

## Fire emergency response system at PT X based on International Safety Rating System (ISRS)

Kharolina Fatimah\* and Meirina Ernawati

*Department of Occupational Safety and Health Faculty of Public Health, Airlangga University, Surabaya, Indonesia.*

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### Abstract

Fire is the unwanted occurrence of fire. Preparedness in the face of catastrophic fire events is part of the Occupational Safety and Health (K3) standards that must be implemented in the company. PT X is a company engaged in concrete manufacturing. In the production process, many potential hazards, such as fires, can cause losses. This research aims to study the fire emergency response system at PT X. The method used is descriptive research, with data collection done cross-sectionally. The analysis was carried out descriptively by clearly and thoroughly describing the condition of the object of study and comparing it with the applicable regulatory standards. The results showed that PT X had implemented a fire emergency response system and efforts to prevent and overcome fire hazards. PT X's efforts include forming a firefighting team providing fire hazard management facilities such as fire extinguishers, fire blankets, first aid kits, evacuation stretchers, and other infrastructure facilities. PT X has conducted fire emergency response and first-aid training for employees and workers. This research concludes that PT X has implemented an emergency response system well and refers to the International Safety Rating System.

**Keywords:** Emergency Response System; Preparedness; Fire Disaster; Prevention Efforts

### 1. Introduction

The growth and development of the manufacturing industry is in line with the increasing number of potential hazards that arise. One of the problems that occur in manufacturing companies is occupational safety and health problems [1]. The use of technology in the production process is intended to increase the speed at which consumer needs are met. This results in increased use of equipment, machinery, and hazardous materials due to the demand for and development of manufacturing technology [2]. The use of advanced technology that is not accompanied by appropriate control measures can hurt workers and companies. One source of danger arising from the production process in manufacturing companies is fire.

Fire is the unintended occurrence of fire. In addition, fire is a disaster or disaster that is most often faced. Fire is a high risk that can cause damage to buildings, death, cessation of production processes, and damage to the environment [3].

Preparedness is a series of actions to anticipate disasters by organizing the organization. Preparedness in the face of an emergency or disaster is a series of actions arranged to reduce the negative impact or loss that an emergency can cause. Preparedness in the face of a fire disaster is part of the occupational safety and health (K3) standards that must be implemented in the company [4].

PT X is a company engaged in manufacturing concrete. In the activities of the production process and production equipment at PT X many potential hazards are large and at any time can cause emergencies such as fire, explosions, and

\* Corresponding author: Kharolina Fatimah

various hazards that can hinder the production process. Therefore, it is necessary to have a fire emergency response procedure starting from preparation to countermeasures and recovery plans so that emergencies can return to normal.

The purpose of this research is generally to study the fire emergency response system at PT X. The specific research objectives are to study the fire emergency response system and efforts to prevent potential fire hazards at PT X.

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## 2. Material and methods

This research is a descriptive study with data collection conducted cross-sectionally. This research focuses on evaluating the implementation of the fire emergency response system and prevention efforts against potential fire hazards at PT X. The research was conducted in October-December 2023, while the data collection time was on November 4-15, 2023. The variables studied include policies, procedures, training, and communication in the emergency response system.

Data sources consist of secondary data obtained directly from the company and primary data involving field observations, interviews with relevant parties such as safety officers and emergency response team leaders, and documentation of the condition of the fire emergency response system as concrete evidence. The analysis is done descriptively by clearly and thoroughly describing the condition of the research object and comparing it with the applicable regulatory standards.

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## 3. Results and discussion

### 3.1. Potential Emergencies

In ensuring the continuity of all safe and smooth production activities, PT X requires excellent and early anticipation of emergencies or disasters. An emergency or disaster can cause loss of life and material to the company. By anticipating as early as possible, the losses incurred can be minimized as much as possible. PT X defines an emergency as an event or situation that is not desired to occur suddenly and can develop rapidly to cause life-threatening hazards, asset damage, cessation of operations, and environmental pollution. PT X identifies emergencies in every area and facility in PT X. The identified emergencies that may occur at PT X are fire, explosion, flood, earthquake, tsunami, spill riot, and hazardous and toxic materials (B3).

The source of fire hazard is one of the hazards that can occur at any time at PT X. This is because the production process at PT X uses materials and equipment that can cause fire hazards, such as paint, chemicals used to accelerate the drying of concrete, and the steam process. Based on the potential for emergencies, in anticipating the occurrence of fire emergencies in the company as well as securing company assets, including staff, workers, goods, and other essential documents that must be saved, PT X has created an emergency response system to anticipate emergencies by creating emergency response procedures, forming an Emergency Response Team (ERT), providing emergency equipment and facilities, and conducting training or simulations.

