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## **ACTUARIAL PROFIT IN THE CONTEXT OF ECO-AUDITING**

**Abstract:** The efficiency of economic activity of organizations is currently not evaluated only by financial results, but is also determined by the environmental consequences of entrepreneurship. In this regard, the eco-audit is important, which ultimately provides a reasonable opinion about the environmental activity. The article discusses the improvement of information on the formation of actuarial profits, arising from the environmental performance of organizations in the context of eco-auditing. In particular, proposals are made for the accounting of future financial flows aimed at environmental activities at the present value, by which the environmental obligations of organizations are presented with more reliable estimates in the published financial reports. Accountability of environmental financial obligations at present value not only increases the credibility of the eco-audit conclusion, but also improves the financial audit carried out in organizations.

**Keywords:** actuarial profit, eco-audit, financial statements, environmental finance, financial audit

**JEL classification:** M40, M41

**Research aim:** to submit recommendations for improving environmental audit information provision.

**Research novelty:** suggested ways to improve the financial accountability of actuarial profit/loss estimated within the framework of eco-audit.

## **Introduction**

An actuary uses statistical and probability theory methods to make a scientific prediction of future economic results. And any forecast, and especially the expected economic consequences of long-term environmental activities, do not ideally correspond to the actual results of future cases and transactions. Therefore, the deviations of the actual economic results planned and formed by the actuary in the past are presented as actuarial profits or losses in the financial statements of organizations carrying out environmental activities [1]. Thus, the business principle of sustainable development obliges organizations to further restore used natural resources. Naturally, during the period of natural use, the organization should make a reservation of funds for the restoration of natural resources consumed as a result of business at the expense of expenses.

## **Research Results**

Here, a problem will arise for the reliable presentation of the reserve fund in the financial statements of the organizations, because the exact calculation of the duration of the possible restoration of the depleted natural resources contains a high probability [2]. If the organization manages to restore the natural

resources consumed as a result of business in a period not exceeding the actuarial forecasts and with minimal costs than planned, it will "save" the reserve fund aimed at environmental protection and thereby form an actuarial profit. In the opposite case, when the actuarial forecasts of restoration of depleted natural resources are underestimated both in terms of time and restoration value, then the organization will have an actuarial loss in terms of restoration of natural resources. In this sense, within the framework of the financial control system of environmental activity of organizations, actuarial evaluations are included, as a result of which the funds reserved for the purpose of environmental protection, as well as their further use and the determination of the final financial result, are counted and valued. In case of presentation of actuarial profit or loss of environmental activities in financial reports of organizations, a number of problems arise.

**First.** at the expense of the organization, during the years of construction of the hotel complex, a fund of environmental protection compensations is formed so that the obligation of the defined compensations is presented at the present value [3]. The demand for the present value assessment of defined benefits is presented by the RA Law on Accounting and IAS 1 standard, which pursues two goals: identify the organization's long-term responsibilities with the most realistic value (present value), which will make it possible, without exaggeration, to present the reserve fund for environmental damage compensation with the net amount (minus capital growth interest), not to attribute the amount of environmental damage compensation completely to the construction period costs, but to differentiate according to the present value and interest expenses, include the interest in the

expenses of the organization during the post-construction (operation) years of the hotel complex, and the present value of compensation - during the construction years [4].

Thus, let's calculate the present value of compensation for environmental damage due to the construction of the hotel complex with the help of 7,606 coefficients of 10% annuity for 15 years:

$$\text{annual future value of the payment} \times \text{annuity coefficient} = 4\,000 \times 6.145 = 24\,580$$

Then, let's determine the percentage cost included in the further compensation for the damage caused to the environment during the years of operation of the hotel complex:

$$4\,000 \times 10 \text{ years} - 24\,580 = 15\,420$$

Based on the requirements of financial reporting standards, the present value of future benefits is included in the costs of the organization for the years of construction work. And the interest expense included in the future benefits should still be postponed and recognized as an unearned interest expense so that it can be attributed to the expenses of the organization in the years of operation of the hotel (see table 1, column 3). As presented in table 1, the total amount of the present value of compensations for environmental damage (24580) and the interest expense not incurred (15420) is distributed equally between the 5 years of construction of the hotel complex. In this case, further compensations determined for environmental damage will be assigned to the expenses of the organization in a uniform and equal manner.

