

APPLICATION OF ISA 320: MATERIALITY IN AUDITING PRODUCTION COSTS AT THE SHURTAN GAS CHEMICAL COMPLEX

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ABSTRACT	KEYWORDS
<p>This paper examines the practical application of International Standard on Auditing (ISA) 320, "Materiality in Planning and Performing an Audit," in the context of auditing production costs at the Shurtan Gas Chemical Complex (SGCC), a major industrial enterprise. The study outlines the critical role of ISA 320 in ensuring the reliability and objectivity of the audit opinion, particularly its relationship with ISA 315 on risk assessment. The methodology involves establishing a preliminary materiality level by analyzing key cost components which are identified as high-risk areas for cost allocation and calculation. The paper details the calculation of these materiality levels and discusses the dynamic process of reassessing materiality throughout the audit. The findings confirm that a systematic application of ISA 320 enhances audit efficiency by concentrating resources on significant risk areas, which is essential for complex manufacturing environments like gas-chemical production.</p>	<p>Materiality, audit, production costs, risk assessment, audit planning.</p>

Introduction

In the domain of financial statement auditing, ensuring an objective and credible opinion is paramount. The International Standards on Auditing (ISAs) provide a robust framework for this purpose, with ISA 320, Materiality in Planning and Performing an Audit, serving as a foundational pillar [1]. Materiality is not merely a technical calculation; it is a concept of pervasive importance that influences the nature, timing, and extent of audit procedures. This paper aims to dissect and illustrate the application of this standard through a case study of the SGCC, a key entity in Uzbekistan's petrochemical sector involved in production of polyethylene (PE).

The audit of a large manufacturing enterprise like SGCC presents unique challenges, particularly in the valuation of inventory and the allocation of production costs. The complexity of chemical processes and the high volume of transactions create inherent risks of misstatement. Therefore, the correct application of ISA 320 is not just a matter of compliance but a critical tool for managing audit risk. This process is intrinsically linked to ISA 315: Identifying and Assessing the Risks of Material

Misstatement, as the determination of materiality directly informs the auditor's perception of risk and guides the subsequent audit strategy [2].

BRIEF INFORMATION ABOUT THE OBJECT OF STUDY

The Shurtan Gas Chemical Complex SGCC, part of the national holding company Uzbekneftegaz, is one of the largest and most strategically important enterprises of the oil and gas chemical industry in the Republic of Uzbekistan. Commissioned in the early 2000s, SGCC became a key link in the chain of deep natural gas processing aimed at producing high value-added products. The enterprise specializes in comprehensive natural gas processing, with an initial capacity of up to 4 billion cubic meters of raw gas per year.