### 3.2. Fire prevention and suppression efforts based on ISRS (International Safety Rating System)

#### 3.2.1. Administration

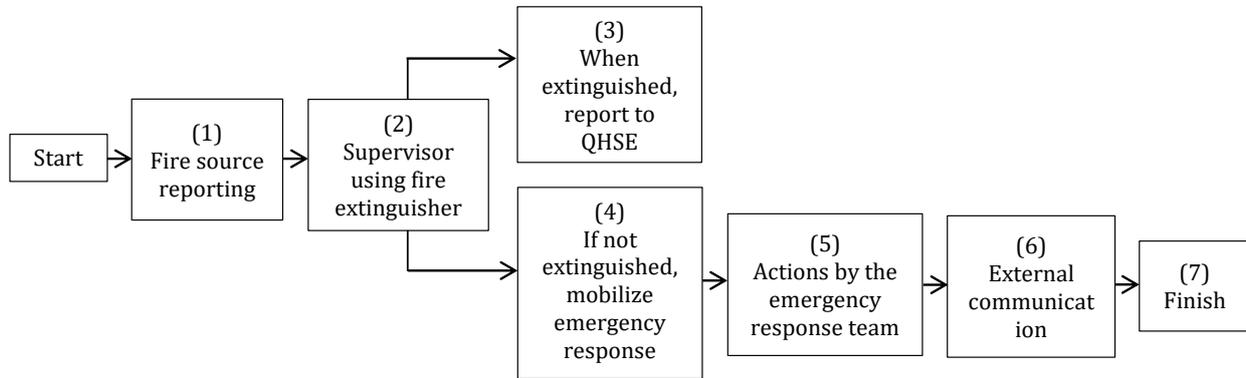
In the emergency prevention and response procedure, PT X has formed an organizational structure consisting of several sections with their respective duties and responsibilities. The parts contained in the organizational structure are the emergency response chairman, emergency response coordinator, HIRA coordinator, fire team, first aid team, communication and security team, and evacuation team. This is done so that emergency handling can be done in an organized manner. This structure involves top management, supervisors, security, and workers. This is based on the points in the ISRS, namely the existence of an emergency management coordinator and the involvement of supervisors to assist the coordinator's duties.

#### 3.2.2. Emergency response analysis

PT X identifies emergencies for each area and facility in the company. This is by ISRS regarding emergency response analysis. Emergencies that may occur at PT X are fire, explosion, flood, earthquake, tsunami, spill riot, hazardous and toxic materials (B3). Based on the potential for emergencies, in anticipating emergencies in the company and securing company assets, including staff, workers, goods, and other essential documents that must be saved, PT X has created an emergency response system to anticipate emergencies by creating emergency response procedures.

### 3.2.3. Emergency Plan

PT X already has procedures for emergency response, evacuation process, and reporting in the event of an emergency. This is based on the points in the ISRS, which stipulate several vital things, such as reporting systems, telephone number placement, and evacuation systems, that the Company must own. PT X has conducted training or simulations on fire emergency response to employees and workers. The following is the fire management procedure at PT X:



### 3.2.4. Preparation for emergencies outside the company

PT X has not developed a procedure for handling fire emergencies outside the company area. The fire emergency management plan is still focused on the company's internal scope. There is no communication system for reporting and responding to emergencies outside the company. The emergency response plan includes spills from transportation carrying hazardous materials.

### 3.2.5. Monitoring of energy sources

At this point, ISRS stipulates several vital points, such as coding, labeling, and emergency shutdown programs. PT X has carried out coding and labeling programs on materials used in production, such as oil, paint, and other materials.

### 3.2.6. Protection and rescue system

PT X has provided fire extinguishing facilities to control and overcome fire hazards, including a light fire extinguisher (APAR). PT X has provided APAR at several points throughout the PT X environment. There is 1 type of fire extinguisher used in all work units, namely a powder-type light fire extinguisher. Monitoring the quality of fire extinguishers is carried out regularly every month to ensure that they are in good condition and maintained, ready to use, and constantly refilled after the expiration date or if the fire extinguisher has been used or exhausted. APAR placement has been adjusted in areas that have potential fire hazards. All APARs have the identity of the location number, position, APAR number, capacity, APAR type, filling date, and APAR expiration date; this is intended so that APAR does not change places and is easy to check by officers. Not only that, PT X also provides two large fire extinguishers (APAB), which are located in the tank house area and the production area.

