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EVALUATION OF DISASTER MANAGEMENT CONTINGENCY PLAN FOR INDUSTRY AT PT. XYZ GRESIK

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ABSTRAK
Indonesia mencatat 5.402 bencana alam pada tahun 2012, menurun menjadi 3.522 bencana alam pada tahun 2022. Selain bencana alam, bencana non alam seperti kegagalan modernisasi, kegagalan teknologi, wabah penyakit, dan epidemi juga terjadi. Bencana teknologi industri telah menjadi ancaman serius karena kurangnya tanggung jawab industri dalam pencegahan, yang seringkali mengakibatkan kerugian yang signifikan. Bencana industri yang umum terjadi antara lain kebakaran, pencemaran limbah B3, gangguan operasional, polusi asap, kegagalan fungsi teknologi, kebocoran gas beracun, ledakan, dan risiko yang berkaitan dengan penggunaan bahan kimia berbahaya. Insiden-insiden ini menyoroti kebutuhan mendesak akan perencanaan mitigasi bencana dan kesiapsiagaan darurat yang tepat, terutama di kawasan industri. Penelitian ini bertujuan untuk mempublikasikan rencana kontinjensi darurat untuk memitigasi kegagalan teknologi industri di PT. Kawasan Industri Gresik (KIG) pada tahun 2023 dengan menggunakan metode evaluasi CIPP (Context, Input, Process, Product). Penelitian ini menggunakan desain observasional deskriptif dengan pendekatan kuantitatif dan menggunakan sistem penilaian skala Likert. Penelitian ini menghasilkan variabel Context dengan total rata-rata sebesar 67,20 dan dikategorikan sangat baik. Variabel Input rata-rata sebesar 68,80 dan dikategorikan baik. Variabel Process rata-rata sebesar 61,23 dan dikategorikan baik. Variabel Product memperoleh total rata-rata 64,75 dan dikategorikan baik. Berdasarkan penelitian yang telah dilakukan, dapat disimpulkan bahwa contingency plan pada industri KIG tahun 2023 dalam keseluruhan bernilai 65,49 pada kategori baik dan terlaksana sebagai pedoman bencana industri dan apabila terjadi bencana contingency plan kegagalan teknologi industri menjadi rencana operasional diterapkan sebagai acuan tanggap darurat.

**Kata kunci : **bencana, manajemen, metode CIPP

ABSTRACT
Indonesia recorded 5,402 natural disasters in 2012, decreasing to 3,522 natural disasters in 2022Industrial technological disasters have become a serious threat due to the industry's lack of responsibility in prevention, often resulting in significant losses. Common industrial disasters include fires, hazardous waste pollution, operational disruptions, smoke pollution, technological malfunctions, toxic gas leaks, explosions, and risks associated with the use of hazardous chemicals. These incidents highlight the urgent need for proper disaster mitigation planning and emergency preparedness, especially in industrial areas. This study aims to publicize an emergency contingency plan to mitigate industrial technology failure in PT Kawasan Industri Gresik (KIG) in 2023 using the CIPP (Context, Input, Process, Product) evaluation method. This study uses a descriptive observational design with a quantitative approach and uses a Likert scale rating system. This research resulted in Context variables with a total average of 67.20 and categorized as very good. The average Input variable is 68.80 and is categorized as good. Process variables averaged 61.23 and were categorized as good. The Product variable obtained a total average of 64.75 and was categorized as good. Based on the research that has been done, it can be concluded that the contingency plan in the KIG industry in 2023 as a whole is worth 65.49 in the good category and is implemented as an industrial disaster guideline and in the event of a disaster the contingency plan for industrial technology failure becomes an operational plan implemented as an emergency response reference.

***Keywords* : ***disaster, management, CIPP method*

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INTRODUCTION

Preparedness is one of the disaster management mechanisms as well as an effort anticipate and reduce consequences of disaster risk.(Aprilin, H. 2018:20) Based on Law No 24 2007 Disaster Management, definition disaster management is emphasized disaster risk reduction efforts. Preparedness is important stage reducing the magnitude of the impact arising from a disaster. Preparedness in this case as preparedness resources for anticipating consequences technological failure disasters. (Haksama., *et al* 2022). National Disaster Management Agency (BNPB) 2020 the number of Indonesian disaster 2,939 incidents was dominated by floods (1,070 incidents), tornadoes (879 incidents) and landslides (575 incidents). The impact of the disaster more than 6.4 million people were displaced and 370 people died. Infrastructure affected more than 42 thousand houses and 2 thousand facilities (education, health, roads and bridges). BNPB assesses and validates disaster data 2021 for provinces, city districts, collected in 2021 there were 5,402 incidents, while in 2022 there were 3,522 natural disasters in Indonesia. (NR, T. D., *et al*, 2023).

