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# ANALYSIS OF HAZARDS AND RISKS IN A FRUIT JUICE PRODUCTION FACILITY WITH THE FINNEY KINNEY METHOD

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## ABSTRACT

According to the Occupational Health and Safety Law No. 6331, which aims to ensure the occupational safety, continuity and sustainability of the employees in the enterprises, employers are obliged to make or have workplace-specific risk assessments. Lack of risk assessment is the reason for stopping work. The employees' work in the fruit juice production facility was observed at the permissible level, and the risk scores were calculated by analyzing the dangers and risks with the Finney Kinney Risk assessment method. The work done by the employees in the enterprise was analyzed by dividing them into sections. The studies carried out in the enterprise were divided into six sections and analyzed, and as a result of the analysis, a total of 38 risks were identified. Of these risks, 22 were evaluated as Possible Risks, ten as Significant Risks, five as Essential Risks and one as Intolerable Risks, and regulatory and preventive actions were suggested for the risks. According to the employer's compliance with the recommendations, the scores of the risks will be re-evaluated later and added to the conclusion part of the risk assessment. While making the risk assessment, Comparing the risk score before and after proposed regulatory and preventive actions is possible. Sometimes lead to negative results. This study and the suggestions obtained will positively contribute to the literature.

**Keywords:** Occupational Health and Safety, Food Industry, Finney Kinney, Analysis

## INTRODUCTION

The aim of the enterprises is to ensure that the food products necessary for people's healthy living and nutrition are delivered to people in solid or liquid form in packaged form by producing. In the production process, employees inside and outside the enterprise are exposed to many hazards and risks. It is necessary to evaluate the hazards and risks exposed and to show a protective approach against work accidents and occupational diseases. Ensuring the protection and sustainability of the enterprise and its employees is possible by providing occupational health and safety services to its employees by the employer. The aim of occupational health and safety services is based on the principle of showing a protective approach towards employees[1,2].

There are basic principles on which Occupational Health and Safety practices are based. In line with these principles, it is aimed to ensure occupational safety in the working environment[3]. These;

- ✓ Protective approaches towards employees,
- ✓ Protective approaches to production,
- ✓ Protective approaches to enterprise,
- ✓ Protective practices that ensure the sustainability of production,
- ✓ Approaches to increase the health and efficiency of the work,
- ✓ Applications that enable employee participation,

There are three basic elements in the implementation and providing continuance of occupational health and safety; state, employer and employee. State; makes and supervises legislation, employer; learns the legislations and applies them to their workplaces, and the employee adopts and obeys all the practices regarding the accepted and trained legislation[4].

In the enterprise, there are some practices that the employer should do in the provision of occupational health and safety services [5,6]. These;

- ✓ Training of employees against the hazards and risks associated with the work carried out[7],
- ✓ Identification of hazards and risks against work accidents and occupational diseases,
- ✓ Conducting risk assessment by establishing a risk assessment team,
- ✓ Preparing an emergency report for emergencies, Establishing emergency teams,
- ✓ Conducting an emergency drill once a year,
- ✓ Applying the developments in technology to the workplace by following the developments in science and technology,
- ✓ Providing basic occupational health and safety training in certain periods,
- ✓ Establishment of the occupational health and safety committee,

- ✓ Environmental measurements and periodic checks to be made in the workplace,
- ✓ Preparation of annual evaluation report, annual training report and annual work report,
- ✓ Determination of the employee representative by election or appointment,
- ✓ Ensuring the vocational qualification training required for certain professions,

The number of work accidents, occupational diseases and permanent incapacity to work in our country seems to be above the European average despite adequate occupational safety practices [8]. According to Ecole Nationale Supérieure Des Arts Decoratifs (ENSAD) data, 83.2% of the total 32705 accident records in the energy sector are caused by humans, 16.3% by natural disasters and 0.5% by conflict [9]. There are elements that contain many sources of danger due to reasons such as the physical structure of each workplace, the working method used, the existing equipment and time management [10].

With the Labor Law No. 4857 and the Occupational Health and Safety Law No. 6331, the employer is obliged to make or have the Risk Assessment, which evaluates the hazards and risks, at the beginning of the practices to be carried out for the safety of the workplace, the health of the employees and the sustainability of the production in the enterprise. With the risk assessment, corrective and preventive actions are put forward and precautions are taken against work accident or occupational disease. Measures taken; activities that reduce the severity of the risk, the level and probability of the hazard. Necessary information about basic OHS training, periodic health examinations, information on personal protective equipment suitable for the job, preparation of emergency scenarios and actions to be taken in case of work accident are presented to the employer with a risk assessment[10,11].