PT X has fire blanked in several areas, such as offices and canteens. This equipment is installed against the wall in a location considered easy to reach during a fire emergency. To protect against fire hazards, PT X also provides equipment such as kits and evacuation stretchers. First aid kits are provided in several areas, such as canteens, clinics, work areas, security posts, etc. Various types of medicines and first aid equipment are available. The first aid kits available at PT X are type A and type B. Not only that, in a fire emergency, stretchers are very helpful in transporting victims to a safer place. PT X has provided an evacuation route map facility to show the direction or route that must be traveled in an emergency. As a large company, PT X still needs hydrants, automatic fire protection, and rescue alarms.

### 3.2.7. Emergency response team

The firefighting team is included in PT X's emergency response team, which consists of employees who have received training in fire emergency management. PT X provides firefighting training to all members of the emergency response team. Trainers deliver basic firefighting training. PT X has also conducted firefighting training internally.

### *3.2.8. Assessment system*

PT X has carried out simulations in dealing with emergencies by the criteria for assessing system elements in the ISRS. PT X in assessing the success rate of training, has conducted a simulation or drill in the event of a fire. In this simulation, PT X involves emergency response team officers. The company conducts a fire emergency drill simulation at least once a year.

### *3.2.9. First aid*

Based on the first aid criteria in the ISRS, PT X already has a clinic located in a strategic area of the production site and offices. First aid kits are already available in several regions of the company. The placement of the first aid kit also makes it very easy to reach workers and employees if needed. First aid kits are checked once a month. The types of medicines stored in the first aid kit are gauze, 5 cm bandage, 10 cm bandage, 1.25 cm bandage, plaster, cotton, mittela, scissors, safety pins, disposable gloves, paired disposable gloves, masks, tweezers, flashlights, eye wash glasses, plastic bags, distilled water, iodine, 70% alcohol, first aid manuals, and notebooks. PT X has conducted first-aid training in handling emergencies, such as victims who are injured at work and so on.

### *3.2.10. Organized outside help*

In the existing element of ISRS, the joint aid information system, PT X cooperates with related parties in handling emergencies that the internal company cannot handle. Related parties outside the company include the fire department, PMI, police station, and the nearest health center. PT X has an emergency contact number and has been installed at several points in the work area to make it easier for workers and employees to find emergencies so that they can immediately report emergencies that occur.

### *3.2.11. Post-event planning*

After every emergency at PT X, the person in charge of emergency response is responsible for making a complete incident report. The report will later be given to the occupational safety and health officer. PT X also regularly conducts inspections and audits related to emergency response by a team of auditors and HSE. These inspections and audits include inspections of emergency response procedures, inspections of emergency equipment such as APAR and APAB conducted by SHE once a month, and inspections of the emergency response team. Every emergency that occurs at PT X will be chronologically documented and stored as an HSE archive. This aims to report fire emergencies that arise.

### *3.2.12. Fire emergency communication*

Workers who see the source of fire report to the supervisor, and the supervisor tries to extinguish the source of fire using APAR. If the fire is extinguished, the supervisor reports it to the QHSE department. If the fire has not been extinguished, the QHSE section mobilizes an emergency response team with emergency response equipment to the location. The emergency response team evacuates employees and workers to a gathering point and then conducts a life count, trying to extinguish the fire; if the fire occurs in the office, the emergency response team evacuates assets. If the fire cannot be controlled, the emergency response team contacts the Fire Department for further fire extinguishing.

### *3.2.13. Communication with the community*

PT X has communicated with external parties about fire or explosion health, safety, and environmental risks. However, joint training activities regarding fire emergency management have yet to occur. This joint training activity is essential to building shared responsibility to prevent health, safety, and environmental issues.

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## **4. Conclusion**

PT X conducts initial planning for fire emergency management; the company has identified the hazards of fire emergencies, which is the first step in emergency management. Based on the hazard identification that has been carried out, PT X makes procedures regarding the emergency response system with the formation of an emergency response team, the flow of the preparedness process, and the company providing facilities and infrastructure for fire emergencies by ISRS. However, PT X, a large company, still needs a hydrant in the fire prevention efforts. Recovery is done after an emergency by reporting, inspection, audit, and documentation. Overall, PT X implements the emergency response system as well as possible based on the International Safety Rating System (ISRS).

## **Compliance with ethical standards**

### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

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