BNPB January to July 2024 disasters dominated by forest and land fires became one of the natural disasters and the cause of non-natural disasters. Natural disasters and non-natural disasters are often interconnected and affect each other. Natural disasters earthquakes, floods and forest fires are the cause of the destruction of the infrastructure of industrial facilities. (BNPB, 2024). Technological disasters can be further subdivided into industrial (chemical spills, collapse, explosion, fire, gas leak, poisoning, radiation others), transportation (air, rail, road water) and miscellaneous accident (fire, collapse, explosion others). *New detik.com Bogor City - LPG tube packing 3 kilograms allegedly exploded (9/6/2024) in Paledang, Central Bogor, Bogor City. Seven people suffered burns as a result of the incident. Health crisis center - Cilegon chemical plant exploded on Wednesday (23/2/2022) morning at around 04.00 WIB. The explosion occurred at PT Mitsubishi Chemical Indonesia (MCCI), Cilegon, Banten. Initial Data obtained by the local health office coordinating the number of victims was informed that there were 6 minor injuries. Koran Tempo – Jakarta (31/03/2018) a crude oil spill pipeline owned by PT Pertamina (Persero) broke up in Balikpapan, East Kalimantan, adversely affecting the health of residents in the region. According to the Director General of law enforcement of the Ministry of Environment and Forestry. Rasio Ridho Sani, people complained nausea and dizziness after smelling the pungent smell of crude oil.*

Technological failures catastrophic incident caused by design, operation, negligence and human intent in use of technology or industry. Direct causes (triggers) of technological failures include fire, failure or error in safety design and operated procedures technological plants, component damage, nuclear reactor leakage, transportation accidents (land, sea, air). (BNPB, 2021).

Table 1. Potential Hazards of Technology Failure in East Java Province

No	Kabupaten/Kota	Bahaya				Kelas
		Luas (Ha)			Total	
		Rendah	Sedang	Tinggi		
A	**Kabupaten**					
1	PACITAN	392	0	0	392	RENDAH
2	PONOROGO	75	0	0	75	RENDAH
3	TULUNGAGUNG	13	0	0	13	RENDAH
4	BLITAR	12	0	0	12	RENDAH
5	KEDIRI	640	0	0	640	RENDAH
6	MALANG	320	0	0	320	RENDAH
7	LUMAJANG	1.158	0	0	1.158	RENDAH
8	BANYUWANGI	1.184	20	0	1.204	RENDAH
9	SITUBONDO	51	0	0	51	RENDAH

10	PROBOLINGGO	2.243	0	0	2.243	RENDAH
11	PASURUAN	1.629	0	0	1.629	RENDAH
12	SIDOARJO	4.149	0	0	4.149	RENDAH
13	MOJOKERTO	3.067	0	0	3.067	RENDAH
14	JOMBANG	14	0	0	14	RENDAH
15	NGANJUK	13	0	0	13	RENDAH
16	MADIUN	1.160	0	0	1.160	RENDAH
17	MAGETAN	337	0	0	337	RENDAH
18	NGAWI	407	0	0	407	RENDAH
19	BOJONEGORO	130	0	0	130	RENDAH
20	TUBAN	16.737	0	0	16.737	RENDAH
21	LAMONGAN	3.694	0	0	3.694	RENDAH
22	GRESIK	7.338	0	0	7.338	RENDAH
23	BANGKALAN	2.685	0	0	2.685	RENDAH
B	**Kota**					
1	KOTA KEDIRI	19	0	0	19	RENDAH
2	KOTA MALANG	37	0	0	37	RENDAH
3	KOTA PROBOLINGGO	45	0	0	45	RENDAH
4	KOTA PASURUAN	65	0	0	65	RENDAH
5	KOTA MOJOKERTO	294	0	0	294	RENDAH
6	KOTA MADIUN	44	0	0	44	RENDAH
7	KOTA SURABAYA	3.051	0	0	3.051	RENDAH
8	KOTA BATU	19	0	0	19	RENDAH
Provinsi Jawa Timur		51.022	20	0	51.042	RENDAH

Exposure to technological hazards isn’t just problem for industries urban areas or industrial state. Almost all modernization processes spread to almost all regions and social environments. Problems that occur include high use of hazardous flammable chemicals, limited fire resistance using fire-resistant building materials or equipment, the absence of fire buffers and smoke dispersal, the failure of detection and early warning systems, the absence preparedness plan in improving fire fighting, smoke suppression capability, limited socialization rescue plan employees and surrounding community in cooperation relevant agencies, challenges controlling storage capacity hazard and flammable chemicals, low safety standards in plant, equipment design (Kondashov et al., 2024), no anticipation possible hazards plant design and rescue operating procedures incident technological accident (Kusumaningrum et al., 2024).