Risk assessment is mandatory in all workplaces. According to the type of danger, it should be revised at the latest every two years in very dangerous places, at the latest every four years in dangerous places, and at least every six years in less dangerous places. Apart from these, in case of work accident and occupational disease, the new production process in the workplace, the use of new manufacturing methods, and the change of address and title of the workplace should be revised [10,12].

While making the risk assessment, various methods are used according to the structure of the sector, the level of hazard and risk, and the frequency of accidents. Risk assessment methods are divided into three groups as qualitative, quantitative and mixed[13]. If hazards and risks are expressed with numerical data, then quantitative methods are used, if they are expressed with verbal expressions

or figures, qualitative methods and if both verbal and numerical data are available, then mixed risk analysis methods are used. There are over a hundred risk analysis methods available. In practice, at most, 5x5 Risk Matrix and Finney Kinney Risk assessment methods are used [14,15].

In the literature, there are academic studies based on examining the repetitive movements of employees. These academic studies are mostly ergonomics-based studies. REBA (Rapid Entire Body Assessment), RULA (Rapid Upper Body Assessment) and NIOSH (Lifting Equation Calculation) methods that determine the risk level by examining the neck, upper arm and torso movements of the employees[16, 17].

Some of the risk analysis methods in the literature are divided into two groups as qualitative and quantitative and classified as follows [18,19],

Qualitative Risk Assessment Analysis;

- ✓ Preliminary Hazard Analysis - PHA,
- ✓ Job Safety Analysis - JSA,
- ✓ What if ?,
- ✓ Risk Assessment Decision Matrix,
- ✓ Failure Mode and Effects Analysis - FMEA,
- ✓ Hazard and Operability Studies - HAZOP,
- ✓ Fault Tree Analysis - FTA,
- ✓ Event Tree Analysis - ETA,
- ✓ Hazard Analysis and Critical Control Points,
- ✓ Preliminary Risk Analysis - PRA,
- ✓ Preliminary Risk Analysis Using Checklists - PRA,
- ✓ Safety Audit

Quantitative Risk Assessment Analysis;

- ✓ Monte Carlo Simulation,
- ✓ Markov Analysis,
- ✓ Bayesian Networks,
- ✓ Decision Tree,

Occupational health and safety experts in our country use the qualitative 5x5 Matrix and Finney-Kinney Risk analysis in determining hazards and risks, calculating the risk score and categorizing the results, and creating regulatory and preventive action plans [19,20].

In this study, the hazards and risks in a fruit juice production company were evaluated by the risk assessment team and the preventive activities were determined by Finney Kinney Risk assessment method. With this study, it creates an awareness in terms of being aware of the same hazards and risks in similar enterprises. At the same time, a new field of application will be added to the literature.

## MATERIAL AND METHOD

This study has been tried to be implemented by focusing on the potential situations and possibilities that may cause work accident or occupational disease that employees in the production may be exposed to with the Finney Kinney Risk Assessment method of a fruit juice production company. In the Finney Kinney method, the calculation is made by taking into account three parameters while making the risk assessment. While verbal expressions are similar in literature and practice, the tables used are the same. Only the figures used vary according to the interpretation of the practitioner.

The scale tables used to calculate the risk score according to the Finney Kinney Risk assessment are available in table 1 [10].

**Table 1.** Fine-Kinney Method severity, frequency, probability scale table

| S: Severity of the Event (Degree of Damage)                       | F: Frequency of the Event (Frequency of Exposure to the Hazard Over Time) | P: Probability (Probability of Hazard Occurrence) |
|---|---|---|
| 40<br>Fatal accident, serious environmental damage                | 6<br>Frequent (once or several times a day)                               | 6<br>high, quite possible                         |
| 15<br>Permanent damage, job loss, creating environmental barrier, | 3<br>Occasionally (once or several times a week)                          | 3<br>Possible                                     |
| 7<br>Significant damage, injury, need for external first aid      | 2<br>Not often (once or several times a month)                            | 1<br>Possible but low                             |
| 3<br>Minor damage, injury, need for internal first aid            | 1<br>Rare (several times a year)  | 0,5<br>Unexpected but possible                    |
| 1<br>Get off cheap, no environmental damage                       | 0,5<br>Very rare (Once a year or less)                                    | 0,2<br>Unexpected                                 |

With the Finney Kinney Risk Assessment, the risk score ( $R=O \times F \times S$ ) is calculated by multiplying the probability, frequency and severity. The score level obtained is evaluated by looking at the Finney Kinney Risk score table. In Table 2, there are data on whether the risk can be accepted and precautions should be taken according to the risk scores[10].