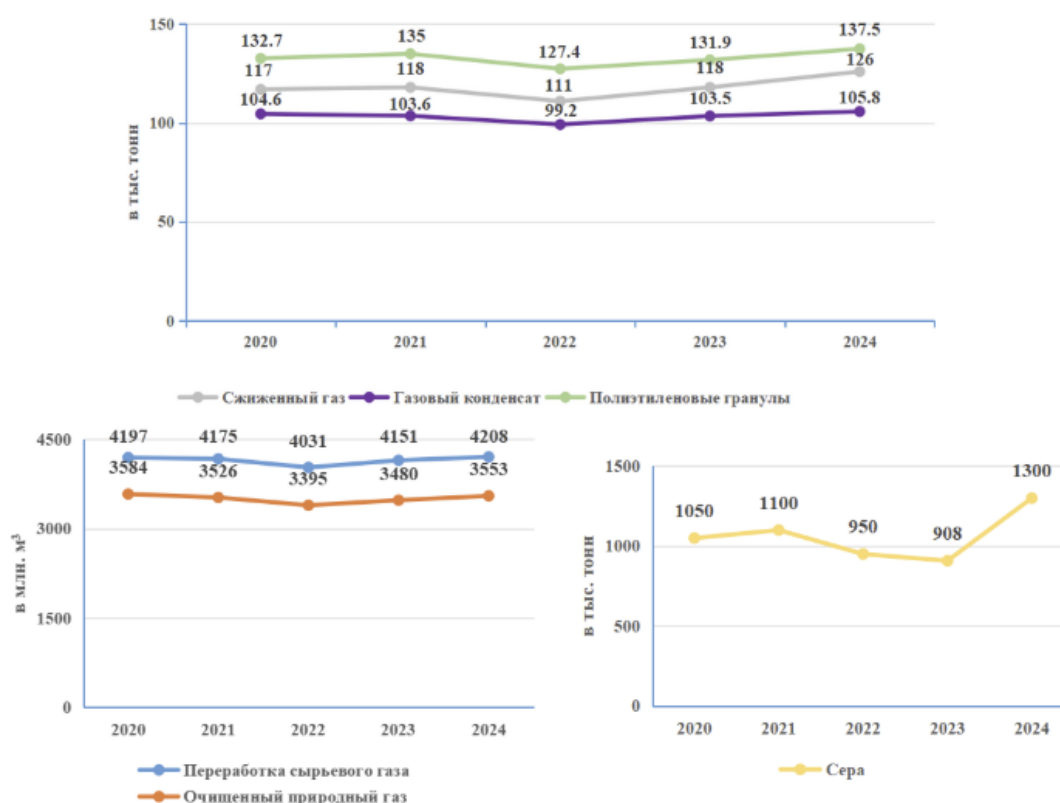


Figure 1 - Main directions of production in SGCC

Through a multi-stage technological process, including ethane extraction, pyrolysis, and subsequent polymerization, SGCC produces a wide range of products. The main type of finished product is polyethylene of various grades (high-density polyethylene and linear low-density polyethylene), with an initial design capacity of about 125 thousand tons per year. In addition, the complex manufactures liquefied gas, gas condensate, commercial methane, and granulated sulfur. These outputs contribute to the country's industrial development, energy security, and export potential.

Given the scale and economic importance of SGCC, the accurate accounting and auditing of production costs are essential. This study focuses on the application of International Standard on Auditing (ISA) 320 "Materiality in Planning and Performing an Audit" in the context of auditing production costs at SGCC.

CONCEPTUAL FRAMEWORK OF AUDIT MATERIALITY ACCORDING TO ISA 320

Materiality is defined from the perspective of the users of financial statements. Information is considered material if its omission or misstatement could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements. This concept acknowledges that financial statements cannot be expected to be accurate to the last cent; some level of imprecision is acceptable, provided it does not mislead stakeholders.

ISA 320 operates with several levels of materiality to guide the audit:

- Overall Materiality which is the maximum amount of misstatement that the auditor believes can exist without affecting the decisions of users.
- Performance Materiality set at a lower level to reduce the probability that the aggregate of uncorrected and undetected misstatements exceeds overall materiality.
- Specific Materiality established for particular balances or disclosures where lower thresholds are needed.

Materiality calculation begins with quantitative benchmarks but is finalized through professional judgment. Misstatements that are small in absolute value may still be qualitatively material (e.g., those that affect debt covenant compliance, turn profit into loss, or involve fraud).

METHODS

The methodological framework of this study is based on the requirements of ISA 320, which is closely linked to ISA 315 “Identifying and Assessing the Risks of Material Misstatement through Understanding the Entity and Its Environment.” The application of ISA 320 begins with setting the level of materiality, which determines the scope and focus of audit procedures.

The materiality level is calculated using the formula:

$$\text{Materiality Level} = \text{Base Indicator} \times \text{Percentage Materiality}$$

In accordance with international practice, the auditor selects one or more base indicators, applies threshold percentages (commonly 1%–2%), and adjusts them based on professional judgment. The selected base in this study is the total production cost of polyethylene at SGCC.

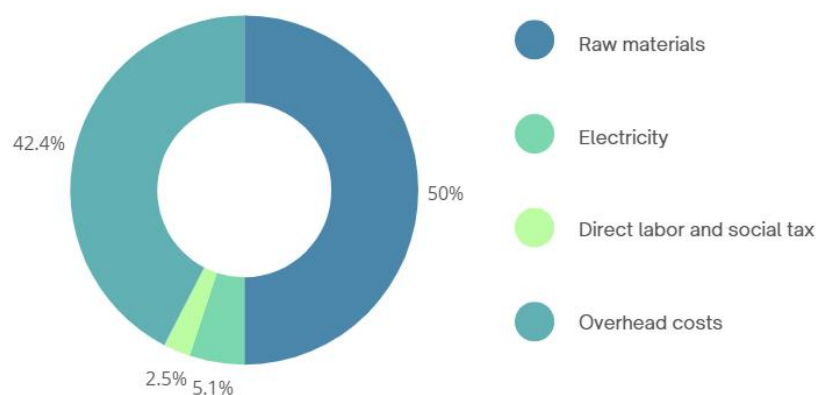


Figure 2 - The cost structure of polyethylene at SGCC for 2024

Data for the analysis were derived from cost accounting records for 2024, with a breakdown of major expense categories: raw materials and supplies, electricity, direct labor with unified social contributions (USC), and overhead costs.