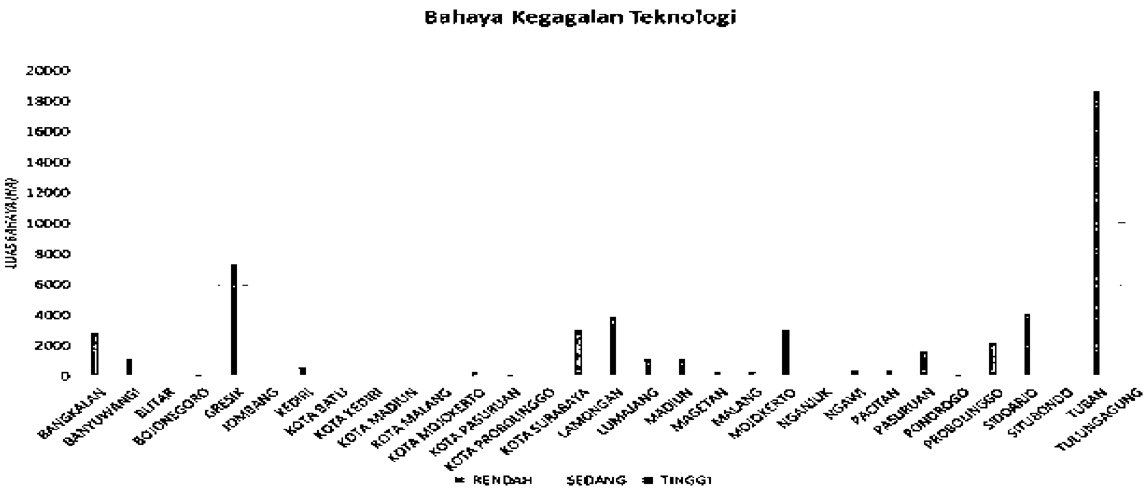

Figure 1. Graph of Potential Hazards of Technology Failure in East Java Province

The graph above shows distribution of the area of technological failure hazard East Java Province for cities affected by technological failure disasters. The district that has the highest

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area of technology failure hazard in the low class is Tuban district with area of 18,737 Ha. Meanwhile, Banyuwangi district is the only region that has the highest area of technology failure hazard in the medium class with an area of 20 Ha.

Table 2. Potential Population Exposure to Technology Failure Disasters in East Java Province

No	Kabupaten/Kota	Jumlah Penduduk Terpapar (jiwa)	Potensi Penduduk Terpapar (Jiwa)			Kelas
			Kelompok Rentan			
			Penduduk Umur Rentan	Penduduk Miskin	Penduduk Disabilitas	
1	JOMBANG	-	-	-	-	-
2	NGANJUK	889	78	167	1	TINGGI
3	MADIUN	35	56	122	4	TINGGI
4	MAGETAN	-	-	-	-	-
5	NGAWI	1.175	238	335	6	TINGGI
6	BOJONEGORO	-	-	-	-	-
7	TUBAN	3.800	472	916	24	TINGGI
8	LAMONGAN	5.489	710	671	10	TINGGI
9	GRESIK	2.562	391	997	9	TINGGI
10	BANGKALAN	1.685	245	835	3	TINGGI
B	**Kota**					
1	KOTA KEDIRI	-	-	-	-	-
2	KOTA MALANG	4.840	864	1.919	19	TINGGI
3	KOTA PROBOLINGGO	1.683	270	612	5	TINGGI
4	KOTA PASURUAN	-	-	-	-	-
5	KOTA MOJOKERTO	-	-	-	-	-
6	KOTA MADIUN	607	104	172	2	TINGGI
7	KOTA SURABAYA	5.158	1.007	1.258	22	TINGGI
8	KOTA BATU	-	-	-	-	-
Provinsi Jawa Timur		214.971	31.058	75.157	530	TINGGI

The Central of Statistics (BPS) East Java 2015 recorded 811,273. Recorded in 2023 there 11 industrial estates developing in East Java include Surabaya Industrial Estate Rungkut (SIER), Pasuruan Industrial Estate Rembang (PIER), Sidoarjo Industrial Estate Berbek (SIEB), Ngoro Industrial Park (NIP), Maspion Industrial Estate (MIE), Gresik Industrial Estate (KIG), Java Integrated Industrial Port Estate (JIIPE), Turban Industrial Estate (KIT), Safe n Lock Industrial Park, Sidoarjo Rangkah Industrial Estate (SiRIE) and Wira Jatim Industrial Estate. The International Federation of the Red Cross, estimated that between 1998-2007 nearly 3200 technological failures resulted in approximately 100,000 deaths and nearly 2 million people affected (WHO, 2009). This alarming data highlights the severe consequences of inadequate industrial preparedness and response. The phenomenon of technological disasters experienced by industries has become a growing concern for communities, largely due to the perceived lack of accountability and preventive action by industrial stakeholders (Manion & Evan, 2002).