**Table 2.** Finney Kinney Method Risk Degree Scale

| Risk Value = Probability X Severity X Frequency |                 |                        |   |
|---|-----------------|------------------------|---|
| Risk Rating                                     |                 | Risk Assessment Result |   |
| 1   | $R < 20$        | Insignificant Risk     | Necessary Measures Should Be Taken Immediately / Work Should Be Stopped |
| 2   | $20 < R < 70$   | Possible Risk          | Should be Improved in a Short Time                                      |
| 3   | $70 < R < 200$  | Significant Risk       | It should be improved during the year in line with the plan             |
| 4   | $200 < R < 400$ | Fundamental Risk       | Should be Improved in a Short Time                                      |
| 5   | $400 < R$       | Intolerable Risk       | Necessary Measures Should Be Taken Immediately / Work Should Be Stopped |

Differences were observed in the machinery equipment used in the production and supply of fruit juice according to the type and structure of the enterprise. There are changes in the regulatory and preventive activities carried out according to the production departments of the enterprise. The enterprise where Finney Kinney Risk assessment was carried out was divided into six sections and a risk analysis study was conducted. These;

- 1-Risks covering the whole enterprise,
- 2-Risks in the filling and tetrapark section,
- 3-Risks in process, chips and boiler preparation section,
- 4-Risks in fruit processing and clear concentrate section,
- 5-Risks in the milk acceptance section,
- 6-Risks in the workshop, waste and treatment department,

## RESULTS and DISCUSSION

The risks in the enterprise are examined in six sections, respectively (in Supplementary File)

## CONCLUSION

Finney Kinney Risk assessment was conducted in order to evaluate the hazards and risks in a fruit juice production and packaging enterprise and to demonstrate proactive approaches. As a result of the risk assessment, 22 possible risks, 10 significant risks, 5 fundamental risks and 1 intolerable risk were determined, and current measures taken and recommended regulatory actions were determined. Before the risk assessment is carried out, a risk assessment team is established, training is given to the team, and the risk score is calculated by analyzing the existing risks together with the team, and is presented to the employer by suggesting regulatory and preventive actions. During the field surveillance, the risk score in the final analysis is calculated according to the suitability of the measures to reduce the severity of the existing risks, and the document is added to the occupational health and safety file. Although the risk score ranges are the same in the studies in the literature, there are differences in the way of expression of the risk levels[17,21,22].

The risks that employees will be exposed to during work in the food production and packaging sector are slightly lower than in other sectors. The number of unacceptable and intolerable risks is less, the number of possible risks and significant risks is slightly higher. In this respect, compared to very dangerous places such as mines, construction, shipyards, the food packaging sector contains less danger, it is in a dangerous or less dangerous business line.

Şensoy and Kaya (2019) conducted a 5x5 risk analysis study for the biological factors that

employees may be exposed to during the studies carried out during the disposal of hazardous wastes. Risk analysis studies were carried out by Cündübeyoğlu and Kayabaşı (2022), for the studies carried out in the ceramic factory, for the hotel business by Gündüz and Hüner (2021), and for a port business by Bayram and Kaya (2022). Although the level of risk scores obtained as a result of the studies and the definition of risk are not the same, their ranges are close to each other. The important thing is to examine the studies in the enterprises, to evaluate the risks and as a result, to suggest protective approaches to the employees. Numerical values vary according to the hazard-risk perception of the risk assessment team. Failure to carry out a risk assessment in the workplace is the reason for the suspension of the work.

Various risk analysis methods are available in the literature and in practice. The most preferred is the 5x5 Matrix and Finney Kinney analysis. What distinguishes Finney Kinney from the 5x5 Risk Matrix is the frequency factor. The frequency factor is an important factor in terms of including the frequency of that event.