**Second.** during the construction, only the present value of the defined compensations for environmental damage is attributed to the expenses of the organization, and the remaining value of the

full compensations during the years of construction is formulated as an unearned interest expense in order to be attributed to the expenses of the organization in the following years of operation of the hotel complex. Such a time division of costs is provided by the current chart of accounts.

***Table 1. Disaggregated presentation of defined benefit plans by present value and interest payment (thousand, AMD)***

Years of construction	Creation of a compensation fund for environmental damage	Not incurred % cost	Present value of defined financial compensation
<b>1</b>	8 000	3 084	4 916
<b>2</b>	8 000	3 084	4 916
<b>3</b>	8 000	3 084	4 916
<b>4</b>	8 000	3 084	4 916
<b>5</b>	8 000	3 084	4 916
	<b>40 000</b>	<b>15 420</b>	<b>24 580</b>

Therefore, the tourist company will formulate in each financial year of the construction of the hotel complex.

when assigning the present value of defined plan benefits to the costs of the organization;

*DR 711 "Realization cost".....4 916*

*CR 426 "Present value of defined benefit obligations"...4 916*

When formulating the un incurred interest expense.

*DR 414 "Unearned interest expense".....3 084*

*CR 426 "On defined benefits present value of liabilities".....3 084*

Thus, account No. 414, acting as a contra passive, adjusts the balance of account No. 426, evaluating the reservation of benefits defined in it at the present value. Having formulated the account correspondence during the 5 years of construction, at the time of putting the hotel complex into operation, we will have the account items as follows:

<i>Value of defined environmental obligations".....</i>	<i>40000</i>
<i>Unearned interest expense .....</i>	<i>(15 420)</i>
<i>Present value of the defined benefit reserve fund.....</i>	<i>24 580</i>

During the years of operation of the hotel complex, the obligation to compensate for environmental damage is paid off in two installments: present value and interest expense. During the years of operation of the hotel, compensations for environmental damage during construction are compensated for this purpose from the reserve fund of compensations already accumulated during the years of construction, on the other hand, interest costs not incurred are gradually credited to the actual costs of the organization. In this case, for the purpose of evaluating the interest costs of each year of hotel operation, the environmental damage compensation is discounted by the present value factor related to the same year (see table 2, column 2). Therefore, compensation for damage to the environment during the post-construction period is formulated with the following correspondence:

The first year of operation of the hotel complex: when transferring environmental damage from the settlement account;

*DR 426 "Present value of defined benefit obligations"...4 000*

*CR 252 "Accounting account"...4 000*

when attributing the share of interest expenses not incurred to the actual expenses of the organization;

*DR 711 "Realization cost"..... 364*

*CR 414 "Unearned interest expense"..... 364*

The second year of operation of the hotel complex.

when transferring environmental damage from the account.

*DR 426 "Present value of defined benefit obligations"....4 000*

*CR 252 "Accounting account".....4 000*

when attributing the share of interest expenses not incurred to the actual expenses of the organization;

*DR 711 "Realization cost"..... 696*

*CR 414 "Unearned interest expense"..... 696*

Thus, during the 10 years of the operation of the hotel complex, by formulating the above-mentioned correspondences, the balances of accounts No. 426 and No. 414 will eventually become zero. However, in practice this is unlikely, as the actuarial estimate of the recovery time for environmental damage should generally deviate from the exact prediction.

If the restoration of the natural damage caused by the hotel complex takes more than 10 years, the organization will still be obliged to complete the environmental restorations, continuing the damages from the annual settlement account beyond the actuarially forecasted period, forming an actuarial loss in the balance sheet.

**Table 2. Discounting and presentation of defined benefit plans at present value and interest rate**

Damage compensation years	Present value coefficient	Loss compensation	Discounted amount of Compensation	Interest expense
<b>1</b>	0,909	4 000	3 636	<b>364</b>
<b>2</b>	0,826	4 000	3 304	<b>696</b>
<b>3</b>	0,751	4 000	3 004	<b>996</b>
<b>4</b>	0,683	4 000	2 732	<b>1 268</b>
<b>5</b>	0,621	4 000	2 484	<b>1 516</b>
<b>6</b>	0,564	4 000	2 256	<b>1 744</b>
<b>7</b>	0,513	4 000	2 052	<b>1 948</b>
<b>8</b>	0,467	4 000	1 868	<b>2 132</b>
<b>9</b>	0,424	4 000	1 696	<b>2 304</b>
<b>10</b>	0,386	4 000	1 544	<b>2 456</b>
		40 000	24 576	<b>15 424</b>

Otherwise, when the environmental restorations stipulated by the contractual obligations are completed in a shorter time than the actuarial forecasts, the organization will stop the defined planned environmental compensations, and performing "economy" will form an actuarial profit.