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Such incidents often lead to massive economic, environmental, and human losses, further emphasizing the need for robust contingency planning (Shen et al., 2023). Indonesia should improve disaster preparedness in various sectors so as to anticipate natural, industrial, social and political disasters that can occur periodically in various places. Effective disaster management is crucial to minimize disruptions, protect human lives, and ensure business continuity (Ostadi et al., 2021).

Second disaster management system needed that responds quickly to disasters that occure. Contingency plan is a management used as an impact analysis aimed at organizing early steps in dealing with timely, effective and appropriate needs affected communities. Unfortunately, there is still ambiguity in the process due to differences interpretation understanding of the scope of the contingency plan approach in the context of disaster management. This study aims to evaluate the current disaster management contingency plan implemented at PT. XYZ Gresik. The findings will provide insights and recommendations for improving the plan to ensure greater resilience and sustainability in the face of potential disasters.

METHOD

The type research used descriptive research using an observational design with cross-sectional design through a quantitative approach. Likert scale method measure attitudes, opinions or perceptions towards program planning by giving each response numerical weight. Questionnaire use the answer options Strongly Agree = 4, Agree = 3, Disagree = 2, Strongly disagree = 1. Result retrieval is done used average. Average is value that represents set of data, average function important because it reflects the values in a set of data. The research focuses on evaluating the contingency plan implementation of PT XYZ in 2023. The evaluation method used is based on the CIPP method (Context, Input, Process and Product).

RESULT

Figure 2. Disaster Risk Map of Technology Failure in East Java Province

The figure above map of distribution technological disasters in East Java which focus East Java government contingency plan disaster management preparedness.

Figure 3. Map of Gresik Economic Zone

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Government Regulation (PP) Number 71 of 2021 concerning Gresik Special Economic Zone Regulates the establishment of Gresik Economic State located Manyar Regency, Gresik Regency, East Java Province.

Table 3. CIPP Method of Contingency Plan Gresik Industrial Estate (KIG)

No	Variable	Score	Result Category
1	*Context*	67,20	Very Good
2	*Input*	68,80	Very Good
3	*Process*	61,23	Good
4	*Product*	64,75	Good
Score Average		65,49	Good

Total average obtained through the weighting of the cipp method questionnaire on the contingency plan 65.49 with a good score category. This obtained in summation context, input, process product variables.

Table 4. The Results of The Context Variable Questionnaire Score PT XYZ

No	Variable	Score	Result Category
1	Risk and Incident Management	70,00	Very Good
2	Background	69,11	Very Good
3	Contingency Plan Barriers	62,80	Good
4	Preparedness Stages	70,60	Very Good
5	Government Support	64,50	Good
Score Averages		67,20	Very Good

Based the results of questionnaire assessment above, context variable of contingency plan preparation obtained score of 67.20, including very good category. The highest value obtained risk management, which 70.00, while the lowest value lies in the obstacles and constraints preparingcontingency plan, which is 56.00. There needs to be a review of obstacles barrier contingency planning because the preparation of contingency plans stages of equalizing the perceptions of disaster management actors, collecting data on disaster management sector administrative contingency plans.

Table 5. The Results of The Input Variable Questionnaire Score PT XYZ

No	Variable	Score	Result Category
1.	Administration and Finance	69,33	Very Good
2.	Leadership	73,20	Very Good
3.	Stakeholder Coordination	58,50	Good
4.	Quality Observation and	72,25	Very Good
5.	Accountability	70,50	Very Good
Score Average		68,80	Very Good

Based on results of questionnaire assessment above on the input variable in planning the preparation contingency plan, score of 68.80 was obtained in the very good category. Highest score was obtained leadership 73.20 while lowest stakeholder coordination was 58.50.

Table 6. The Results of The Process Variable Questionnaire Score PT XYZ

No	Variable	Score	Result Category
1.	Identification of Standard Operating	67,50	Very Good
2.	Procedure	65,00	Good
3.	Early Warning	58,67	Good
4.	Logistics	72,75	Very Good
5.	Human Resources	45,00	Less
6.	Resource Mobilization	58,50	Good
Score Average		61,23	Good

Based on results of questionnaire assessment above, process variable in planning and preparation of contingency plans obtained score of 61.23 category good category. The highest score was obtained by human resources 72.75, lowest score located resource mobilization 45.00. Resource mobilization capability leads to the potential and improvement of industry and community resources such as skills followed, funding, infrastructure facilities. Such skills followed, funding, infrastructure and facilities.

