-based indicators. Supervisors should be educated to use these cues more uniformly and objectively to minimize bias and improve the dependability of appraisal results. Clear evaluation criteria, including weightings (particularly for safety-sensitive positions), should be established in policy to align with both regulatory and operational demands.

The third point is organizations should reinforce the connection between performance evaluation and employee development. Performance appraisal results should feed into: training needs analysis, professional development plans and career progression routes. From a policy standpoint, this requires implementation of follow-up activities following appraisal cycles and allocation of adequate resources for tailored training and competence-building interventions.

4th, fairness, transparency and employee participation should be put first in managerial assessment for performance. Frequent feedback opportunities are available for employees, frequent open and transparent communication of expectations is a feature, mechanisms to ensure employee voice, all these could contribute to the trust in appraisal systems. HR guidelines should give absolute priority to procedural justice and provide mechanisms for review or appeal in order to preserve system credibility and employee involvement.

Third, organizations need to develop on going monitoring and auditing processes for performance management systems. Monitor the effectiveness of assessment tools and processes through spot checks, employee attitudes surveys and by analyses of performance data. At the policy and higher levels, such ongoing requirements for improvement have helped to ensure that performance assessment systems evolve in response to constantly changing business risks, developments in technology, and regulatory requirements.

On the whole, these management and policy suggestions underline the requirement for an integrated and evidence-based approach to performance evaluation. Organizations can enhance the effectiveness of personnel management and help establish sustainable performance in complex and high reliability operational contexts by integrating performance assessment into strategic HR policy and managerial practice.

9.3 Directions for Future Research

Given that few studies have examined the effectiveness of personnel management on performance assessment, this study purposely focused on conceptually and empirically testing such relations within a high-reliability organization context. First, scholars should take empirical research design to test the proposed model by means of primary data from employees, supervisors and HR managers. A stronger test of the causal direction in which performance assessment practices and its related satisfaction aid or hinder the effectiveness of personnel management might be addressed through model testing using surveys, structural equation modeling or multilevel analysis.

Moreover, cross-sector comparative research between various high-reliability industries—nuclear power, aviation, health care and chemical production in particular—may further increase the generalizability of findings. Such studies would serve to uncover sector-specific performance measurement measures and differences in context with respect to assessment of the effectiveness of personnel management. A cross-country or cross-organization comparison might also reveal the role of institutional, cultural and legal aspects on the performance appraisal systems.

Third, potential longitudinal impact studies related to the performance assessment in workforce capability, safety impacts and organizational resilience are recommended to be conducted. Such long-term studies would permit examination of the impact over prolonged periods of adopting a practice-based approach as well as a behavioral based assessments and its potential effects on learning, safety culture and staff retention. This would be especially useful in major construction projects that have long-term operating life.

Fourth, more research is needed on the role of digital technologies and analytics for performance monitoring. With the emergence of HR analytics, artificial intelligence (AI), and integrated information systems, new opportunities arise to increase the objectivity, real-time tracking, and predictive assessment of effectiveness in personnel management. There would be opportunity for a follow-up study that weighs benefits and ethical issues in these technologies on safety-critical applications.

Last but not least, qualitative research techniques (including interviews; case studies and the ethnographic approach) could offer further insight into employee and manager perception of PASs. An investigation of what this measurement is experienced as by organizational actors would prove useful, in addition to a more nuanced view on how performance assessment and interpretation are practiced within organizations.

In general, future research that takes these directions as a starting point will help lead us to better informed and balanced views of performance assessment as a tool for understanding and improving the effectiveness of personnel management in complex organizations.

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