During the construction of the hotel complex, after the restoration of the ecological balance of the lake and the surrounding forest cover, in case of deviations of the actual and planned compensations, the actuarial profit (loss) is formulated. the balance and the restoration of the surrounding forest cover will take place two years later than the actuarial assessments, that is, during



the 12 years of operation of the complex, then an actuarial loss will occur and for each additional year it will be formulated:

*DR 427 "Actuarial profit (loss)" .....4 000*

*CR 252 "Accrual account" .....4 000*

Otherwise, when the restoration of the damage done to nature is completed 2 years earlier than the actuarial forecasts, that is, during the 8 years of operation of the hotel complex, then by writing off the balances of accounts No. 414 and No. 426, an actuarial profit will be formed with the following correspondence:

*DR 426 "On defined benefits present value of liabilities"...4,000 (4,000 x 2)*

*CR 414 "Unearned interest expense"....2 008  
(1052 + 956)*

*CR 427 "Actuarial profit (loss)" .....1 992*

### **Conclusion**

When the balance of actuarial profit or loss in the financial statements of the organization carrying out environmental activities increases, then according to the following years, they are written off part by part, on the account of expenses or income [6].

Thus, the application of the actuarial results evaluation mechanism of environmental activities, on the one hand, provides an opportunity to manage the economic risks of environmental activities, and on the other hand, creates preconditions for a more credible presentation of environmental obligations in the financial statements of organizations [7], which is extremely important when making managerial decisions in the field of natural use.

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## **ԱԿՏՈՒԱՐԱՅԻՆ ՇԱՀՈՒՅԹԸ ԷԿՈԱՌՈՂԻՏԻ ՀԱՄԱՏԵՔՍՈՒՄ**

**Բանալի բառեր** – ակտուարային շահույթ, բնապահպանական աուդիտ, ֆինանսական հաշվետվություններ, բնօգտագործման ֆինանսներ, ֆինանսական վերահսկողություն

Կազմակերպությունների տնտեսական գործունեության արդյունավետությունը ներկայումս չի գնահատվում միայն ֆինանսական արդյունքներով, այլ որոշվում է նաև ձեռներեցության բնապահպանական հետևանքներով: Այս առումով կարևորվում է էկոաուդիտը, որն, ի վերջո, ողջամիտ կարծիք է տրամադրում կազմակերպության տնտեսական գործունեությունից ձևավորվող բնապահպանական, ֆինանսատնտեսական հետևանքների մասին:

Մյուս կողմից, էկոաուդիտը ուսումնասիրում է նաև բնապահպանական միջոցառումներին ուղղված կազմակերպությունների ֆինանսական ռեսուրսների պահուստավորման և օգտագործման գործընթացը: Այս դեպքում, էկոաուդիտի կողմից քննարկման առարկա է դառնում ակտուարային շահույթի կամ վնասի ձևավորման հավաստիությունը:

Հոդվածում քննարկվում է էկոաուդիտի համատեքստում կազմակերպությունների բնապահպանական գործունեությունից բխող ակտուարային շահույթի ձևավորման տեղեկատվության բարելավումը: Մասնավորապես, առաջարկություններ են արվում բնապահպանական գործունեությանն ուղղված ապագա ֆինանսական հոսքերի ներկա արժեքով հաշվառման

ուղղությամբ, որով հրապարակվող ֆինանսական հաշվետվություններում կազմակերպությունների բնապահպանական պարտավորությունները ներկայացվում են առավել հավաստի գնահատումներով: Ներկա արժեքով բնապահպանական ֆինանսական պարտավորությունների հաշվետվողականությունը ոչ միայն բարձրացնում է էկոաուդիտի եզրակացության արժանահավատության աստիճանը, այլև բարելավում է կազմակերպություններում իրականացվող ֆինանսական վերահսկողությունը:

Հոդվածում ներկայացվում է նաև առաջարկություն՝ բնապահպանական գործունեությանը առնչվող ֆինանսական հոսքերի արժանահավատ բաշխման ուղղությամբ, որը հանգեցնում է ակտուարային շահույթի կամ վնասի հավաստի գնահատումների:

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