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## SUPPLEMENTARY FILES

Supplementary File 1. Risks covering the whole enterprise,

| Number | Activity                         | Hazard   | Risk   | Current Measure  | Possibility | Severity | Frequency | Risk Score | Risk Class       | Suggestions  |
|--------|----------------------------------|--|--|--|-------------|----------|-----------|------------|------------------|--|
| 1      | Security-Administrative Building | Vehicles do not park in the direction of exit                    | Difficulty evacuating in an emergency        | Vehicles are parked in the exit direction.                           | 0,5         | 15       | 3         | 22,5       | Possible Risk    | Controlling the parking of vehicles facing the exit direction.   |
| 2      | Security Point                   | Be attacked  | Injury, Work Accident, Death                 | Checking whether it is a company vehicle                             | 1           | 40       | 2         | 80         | Significant Risk | Always be repaired for external attacks.   |
| 3      | Diesel Tank Station              | Intervention by non-officers                                     | Flash, Explosion, Fire, Work Accident, Death | There is a no smoking warning sign. There are defined smoking areas. | 1           | 40       | 2         | 80         | Significant Risk | Preventing anyone other than the officer from intervening in the diesel tank area.   |
| 4      | Diesel Tank Station              | Lack of chemical spill response equipment at diesel tank station | Environmental Damage                         | A chemical spill kit has been allocated.                             | 1           | 8        | 7         | 56         | Possible Risk    | Keeping chemical spill response equipment ready for use near the station.  |
| 5      | Floor                            | Slippery floor   | Fall, Injury                                 | It is not left wet or a slippery floor warning sign is used          | 0,5         | 15       | 6         | 45         | Possible Risk    | Employees should be provided with slip-resistant work shoes, and employees should not move fast and running on slippery floors. Warning signs indicating that there is a risk of slipping into the environment in case the floor is washed should be hung. |
| 6      | Stacking Process                 | Switching between stacked materials                              | Work accident, injury, occupational disease, | Stacking areas have been determined.                                 | 1           | 8        | 5         | 40         | Possible Risk    | Stacking areas should be determined and the entrance of other than authorized personnel should be prohibited. Existing drawn pedestrian paths should be used.  |
| 7      | Hygiene                          | Staff cleaning care  | Bacterial growth, dangerous disease          | Hygiene training is provided.  | 6           | 15       | 4         | 360        | Fundamental Risk | The staff have been made aware of cleaning, especially due to their job requirements. Bones, gloves and aprons that prevent contact with food are used during food preparation and service.  |

**Supplementary File 2.** The risks in the filling and tetrapark section,

| Number | Activity            | Hazard   | Risk                              | Current Measure   | Possibility | Severity | Frequency | Risk Score | Risk Class       | Suggestions   |
|--------|---------------------|--|-----------------------------------|---|-------------|----------|-----------|------------|------------------|---|
| 1      | Electric            | Absence of insulated mats                                    | Electric shock, injury, death     | Isolated mats are available   | 1           | 40       | 3         | 120        | Significant Risk | It is necessary to ensure that the insulated mats in front of the electrical panels are used continuously.  |
| 2      | Fire Extinguishers  | Failure to carry out periodic controls of fire extinguishers | Delay in fire response            | Periodic controls of fire extinguishers are carried out.                                  | 2           | 7        | 4         | 56         | Possible Risk    | It is necessary to ensure that fire extinguishers are periodically checked every six months.  |
| 3      | Machines            | Emergency stop buttons not working                           | Work accident, injury, death      | Emergency buttons are in working condition  | 1           | 15       | 5         | 75         | Significant Risk | It must be ensured that all emergency stop buttons are always operational. Operators should be informed to check the machines before using them.  |
| 4      | Machines            | Climbing on the machines                                     | Work accident, serious injury     | It is explained in Basic OHS trainings that you should not be climbed on the machine.     | 2           | 15       | 4         | 120        | Significant Risk | Personnel outside the job description should not be allowed to climb onto the machines. In addition, in cases where it is necessary to climb on the machine, it should be intervened after taking the necessary safety precautions. |
| 5      | Stairs              | Getting up and down fast                                     | Fall from height, injury,         | In basic OHS trainings, employees are given what they need to do while working at height. | 0,5         | 15       | 6         | 45         | Possible Risk    | It is necessary to move slowly when climbing the stairs. The 3-point rule should be applied. Accordingly, while on the ladder, 2 feet, 1 hand or 2 hands and 1 foot should be in contact with the ladder.                           |
| 6      | Chemical Use        | Unlabeled chemicals  | Work accident, poisoning, injury, | No precautions  | 1           | 15       | 6         | 90         | Significant Risk | It should be ensured that all chemicals have labels with the name of the chemical and its hazards, and that chemicals without a label are not used.   |
| 7      | Use of nitrogen gas | Leaving tubes haphazardly without fixing them                | Explosion, fire, injury,          | No precautions  | 0,5         | 40       | 3         | 60         | Possible Risk    | Nitrogen tubes must be kept fixed and protected against impacts.  |

