

RISK MANAGEMENT OF TOXIC HAZARDOUS SUBSTANCES TO IMPROVE OCCUPATIONAL SAFETY AND HEALTH UPTD DLH PURWAKARTA REGENCY

Suzana Marlianti¹, Widiya Avianti²

^{1,2}Management Study Program, STIE Wibawa Karta Raharja
¹wdythea@gmail.com, ²widiya.stiewibawakartaraharja@gmail.com

ABSTRACT

The purpose of qualitative research is to determine the implementation of risk management and K3 in B3 waste management at UPTD Environmental Laboratory DLH Purwakarta Regency. The source of this research data was obtained from the results of in-depth interviews with the main informant and supporting informants. Using SWOT research analysis (Strength, Weakness, Opportunity, threat) to show that risk management has been implemented thoroughly based on implementation in carrying out services documented in SOPs and Monitoring which is carried out every three months. The application of K3 is in accordance with Permen-LHK No. 23 of 2020 concerning Environmental Laboratories. Obstacles in B3 waste management are inappropriate waste management due to lack of knowledge and certification competition owned by B3 waste managers. Therefore, a B3 waste management strategy was made with a SWOT analysis in the form of providing an education and training budget to obtain B3 waste management competency certification.

Keywords: Risk Management; Waste Management; Environmental Laboratories

INTRODUCTION

The laboratory is a place for the development of science through various research and experiments, using various types of chemicals and alternative energy sources to support other activities as well as a number of other supporting facilities such as water, gas, electricity and fume hoods (Amalia, 2020). UPTD Laboratory as a technical unit of the Environmental Office of Purwakarta Regency. Water and air quality testing services are provided by laboratories as providers of public services in the field of

environment. Activities carried out by laboratories generate liquid and solid waste. The waste from a lab can be quite different, with some substances being highly flammable, reactive, corrosive, explosive, or easily oxidized. These can be very harmful to the environment. Such waste is categorized as hazardous waste.

Waste generated by the laboratory includes test sample residues, chemical residues after testing, expired or damaged chemicals, remaining consumables, washing laboratory equipment and others. Waste (B3) must be managed specifically as regulated in PP No. 22 of

2021 before being disposed of into the environment.

Tools, chemicals, lab equipment, and activities all have the potential to cause accidents (Amanah, 2021). Activities to ensure and protect workers' occupational safety and health through efforts to prevent work accidents and occupational diseases are collectively referred to as occupational safety and health (K3) according to Government Regulation of the Republic of Indonesia No. 50 of 2012.

Budgets are sometimes considered constraints in the application of risk management in an organization so that risk management is often not applied optimally. However, the organization must be able to protect all employees from all possible work risks they face, so that managerial or organizational leaders must be able to prioritize the work risks they face.

The purpose of the risk analysis in this study is to eliminate potential hazards associated with hazardous waste management in the laboratory to prevent occupational accidents. Personal protective equipment (lab coats, masks, gloves, and lab goggles), safety showers and/or eyewashes, appropriate types of fire extinguishers, sinks, alarms and/or

directions to exit the lab, first aid supplies for lab accidents and OHS equipment must all be present in the laboratory as well as compilation of Material Safety Data Sheet (MSDS).

IMPLEMENTATION METHODS

Qualitative research is the research design used in this study researching a fact or symptom and reality (Sugiyono, 2019), with methods that are in accordance with the research at the research object in the risk management analysis research on hazardous waste management at the UPTD Environmental Laboratory DLH Purwakarta office is about risk management in laboratory hazardous waste management at the UPTD Environmental Laboratory DLH Purwakarta office. The research subjects to determine information and provide the required data from the UPTD Environmental Laboratory DLH Purwakarta Regency are the Head of UPTD Environmental Laboratory DLH Purwakarta, Laboratory Technical Officer, Laboratory Analyst, and Implementation Staff. The data collection techniques used are observation and interview techniques and documentation, and data analysis techniques in formulating B3 waste management plans

at the UPTD Environmental Laboratory DLH Purwakarta office were analyzed using SWOT (*Strength, Weakness, Opportunity, threat*).