Table 7. The Results of The Process Variable Questionnaire Score PT XYZ

No	Variable	Score	Result Category
1.	Document *Contingency Plan*	64,75	Good
Score Average		64,75	Good

Based the assessment of product contingency plan variable questionnaire, 64.75 is obtained in the good category. The contingency plan of PT XYZis implemented preparation for the rapid response industry in event of an disaster emergency.

DISCUSSION

Context Variable

Risk Management

Risk is categorized in 4 parts including pure risk, a risk that if it occurs it will result in a loss. Particular risk as the risk occurs with individual sources of local impact, speculative risk. Risk and incident management is the main concern of the PT XY industry and contingency plan planning because risk management as identification of potential risks affecting industrial activities includes possible threats and opportunities that can occur. Risk management helps formulate contingency plans that specifically address the threat or opportunity realized. Incident risk management is carried out by building an OHS management information system monitoring the risk analysis of disasters at PT XYZand analyzing vulnerability to age and gender factors in the workforce. Risk analysis management is carried out disaster management planning begins with the introduction of disaster threat assessment disaster socialization community disaster assessment Disaster Management Plan documents with the creation of risk maps and evacuation route maps. DRR as an activity aims to reduce damage or loss caused by disasters (Nugroho *et al*., 2023). Simamora *et al*. (2023) stated that Kepmenkes Number 145 of 2007 Puskesmas at the sub-district level has role in formulating policies to minimize risk disaster events (disaster risk reduction) in its working area.

Background of Contingency Plan

Contingency Planning accordance with the provisions of Article 17 paragraph (3) of Government Regulation Number 21 of 2008 carried out preparedness to produce a Contingency Plan document, the contingency plan turns into an Emergency Response Operations Plan or Operations Plan (operational plan) through rapid assessment. Preparedness cycle contingency planning is one of the 9 (nine) activities in the preparedness stage. Reviewing the analysis preparation of the Disaster Risk Assessment document, there are disasters that have a high risk, especially PT XYZ include floods, extreme weather, earthquakes, fires, technological failures, droughts and traffic accidents. This was stated by respondent representatives in follow-up interviews as follows:

"Contingency plan disusun spesifik satu kejadian bencana salah satunya industri sering mengalami kebakaran dikarenakan lahan kosong dan kering." –Staff keamanan dan K3

"*Dua potensi bencana wilayah Kawasan Industri Gresik, yaitu Banjir dan bencana kerusakan lingkungan diakibatkan pabrik. Potensi bencana akibat kegagalan industri*

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Kawasan Industri Gresik sebagai Kota industri. Hal tersebut dikarenakan terdapat pabrik-pabrik dengan risiko tinggi proses produksi atau penggunaan alat."

Contingency Plan Barrier

Obstacles as hindrances; obstacles are defined as things that prevent program from being implemented due to internal and external factors. Total of 8 respondents (36.36%) stated that the contingency plan was lacking, 8 respondents (36.36%) were in the good category. Overall, the obstacles contingency plan planning are considered in the good category. The results of PT. XYZ research on barriers to contingency plan development lack of stakeholder support some view contingency plan risk management similar SOP or OHS activities by requiring time, resources, funding. Lack of resources, such time, funding, manpower or equipment. The contingency plan process is complex and takes time requires skilled and dedicated members, good funding and appropriate technology. Lack of coordination between departments, units or functions.

Preparedness Stages

Law Number 24 of 2004 concerning Preparedness is series of activities carried out in disaster emergency response with fast, precise and efficient procedures (Government of Indonesia, 2007). The legal basis Law Number 24 of 2007 concerning Disaster Management preparedness, early warning disaster mitigation, considering that PT XYZ has a high potential for non-natural disasters. Based on research conducted by Fahrimal, *et al*., (2019) preparedness is related to actions, activities, coordination communication carried out by all sectors to increase capacity face disasters. Disaster preparedness is a decisive and influential phase in changing the way of thinking and acting of communities in disaster-prone areas. In addition research by Novrikasari, N., *et al*., (2023) one form of preparedness is the creation of a disaster-prone map of ammonia gas dispersion needed to clarify evacuation areas alternative evacuation routes. Post-disaster reactive approach pre-disaster pro-active, preparedness, mitigation, prevention. This aims minimize damage, loss, trauma for the community and reduce loss assistance, rehabilitation reconstruction, vulnerability assessment efforts identify and analyze cost-effectiveness of interventions in protecting public health.