**Supplementary File 3.** Risks in process, chips and boiler preparation section,

| Number | Activity           | Hazard   | Risk                         | Current Measure  | Possibility | Severity | Frequency | Risk Score | Risk Class       | Suggestions   |
|--------|--------------------|--|------------------------------|--|-------------|----------|-----------|------------|------------------|---|
| 1      | Electric           | Insufficient condition of warning signs in electrical panels | Electric shock, injury death | None   | 2           | 40       | 2         | 160        | Significant Risk | Warning signs stating that there is a risk of electric shock and that it is forbidden for anyone other than the attendant to intervene in all electrical panels must be hung.   |
| 2      | Electric           | Opening of electrical cables, deformation                    | Electric shock               | None   | 1           | 40       | 2         | 80         | Significant Risk | Bare condition, deformed etc. cables should never be used. Cables should not be passed through water. The cables should not be affected by the humidity and temperature in the environment.   |
| 3      | Fire Extinguishers | Failure to carry out periodic controls of fire extinguishers | Delay in fire response       | Periodic checks of fire extinguishers are carried out. | 1           | 7        | 3         | 21         | Possible Risk    | Fire extinguishers should be checked periodically every six months.   |
| 4      | Machines           | Emergency stop buttons not working                           | Work accident, injury, death | Emergency buttons are in working condition             | 1           | 7        | 3         | 21         | Possible Risk    | It must be ensured that all emergency stop buttons are always operational. Operators should be informed to check the machines before using them.  |
| 5      | Stairs             | The stairs are not fixed to the floor                        | Fall, injury                 | None   | 0,5         | 15       | 6         | 45         | Possible Risk    | Stairs must be fixed to the ground to prevent them from moving.   |
| 6      | Chemical Use       | Careless working in the presence of chemicals                | Work accident, injury        | None   | 0,5         | 15       | 8         | 45         | Possible Risk    | In the studies carried out in the fields where chemicals are found, the study should be carried out by taking into account the information in the MSDS form of the chemical. For example, fiery work should not be done next to chemicals that can easily ignite. |
| 7      | Bearings           | Bearings not working, workers pushing with body power        | Musculoskeletal disorders,   | None   | 1           | 15       | 3         | 45         | Possible Risk    | It must be ensured that the bearings are always in working condition.   |



**Supplementary File 4.** Risks in fruit processing and clear concentrate section,

| Number | Activity                               | Hazard  | Risk                          | Current Measure                    | Possibility | Severity | Frequency | Risk Score | Risk Class       | Suggestions   |
|--------|--|---|-------------------------------|------------------------------------|-------------|----------|-----------|------------|------------------|---|
| 1      | Fruit Processing and Clear Concentrate | Loading more than the capacity of the hoist           | Work accident, injury         | None                               | 0,5         | 7        | 6         | 21         | Possible Risk    | It should be used within the usage limits of the hoist. Employees should not enter the restricted area. It should not load a load above the capacity of the hoist.  |
| 2      | Electric                               | Absence of insulated mats                             | Electric shock, injury, death | Isolated mats are available        | 2           | 40       | 1         | 80         | Significant Risk | It is necessary to ensure that the insulated mats in front of the electrical panels are used continuously.  |
| 3      | Machines                               | Disabling safety measures                             | Injury, death                 | None                               | 0,5         | 15       | 6         | 45         | Possible Risk    | Safety measures such as safety switches, beam barriers, etc. of all equipment and machines must always be in active operation. Work should not be carried out with equipment that does not work with safety measures. |
| 4      | Machines                               | Absence of grounding of metal body equipment          | Electric shock                | Metal body grounding is available. | 2           | 30       | 4         | 240        | Fundamental Risk | All equipment with metal body must have body grounding. Equipment without grounding should not be used..  |
| 5      | Machines                               | Failure to make necessary checks before starting work | Work accident                 | None                               | 0,5         | 15       | 6         | 45         | Possible Risk    | Before starting to work with the machine, the operators should check the machine environment and start working after making sure that no one is inside.   |