RESULTS

The requirements of ISA 320 are directly related to the preceding standard and play a key role in ensuring the reliability and objectivity of the auditor's opinion. In the process of auditing production costs at the SGCC, the application of this standard begins with the determination of the materiality level, based on the characteristics of the audit object and the specifics of the industry, without which it is impossible to assess the risks of material misstatement under ISA 315. During audit planning, the level of materiality is adjusted taking into account the identified risks of material misstatement. The application of ISA 320 is divided into five main stages, which are illustrated in figure below.

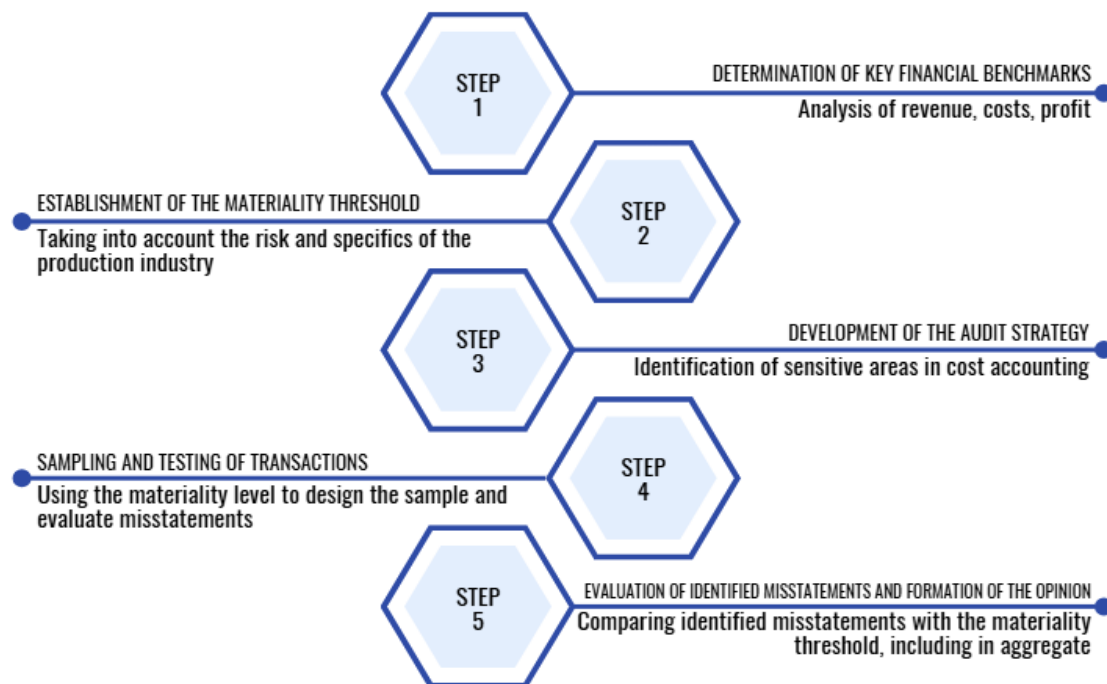


Figure 3 - Five steps of implementing ISA 320 while performing audit of cost accounting on SGCC

The figure demonstrates the five consecutive stages of applying ISA 320 in the audit of production costs. The process begins with the determination of financial benchmarks, which serve as the basis for assessing materiality. At the Shurtan Gas Chemical Complex, production costs are used as the primary benchmark due to their scale and volatility.

The next stage involves establishing the materiality threshold, typically set within 1–2 percent of production costs, taking into account the industry specifics and the level of audit risk. Based on this threshold, an audit strategy is developed that focuses on sensitive areas of cost accounting, such as the valuation of raw materials and the allocation of overhead expenses, thereby allowing auditors to concentrate resources on the most risk-prone areas.

