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Assessment of the Workplace Conditions and Health and Safety Situation in Chemical and Textile Industries of Pakistan

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Abstract: The study was conducted to assess the workplace conditions, health and safety situations in textile and chemical industries of one of the commercial cities of Pakistan i.e. Faisalabad. Risk assessment was conducted through qualitative and quantitative assessment methods. The effluents and gases emissions in the textile and chemical mills of Faisalabad were monitored. Results indicated the working conditions in the work place were not conducive for maximum productivity and there was high risk that may be befalling to the workers from multiple hazards exacerbated by inadequate physical conditions. Over all the temperature, humidity, noise and light levels were either below or above the defined NEQS (National Environmental Quality Standards) at multiple places in each industry. Workers are uninformed of the health and safety protocols at workplace and there is a dire need to give trainings and awareness regarding health and safety issues.

Keywords: Health and Safety, Chemical Industry, Textile Industry, NEQS, Workplace Physical Conditions

1. Introduction

The reduction of hazards improves the safety and quality of life for human and for the environment (Awan, T., 2001). Therefore performance of risk assessment of hazards is an important process to organize the management of these hazards (Mohamed, 2008). Risk assessment is an analytic technique that is used in different situations, depending upon the characteristic of the hazard, the existing data, and requirements of decision makers (Hood, J. and Allison, J., 2001). The objective of hazards and risk analysis is to identify and analyze hazards, the event sequences leading to hazards and the risk of hazardous events (Beck, U., 1992). Many techniques ranging from simple qualitative methods to advanced quantitative methods are available to help identify and analyze hazards (Chrostek, A., 2005). The use of multiple hazard analysis techniques is recommended because each has its own purpose, strengths, and weaknesses (Pitt, M. J., 1994). For any industry to be successful, it should meet not only the production requirements, but also maintain the highest safety standards for all concerned (Demis, P., 1997). The industry has to identify the hazards, assess the associated risks and bring the risks to tolerable level on a continuous basis. