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Risk Analysis by FMEA Method in Hotel

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Abstract

In thiswork a risk analysis was carried out by FMEA methodat a hotel management. The necessary precautions have been taken by protecting the safety of the managment with the FMEA method. During in this period workflow diagram was done. According to this workflow diagram potential failure, effect, cause and precaution was determined. According to this, in hotel managemet; hazardssuch as glare, fire, explosion, fallin a boilerroom, electricshock in a electricalcontrolroom, slip, drop, fire in a pool boiler room, rheumatism, respiratory tract infection in a fitnessroom, drowning in a baths, fire in power distribution unit was determined. Hazards that exist in different units have been determined and risk has been tried to be destroyed or reduced. For this precaution of hazards need to be done; using of materials comply with the regulations and fragile materials convenient stored, storing chemicals in special storage which will cause glare and explosion, use of fasteners in materials to avoid falling and slipping, smoke and flame detector for fire, providing staff health and safety training, maintenance and repair of the devices must be performed at certain periods. After the implementation of these measures, the results were analyzed by this method and the situation evaluation was carried out. As a result of using the FMEA method, it has been observed that risks are reduced in the risk study. As a result, initially the highest risk values were reduced to the acceptable risk value with the necessary improvement recommendations and the implementation of these recommendations.

Key Words: FMEA, Risk analysis, analizi, hotel management.

1. Introduction

The increase in industrialization in the world has increased the importance given to the production industry and occupational health and safety. In this context, legal regulations and standards have been established for occupational health and safety in industry. In 2012, in order to prevent occupational accidents and occupational diseases, independent Occupational Health and safety law and accordingly, much legislation were enacted.

Risk assessment in Occupational Health and safety, regulatory preventive actions, emergency plans, training and sustainability can be taken as a basis. Risk assessment; is a system that determines the hazards in the system and solves the potential effects and consequences of these hazards. Risk management provides a systematic and realistic system for the prevention of accidents.

Each risk must be taken into account at the stage of determining the risk. Risk from danger, how often, which will be affected, what, and how should be determined. According to the risk method to be selected, how and how to rate should be determined. Control measures should be decided by considering the effect of the existing measures In addition, according to the size and importance of those who have the highest risk should be listed and documented. According to the priority level determined and the resources the employer can allocate, the assessment of the risks is decided in accordance with the method given below. (1-5)

1.1 Failure Mode Effects Analysis (FMEA)

FMEA (Failure Mode Effects Analysis) is an approach that reduces error types in enterprises. The main idea of FMEA is to prevent mistakes early. This method evaluates the possible causes of errors from the design stage. It prevents errors and repeat errors with a systematic logic. Usually focuses on the analysis of parts and equipment. There are four types of this method.

1.1.1 System FMEA

By analyzing the system and its subsystems, it determines the potential error types resulting from the lack of the system. The goal is to ensure the quality and reliability of the system.

1.1.2 Design FMEA

Used to determine the types of errors caused by design before starting production. Its goal is to increase design quality, reliability and sustainability.

1.1.3 Process FMEA

Used to analyze the production and assembly process to eliminate any errors that may arise from deficiencies in the production or assembly process.

1.1.4 Service FMEA

Used to analyze problems in the organization to improve customer service. This analysis makes the ranking of the importance between the organization activities. (5-7)

Error Type and Impact Analysis consist of 9 basic steps:

- Determination of objectives and levels of analyzes
- Define the basic rules and criteria for analysis
- Analysis of the system

- Creation and analysis of process diagrams
- Identification of potential error types
- Examination and classification of error types and their effects
- Determination of measures to prevent and control mistakes.
- Examination of the effects of the proposed measures
- Documentation of results (5-7)

2. MATERIAL AND METHOD

In this study, risk analysis surveys were prepared for a hotel. Responsible person questionnaire was given at the related hotel. The survey was evaluated by faculty members. The necessary improvements for the solution of the problems have been proposed and implemented. After the improvement, the hotel's risk values were measured by scoring again.
In FMEA analysis scoring is done according to the formula below:

RÖS = P (possibility) x S (violence) x D (noticeability)

P: The value of the probability of occurrence of each damage mode
S: The value of damage, violence, seriousness
D: Difficulty rating of discovery of damage
RÖS: Number of Risk Priorities.