RESULT AND DISCUSSION

Based on the evaluation of the identification of internal factors of waste management at UPTD Environmental Laboratory DLH Purwakarta, the results are obtained as in the following table:

Table 1. Strength Assessment

No	Strength Assessment	Weight	Rating	Score
1	Vision and mission of the laboratory	0,24	4,5	1,07
2	There is a Standard Operating Procedure (SOP) in the management of B3 waste and K3	0,25	4,75	1,19
3	Availability of funds/financing in the management of B3 waste and OHS	0,25	4,75	1,18
4	Availability of TPS for B3 waste types	0,26	5	1,32
Total		1	19	4,76

Source: data processed by the author 2023.

In table 1. It is known that the weighting results and scores of internal strategic factors, that the greatest strength

is the availability of TPS B3, with a weight of 0.26 and a score of 1.32.

Table 2. Weakness Assessment

No	Weakness	Weight	Rating	Score
1	Officer knowledge level	0,2	2,75	0,62
2	Untrained human resources	0,2	3	0,73
3	Imperfect waste management	0,2	3,5	1,00
4	Long budget bureaucracy to treat waste	0,24	3	0,73
Total		1	12,5	3,09

Source: data processed by the author 2023.

In table 2, the biggest weakness internal strategic factor is imperfect waste management, with a weight of 0.29 and a score of 1.

Based on the total score between strengths and weaknesses, it is known that strengths amount to 4.76 while weaknesses amount to 3.09. The difference between strengths and weaknesses is 1.65, which means that strengths are more dominant than weaknesses.

Table 3. Opportunity Assessment

No	Opportunity	Weight	Rating	Score
1	Support from DLH	0,21	3	0,63
2	Availability of regulations	0,28	4	1,12

	on B3 waste management and K3			
3	Financial support from the government in equipping facilities for hazardous waste B3 management and K3	0,23	3,25	0,74
4	Cooperation with other parties	0,28	4	1,12
Total		1	14,25	3,62

Source: data processed by the author 2023.

In table 3. it is known that the weighting results and scores of external strategic factors, that the biggest opportunity is the availability of regulations on hazardous waste management and K3 and cooperation with other parties, with a weight of 0.28 and a score of 1.12.

Table 4. Threat Assessment

No	Threat Assessment	Weight	Rating	Score
1	Chemical exposure	0,38	4,75	1,81
2	Damage to laboratory equipment	0,34	4,25	1,45
3	Use of APD	0,28	3,5	0,98
Score		1	12,5	4,23

Source: data processed by the author 2023.

While in Table 4, the weighting results and scores of external strategic factors are known, that the biggest threat

is exposure to chemicals, with a weight of 0.38 and a score of 1.81.

Based on the total value, it is known that opportunities amount to 3.62 while threats amount to 4.23. The difference between opportunities and threats is 0.61, which means that the threat factor is more dominant than the opportunity factor.

Strategy Position in SWOT analysis (Rangkuti, 2015) Based on the results of the sum of the scores of internal and external factors above, the x-axis (internal factors) is 1.67 and the y-axis (external factors) is -0.61. So that the position of the strategy in the SWOT analysis is shown in Figure 1. below:

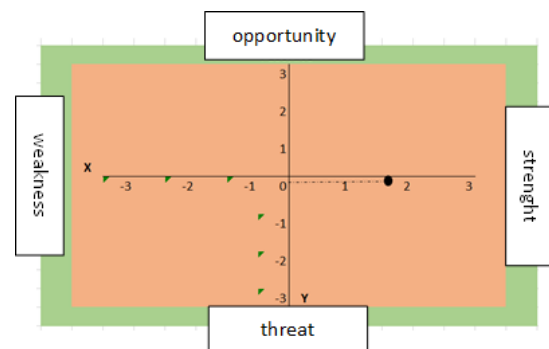


Figure 1. SWOT Quadrant Strategy Positions

Based on Figure 1, the position of the assessment of internal and external factors is in quadrant 2 (positive and negative) this position shows that strengths and threats have positive and negative values, meaning that this position shows that UPTD

Environmental Laboratory DLH Purwakarta in waste management has strengths, but will face a big threat if waste management is not in accordance with applicable regulations.

Some strategies that can be used in carrying out B3 waste management at UPTD Environmental Laboratory DLH Purwakarta to be optimal are seen in the following SWOT matrix:

SO (Strength-Opportunity) strategy by establishing cooperation with licensed third parties regarding B3 waste management at UPTD Environmental Laboratory DLH Purwakarta Regency, implementing regulations as a basis for achieving standard waste management goals in fulfilling facilities and infrastructure for B3 waste management and K3 and providing funds in B3 waste management both for facilities and infrastructure and for its human resources.