PT. XYZ disaster preparedness includes analyzing the potential impact, developing a warning system; maintenance and training of personnel, evacuation plans to face disaster risks, disaster counseling, greening in the land area, the formation of disaster teams or P2K3 in the industry as well as emergency signs such evacuation routes, emergency stairs and gathering point signs in KIG. Industrial tenants in KIG also build buildings according earthquake resistance as a form of earthquake disaster mitigation.

Government Support

Government and local governments responsible disaster management Law No. 24 of 2007 Disaster management includes establishing development policies at risk of disasters, disaster prevention activities, emergency response and rehabilitation. Results are in line with the research of Heryati, S. (2020) role local governments in overcoming disaster risk through BPBDs which are in accordance with the principles of disaster management, BPBDs have the authority to coordinate related parties organizing countermeasures. Rusli's research, R., *et. al* (2018) government's role in increasing community preparedness disasters through structural mitigation and non-structural mitigation. Preparation of the contingency plan of Gresik Regency local government is carried out by optimizing all resources owned by the Regional Government and ensuring that the needs of victims are met and protection vulnerable handling disaster emergency, coordination management of disaster emergencies is carried out by all government agencies, private sector, community and volunteers.

Input Variable

Administration and Finance

The results financial administration questionnaire XYZ contingency plan resulted average of 69.33 good categories, the observation results explained that PT. XYZ financial administration procedures preparedness, emergency response actions but has not run optimally. PT. XYZ conducts administration and finance archiving data on technical policy documents in the financial sector, budget plan preparation, prepare coordination of the implementation of tasks in the financial sector, prepares monitoring, evaluation and reporting in the financial sector. Contingency plan get funding assistance from the APBN, APBD, tenant industry businesses and independently. Funds obtained are used to implement the evaluation plan program. Funds provided industry used preparedness, early warning, preparation of contingency plans, training, provision emergency equipment.

Leadership

Contingency theory leadership is a process that involves the leader's ability to influence the group based on the situation at hand. It is important for leader to adjust the leadership style, personality approach according to the conditions of the group. The effectiveness of leadership depends on the leader's ability to adjust to the situation and dynamics that exist in the group (Sawitri, A. M., *et al* 2024: 17-24). Industry of PT XYZ is expected to protect the workforce, tenant industries with education, socialization and simulation of disaster management, disaster-prone area, disaster mitigation based development plan, infrastructure resilience, disaster financing and emergency needs industrial disasters.

Stakeholder Coordination

Results of the questionnaire explained as many as 5 respondents (22.27%) in the very poor category and 7 respondents (31.81%) in poor category and the Good category stakeholder coordination. Overall average produced a value of 58.50 in the good category. This is different from the research of Wahyudi, B., *et al* (2024) that the coordination of the Cimahi City BPBD government tends communicate with the DPKP and FPRB Cimahi City, the communication process is minimal with other parties, especially the private sector. Research by Murni *et al*., (2019) BPBD Padang City coordinates related agencies or institutions, namely the TNI, POLRI, BPBD West Sumatra province, DAMKAR, PUPR Office, social services, sub-districts, villages, rescue in handling regional countermeasures. Supported by research Purnama, I. N., (2024) pre-disaster stage has two activities; first, the Cilegon BPBD technology failure disaster management preparedness coordinates stakeholders the Cilegon city government, environmental services, social services, PMI, TNI or POLRI. The coordination creates a task force unit to overcome technological failure disasters.

Wardani's research (2020) in Haksama, S., *et. al* (2023) states that advocacy efforts need to be made to improve and maximize mitigation activities to national standards. So that collaboration of the role pentahelix elements is expected improve multihazard disaster preparedness in Banyuwangi Regency. It can be concluded that there needs to be cross-sectoral involvement involving the BPBD Gresik, Police, TNI, Environmental Service, fire department because Gresik is a regency in East Java Province known as the Industrial City because Gresik Regency is a large industrial area with a high level of non-natural disasters. KIG Industry also involves all internal employees regardless of division, the entire workforce has the role of the Emergency Response Preparedness Team (TKTD).

Quality Accountability Observation

Contingency Plan is prepared based on scenarios in each region related to potential for earthquake natural disasters. Renkon is activated an Operations Plan (Renops). Although

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Renkon has not yet been developed at the national level, several regions at the provincial and city district levels have developed it (As' at, M. M., *et al* 2024: 10). Average result of the questionnaire with a value of 70.75 in the good category explains the preparation of contingency plans in the industry refers to policies that contain disaster management. Based on the short-term disaster risk analysis of the Gresik Regency area, there is a threat of technological failure. Technological failure is expected to occur any time due to loading and unloading, fertilizer industry, cement and gas processing.