The fourth stage is related to sampling and testing, where materiality levels define the scope and design of procedures used to verify transactions and detect potential misstatements. Finally, the identified errors are evaluated in comparison with the established thresholds, both individually and in aggregate, which enables the auditor to draw a conclusion on the reliability of financial statements and form an objective audit opinion.

The preliminary calculation of production costs at SGCC in 2024 showed the following structure: raw materials and supplies – 50.0%, overhead costs – 42.4%, electricity – 5.1%, and direct labor with USC – 2.5% (Table 1).

Table 1. Preliminary analysis of polyethylene production costs at SGCC for 2024

Cost Item	Amount (Billion UZS)	% of Total Costs	Explanations
Raw Materials	334	50.0%	Primary cost driver, high risk in valuation.
Electricity	34	5.1%	Moderately significant, risk in allocation.
Direct Labor & Social Tax	17	2.5%	Low financial materiality, but risk in compliance.
Overhead Costs	283	42.4%	Key factor in cost of goods sold, high risk in allocation methodology.
Total	668	100.0%	

After selecting the benchmark, the auditor uses professional judgment to apply a percentage. Industry guidelines often suggest ranges for different benchmarks. For a benchmark like total costs or revenue, a range of 1% to 2% is common.

In this case, a range of 1% to 2% is deemed appropriate, based on:

Risk Assessment: The high proportion of overheads (42.4%) suggests a significant risk of misallocation, justifying a more conservative (lower) materiality level.

Industry Practice: This range is consistent with practices in the oil and gas sector.

Group Audit Context: The chosen range aligns with the materiality level established for the parent company, JSC Uzbekneftegaz, ensuring consistency in the consolidated audit [4].

This calculation yields an overall materiality range of 6.68 billion UZS (1%) to 13.36 billion UZS (2%).

For detailed audit planning, these figures must be translated into practical targets for testing. Table 2 illustrates how the overall materiality percentage applies to individual cost components. This helps the auditor understand the potential magnitude of a material misstatement within each area.

Table 2. Calculation of materiality levels by cost benchmark at SGCC for 2024

Cost Item	Amount (Billion UZS)	1% Threshold (Billion UZS)	1.5% Threshold (Billion UZS)	2% Threshold (Billion UZS)
Raw Materials	334	3.34	5.01	6.68
Electricity	34	0.34	0.51	0.68
Direct Labor & Social Tax	17	0.17	0.26	0.52
Overhead Costs	283	2.83	4.25	8.50

Analysis and Determination of Performance Materiality The analysis of Table II highlights where audit effort should be concentrated. For example, a 2% misstatement in "Raw Materials" amounts to 6.68 billion UZS, which could arise from relatively small errors in pricing or quantity calculations. In contrast, a material misstatement in "Direct Labor" would require a much larger percentage error, making it less likely to go undetected.

To conduct the audit, the auditor would set a performance materiality level. A common practice is to set it at 50% to 75% of overall materiality. Assuming the audit team decides on an overall materiality of 10 billion UZS (a midpoint in the calculated range), they might set performance materiality at 7.5 billion UZS (75%). This lower threshold is used to design the sample sizes for tests of details and substantive analytical procedures, providing a buffer against the aggregation of smaller, individually immaterial errors.

DISCUSSION

The application of ISA 320 in auditing production costs at SGCC demonstrates the necessity of a flexible and risk-oriented approach. The predominance of raw material and overhead costs (over 90% of total costs) indicates a high probability of misstatements in cost allocation and calculation of production cost.

During the audit, the materiality level must be continuously reassessed based on new audit evidence. If deviations or indicators of fraud are identified, the auditor is required to adjust both the level of materiality and the scope of audit procedures.

Applying ISA 320 in this context not only ensures the reliability of financial statements but also enhances audit efficiency by allowing the optimal allocation of audit resources. This is particularly critical for complex gas-chemical enterprises, where production costs are multifaceted and highly material to financial reporting.

CONCLUSION

The case of SGCC illustrates the importance of applying ISA 320 in the audit of production costs. Setting and adjusting the materiality level, based on both quantitative and qualitative criteria, enables auditors to minimize the risk of undetected material misstatements. Moreover, such an approach enhances transparency, supports better decision-making, and aligns the enterprise's financial reporting with international audit standards.

REFERENCES

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