**Supplementary File 5.** Risks in the milk acceptance section,

| Number | Activity            | Hazard  | Risk                                  | Current Measure                               | Possibility | Severity | Frequency | Risk Score | Risk Class       | Suggestions   |
|--------|---------------------|---|---------------------------------------|---|-------------|----------|-----------|------------|------------------|---|
| 1      | Chemical Use        | Chemicals are unlabeled                                 | Work accident, poisoning              | None  | 0,5         | 15       | 4         | 30         | Possible Risk    | Personnel outside the job description should be prevented from getting on the machines. In addition, in cases where it is necessary to climb on the machine, it should be intervened after taking the necessary safety precautions. |
| 2      | Tanks               | Inappropriateness of the exit ladder on top of the tank | Falling from high                     | None  | 1           | 15       | 3         | 45         | Possible Risk    | There must be a ladder that is obstructed to the exit of unauthorized personnel, where the ladder on the top of the tank has a fixed protection. Stair steps must be non-slip.  |
| 3      | Eye and Body Shower | Eye and body shower not working                         | Increasing severity of injury         | Body and eye shower are in working condition. | 2           | 20       | 2         | 80         | Significant Risk | It must be ensured that the eye and body shower is always in working condition.   |
| 4      | Vehicle Loading     | No wedges in front of vehicle wheels                    | Work accident                         | Wedges are available.                         | 1           | 7        | 6         | 42         | Possible Risk    | In order to prevent the vehicles from moving uncontrollably, wedges should be placed in front of the vehicle wheels.  |
| 5      | Emergency           | Inappropriateness of emergency lighting                 | Difficulty evacuating in an emergency | None  | 3           | 100      | 2         | 600        | Intolerable Risk | Emergency lighting should provide sufficient lighting in case of a possible emergency and should illuminate for at least 120 minutes. These lightings need to be fed from a separate electricity source.                            |

**Supplementary File 6.** Risks in the workshop, waste and treatment department,

| Number | Activity         | Hazard  | Risk                                   | Current Measure | Possibility | Severity | Frequency | Risk Score | Risk Class       | Suggestions  |
|--------|------------------|---|--|-----------------|-------------|----------|-----------|------------|------------------|--|
| 1      | Spiral           | Leaving the unused spiral plugged into the socket,  | Work accident, injury                  | None            | 2           | 8        | 6         | 96         | Fundamental Risk | Ensuring that unused hand tools are not left plugged into the socket,  |
| 2      | Grinding machine | Burr splashes in the eyes of unauthorized personnel approaching the work area while working on the grinding machine | Work accident, injury                  | None            | 1           | 7        | 6         | 42         | Possible Risk    | While working on the grinding machine, other unauthorized personnel without glasses should be prevented from approaching the work area.  |
| 3      | Grinding         | Grinding work   | Work accident, injury, fire, explosion | None            | 0,5         | 40       | 3         | 60         | Possible Risk    | <p>Flammable, explosive materials and dust should be removed or protected near the place where the grinding work is performed.</p> <p>* If the grinding work is done in a closed environment, explosive and flammable materials in the environment should be removed and there should be no cracks or gaps on the walls or floor of the room where gas can enter.</p> <p>* Appropriate type and size of fire extinguisher should be available while grinding work.</p> <p>* No personnel other than properly trained personnel should perform the grinding work.</p> <p>* While the grinding work is being done, if necessary, a watcher should be kept in case of fire or explosion, and emergency exits should be kept appropriate and open.</p> |

|   |  |  |  |   |     |    |   |     |                  |   |
|---|--|--|--|---|-----|----|---|-----|------------------|---|
| 4 | Oxygen cylinders                             | The presence of a holding valve in the hose of oxygen cylinders                    | Work accident, injury, fire, explosion                     | There is one holding valve                  | 2   | 40 | 2 | 160 | Fundamental Risk | Attaching one more safety valve to the oxygen cylinder hoses  |
| 5 | Use of Personal Protective Equipment         | Personal materials suitable for the work of employees wearing protective equipment | Work accident, occupational disease                        | None  | 0,5 | 15 | 6 | 45  | Possible Risk    | Employees should be ensured to use personal protective equipment such as masks, goggles, work shoes, gloves, headphones, etc. in accordance with their work.                                    |
| 6 | Welding Works                                | Operation of electrode welding current generators without grounding                | Electric shock, Work accident, occupational disease, death | Grounding is done.                          | 0,5 | 40 | 3 | 60  | Possible Risk    | Grounding must be done.   |
| 7 | Waste Water Treatment and Waste Storage Area | Personnel not using personal protective equipment                                  | Injury, Work Accident, Illness                             | Personal protective equipment is available. | 1   | 15 | 6 | 90  | Fundamental Risk | Work shoes/boots, work gloves, overalls, safety glasses, ear protectors, dust masks, etc., for the personnel to use in the working area. active use of necessary personal protective equipment. |