WO (Weakness-Opportunity) strategy by making PP 22 of 2021 the basis for managing B3 waste at UPTD Environmental Laboratory DLH Purwakarta and providing training to B3 waste management officers at UPTD Environmental Laboratory DLH Purwakarta Regency.

ST (Strength-Threat) strategy with budget availability for laboratory equipment repair and implementing SOP and regulations regarding hazardous waste management.

WT (Weakness-Threat) strategy by adding competent human resources in the field of hazardous waste management and coordinating with the program and finance sectors regarding budget provision in B3 waste management.

The field of programs and finance related to budget provision in B3 waste management. Waste-generating entities that play an active role in reducing waste that leads to the success of UPTD DLH Purwakarta include several types of waste and their treatment methods. The following are some types of waste and treatment methods:

- a. Solid Waste: Solid waste consists of polluting materials such as plastics, bags, clothing waste, paper waste, cables, and electricity. To deal with solid waste, some of the measures that can be taken include open dumping, segregation, and transport.
- b. Liquid Waste: Liquid waste, such as vinegar and wash water, can be generated by industries and other establishments. Liquid waste treatment involves handling and

- cleaning to reduce toxicity, infection, and chemical reactivity.
- c. Gaseous Waste: Waste gas includes all gaseous wastes from kitchen cooking, anesthesia, and generator operations. Gas waste treatment involves handling and cleaning to reduce toxicity, infection, and chemical reactivity.
 - d. Hazardous waste: Hazardous waste includes solid, liquid, and gaseous waste generated by human and industrial activities. To reduce hazardous waste, waste treatment and handling is required according to the type and source of waste.

Based on the position of the SWOT quadrant strategy, it is known that the selected strategy is the ST strategy which is carried out focusing on things:

1. Provide funds in the management of B3 waste both for facilities and infrastructure and for human resources. Based on the results of interviews related to B3 waste management funds at UTD Environmental Laboratory DLH Purwakarta Regency comes from the APBD funds of the Regional Government of Purwakarta Regency. Funds are budgeted for hazardous waste management, improvement of

laboratory hazardous waste management facilities and infrastructure as well as education and training of Laboratory human resources.

2. Making Government Regulation Number 22 of 2021 as the basis for hazardous waste management in laboratories. The existence of waste management guidelines based on Government Regulation Number 22 of 2021 concerning the implementation of environmental protection and management to prevent and reduce cross-contamination of analysis samples and B3 waste management officers.

So, to reduce waste that leads to the success of UPTD DLH Purwakarta, it is important to know the amount of waste generated and the waste must be classified based on its type to be used as a basis for consideration in determining waste treatment methods. In addition, waste management must involve collection from the source, sorting, storage, transport, and final treatment of waste generated from an activity.

CONCLUSION

B3 waste management at UPTD Environmental Laboratory DLH

Purwakarta, according to (Sekaran, and Bougie, 2017) the following conclusions can be drawn: (1) UPTD Environmental Laboratory DLH Purwakarta has carried out the implementation of risk management as a whole based on implementation in carrying out services documented in SOPs and monitoring carried out every three months (2) Obstacles in the management of B3 waste at UPTD Environmental Laboratory DLH Purwakarta, namely: inappropriate waste management due to the lack of knowledge and certification competencies possessed by B3 waste managers and the availability of budgets in B3 waste management. (3) The selected waste management strategy is based on the results of the SWOT analysis which shows the advantages in the strengths and threats of the UPTD Environmental Laboratory DLH Purwakarta. These strategies are providing funds in the management of B3 waste both for facilities and infrastructure and for human resources and making Government Regulation Number 22 of 2021 the basis for managing B3 waste in laboratories.

We recommend that in the management of B3 waste at UPTD DLH Purwakarta can provide a budget for

education and training for B3 waste managers, provide education and training for B3 waste managers to obtain competency certification for B3 waste managers, provide a budget for the repair of laboratory equipment and other operational costs, establish cooperation with third parties with permits from the Ministry of Environment in managing B3 waste, implement Government Regulation Number 22 of 2021 as the basis for managing B3 waste.

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