Scenarios for the developed contingency plans focus on 4 (four) urban villages with vulnerable areas that are directly adjacent to industrial management activities. The first is Manyar Tlogopojok Sub-district, which is located next to the chemical production area for fertilizers. The second is Ngipik Village in South Gresik Subdistrict, which directly borders the cement production area and is exposed to potential disaster risk. It can be concluded that there are 2 natural disasters that can cause industrial disasters and non-natural disaster include technological failures of PT Kawasan Industri Gresik (KIG) including natural, human environmental disasters. Disaster Recovery Plan (DRP) is a contingency plan run by KIG including disaster preparation and response, defined contingency plan development roles and responsibilities of stakeholders, assembly points.

The industrial disaster management system at PT Kawasan Industri Gresik (KIG) is structured into three mitigation levels. At the first level, when a natural or non-natural industrial disaster occurs, the affected industry is expected to handle the situation independently. The second level involves a zoning system, where a disaster affecting one zone and involving multiple industries requires a coordinated response, including support from external disaster management units such as SAR, fire departments (DAMKAR), and local police (POLSEK). At the third level, if the disaster cannot be managed through internal efforts or zone-based cooperation, the Regional Disaster Management Agency (BPBD) will step in to lead the disaster response in accordance with existing regulations.

Process

Standard Operating Procedure

Standard Operating Procedure (SOP) guideline containing stages, steps that exist organization. SOP are used to ensure decisions, complete, actions and process facilities carried out people in organization, effective, standardized and systematically. The results of the questionnaire as many as 8 respondents (36.36%) in the good category contained the KIG Industrial disaster SOP, overall average was 67.50 with very good category. PT. XYZ has structured disaster management prevention procedure for data collection, analysis and dissemination. PT. XYZ efforts to mitigate disasters include a quick and precise assessment of location (location disaster, number victims damage infrastructure facilities), damage resources, determining status of disaster emergency.

Early Warning System

Early Warning System information systems exist because of information on natural events and disasters. The results of the questionnaire 12 respondents (54.55%) stated that it was good that there was an early warning in the industrial area with an overall average result of 65.00 with very good category. PT. XYZ conducts an early warning system disaster information and risk management. This compares research conducted by Danil (2021) BPBD Singli City which has sirens or early warning signs. Utilization of early warning tools such as kentungan in the community, loudspeakers (toa) and bells in places of worship, and others. The observation results of PT. XYZ's industrial Standard Operating Procedures (SOP) reveal several key emergency preparedness measures. Fire extinguishers are provided to suppress small or early-stage fires in order to prevent them from escalating into large-scale incidents. Assembly point are designated as temporary evacuation areas during emergencies such as fires, earthquakes, chemical spills, and other natural or industrial disasters. Additionally, emergency exits are clearly marked and accessible to ensure safe and rapid evacuation during critical situations.

Logistic

Law Number 24 2007 article 27 BPBD has function coordinating implementation of planned, integrated and comprehensive disaster management. Head of the National Disaster Management Agency Number 3 of 2008 concerning the Establishment of BPBDs, one of main tasks Emergency and Logistics Division coordinate, command, and implement policies in field of disaster management during emergency response, handling refugees and logistics. Burden disaster-affected communities, the BPBD government mobilizes logistics of various resources face disasters that occur PT. XYZ disaster management preparedness, emergency response, recovery, rehabilitation, reconstruction.

Results of KIG logistics questionnaire were 6 respondents (27.28%) in the less category and 9 respondents (40.90%) in the Good category. The total average of the entire questionnaire is worth 58.67 good categories. PT XYZ has the readiness and feasibility of logistics warehouse in fulfilling resources. Results obtained are supported by research by Mimin, A., (2020) logistics contingency planning has 5 criteria that affect the logistics of Sulawesi Province has 5 criteria that affect the logistics of Central Sulawesi uncertainty, collaborative, human resources, infrastructure and funding, the priority is human resources. In contrast to research Faidah, A. D. N., (2024) logistics management implementation experienced obstacles, one of logistics management and very limited disaster equipment. Logistics management assistance at PT. XYZ has been running effectively, in accordance with applicable procedures and regulations. The logistics management process includes several key components such as inventory planning, data collection and mapping of industrial logistics availability and resources, identification of logistics needs for each industry within the Gresik Industrial Estate, and the development of a mobilization plan coordinated by KIG.