- RÖS < 40 There is no need to take precautions
- 40 <RÖS < 100 it is useful to take precautions.
- RÖS > 100 must be taken precautions

Analyzes are made according to these criteria. This formula is used to interpret the results obtained. According to this form, the necessary measures are taken starting from the maximum RÖS valueThe table below shows the analysis criteria and the results of the analyzes carried out.

Table 2.1 The scale of noticeability

Noticeability	Degree	Criterion
Almost Certainly	**1**	**ineffective**
Very high	**2**	**the customer won't be disturbed**
High	**3**	**customer can recognize**
Moderate high	**4**	**the customer may not be satisfied**
Moderate	**5**	**uncomfortable using the customer**
Low	**6**	**the customer is not satisfied**
Nominal	**7**	**customer dissatisfaction too much**
Negligible	**8**	**product can not be used but safe**
Low probability	**9**	**probably in danger - compatible with the law**
Nonprobability	**10**	**dangerous effect - incompatible with the law**

Table 2.2 The scale of violence

Effect	Degree	Criterion
no effect	**1**	**ineffective**
very insignificant effect	**2**	**the customer won't be disturbed**
insignificant effect	**3**	**customer can recognize**
small effect	**4**	**the customer may not be satisfied**
moderate effect	**5**	**uncomfortable using the customer**
significant effect	**6**	**the customer is not satisfied**
great effect	**7**	**customer dissatisfaction too much**
enormous effect	**8**	**product can not be used but safe**
Serious effect	**9**	**probably in danger - compatible with the law**
Dangerous effect	**10**	**dangerous effect - incompatible with the law**

Table 2.3 The scale of probability

Probability	Degree	Criterion
Nonprobability	**1**	**error not possible**
Low probability	**2**	**rare error possible**
Negligible	**3**	**very few possible errors**
Nominal	**4**	**few possible errors**
Low	**5**	**sparse error possible**
Moderate	**6**	**medium error possible**
Moderate high	**7**	**a slightly higher number of possible errors**
high	**8**	**a high number of possible errors**
Very high	**9**	**a very high number of possible errors**
Almost Certainly	**10**	**the probability of error is nearly certain**

Table 2.4 Decision and action by risk level

sequence no	**Risk Value**	**Decision**	**Action**
1	**R<40**	**acceptable risk**	**no needto take precautions**
2	**40 ≤ R< 100**	**precise risk**	**it is useful to take precautions**
3	**R ≥ 100**	**important risk**	**must be taken precautions**

Table 2.5 Risk analysis in pool boiler room

Sequence no		1
Features		pool boiler room
Hazards		Electric shock, cable break, short circuit, fire
Risk Rating	Possibility	5
	Violence	5
	Noticeability	5
	Risk Value	125
Decision		important risk
Action		Must be monitored carefully and removed by annual action plan
Precautions		In the pool boiler inside all inclusive press it should be checked, electric cables not always increased with the loss of the functionality, stored, deformated presses should be changed
Corrective and Preventive Control Measures		
Risk Level Determined		R < 40 acceptable risk

Tablo 2.6 Risk analysis in fitness room

Sequence no		11
Features		Fitness room
Hazards		glassware breakage
Risk Rating	Possibility	5
	Violence	6

	Noticeability	4
	Risk Value	120
Decision		important risk
Action		Must be monitored carefully and removed by annual action plan
Precautions		Additional precautions should be taken to prevent the danger arising from the flexing of the glass and the warning signs should be hung.
Corrective and Preventive Control Measures		
Risk Level Determined		R < 40 acceptable risk

Tablo 2.7 Risk analysis in electrical chamber

Sequence no		111
Features		Electrical chamber
Hazards		
Risk Rating	Possibility	5
	Violence	6
	Noticeability	5
	Risk Value	150
Decision		important risk
Action		Must be monitored carefully and removed by annual action plan
Precautions		Electric power on floors the doors of his room must be locked, no one should enter except the authorized personnel. No material should be placed inside the room, including flammable material.
Corrective and Preventive Control Measures		R < 40 acceptable risk

3. RESULT

In this work a risk analysis was carried out by FMEA methodat a hotel management. The necessary precautions have been taken by protecting the safety of the managment with the FMEA method. During in this period workflow diagram was done. According to this workflow diagram potential failure, effect, cause and precaution was determined. According to this, in hotel managemet; hazardssuch as glare, fire, explosion, fallin a boilerroom, electricshock in a electricalcontrolroom, slip, drop, fire in a pool

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