Human Resources

Human resources are the potential of every person to realize something and social beings, human resources as the ability thinking and physical power owned by individuals influenced environment. The results of human resources questionnaire were 12 respondents (54.54%) in the good category and 9 respondents (40.92%) in very good category. According to research conducted by DWulansari, D., (2017) Industrial human resources have a strategic role in improving the quality of performance in achieving goals. Research by Haksama, S., et. al (2023) good planning in terms of HR can provide an important role in performance in this case volunteer team and community disaster preparedness efforts.

Emergency response team of PT. XYZ has the competence of rescue capabilities such as helping accidents in industrial production units, fire extinguishing, accidents industrial areas handling emergency conditions. Company prepares the “Emergency Base” facility to function as a “Command Center”, so that in short time can access operational areas experience emergency conditions. KIG HR management team supported by the company to prepare rescue facilities in the form of rescue cars, ambulances and fire trucks, equipment in the form of fire extinguishers, fire hydrants and sprinkles, extraction equipment, fire extinguishers and fire trucks, production unit accidents, diving equipment, colapse structure rescue equipment medical evacuation.

Resource Mobilization

Resource mobilization participation community meetings, seminars, disaster preparedness training and skills related to preparedness. Resource mobilization is related disaster

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preparedness through technical guidance, provision of materials, funding, logistics, social network monitoring evaluation. Agencies or institutions send human resources, equipment and logistics, appointing representative who authorized to make decisions. The results of the questionnaire were 9 respondents (40.91%) in poor category and 9 respondents (31.81%) in good category on resource mobilization. The average questionnaire results resource mobilization indicator generated 45.00 in the deficient category. Accordance with research by Windusari, F. A., (2022) which states that the ability to mobilize resources related to land forest fire disaster preparedness includes human resources, technical guidance and provision materials, funding, logistics, evaluation monitoring social networks.

Training and Simulation

Regulation of the Head of the National Disaster Management Agency Number 4 of 2016 concerning Disaster Management Education and Training Article 1 Paragraph 4 disaster management training education as knowledge. Resource development efforts include implementation of training through the application technical guidance (technical guidance) on preparedness, one of which is a contingency plan.Results questionnaire 7 respondents (31.81%) in the insufficient category and 9 respondents (40.91%) in the good category of training and simulation. The average questionnaire results of training and simulation indicators produced 58.50 good categories. This is in accordance with research by Rimadeni, Y., Oktabina (2023) concluded that the implementation of disaster mitigation training activities of BPBD DKI Jakarta provides knowledge related to disaster mitigation through the delivery of theory and practice related to emergency first aid techniques.

Research by Utami, T. N. *et al* (2019) supports the success of training as a means changing knowledge and attitudes, determined by internal and external factors. Internal factors come from oneself including motivation, perception, willingness and needs. External factors come from outside such as the stimulus received, shape, color, size and uniqueness. PT. XYZ industry has team of Occupational Safety and Health Advisory Committee (P2K3) whose task is to monitor and implement the K3 Policy. One of the key development programs carried out by the P2K3 team is the provision of training for workers. This includes fire extinguishing and indoor hydrants training led by Fire Department K3 experts and the internal safety team, aimed at providing a thorough understanding before workers engage in field activites. Evacuation training is also provided indoors, led by the P2K3 team leader, focusing on evacuation procedures and the recognition of evacuation signs.

Product

Contingency plan document is prepared as guideline disaster management in KIG in accordance with the requirements, criteria and rules set. The results of the questionnaire 13 respondents (59.10%) in good category 4 respondents (18.18%) in very good category product results or contingency plan documents. The average questionnaire results of training and simulation indicators resulted in 64.75 in the good category. Management of PT. XYZ contingency plan mitigation plan as risk management and ensure the success of disaster prevention. Contingency plans are used alternately focused on 1 disaster and guidelines PT XYZ organize the interests of emergency response activities effectively when non-natural disasters such as land fires, technological failures and traffic accidents occur. Contingency plan document contains policies, strategies, operational steps to deal with situations of land fires, technological failures and traffic accidents for stakeholders.

CONCLUSION

The contingency plan for the KIG industry in 2023 as a whole is worth 65.49 in the good category and is implemented as a guideline industrial disasters and disaster occurs, industrial technology failure emergency plan becomes an operational plan that is implemented as a reference for emergency response. Context variable obtained a score of 67.20 is included in Very Good category. The highest score was obtained for risk management, which was 70.00, while the lowest score was obstacles and constraints preparing contingency plan, namely 56.00. Input variable obtained a score of 68.80, including the very good category. The highest score obtained for leadership at 73.20, while the lowest score was for stakeholder coordination 58.50. Process variable obtained a score of 61.23 in Good category. The highest value obtained for human resources was 72.75, while the lowest value was for resource mobilization at 45.00. Product variables the form of documents and legalization of contingency plan preparation obtained a score of 64.75 in Good category.

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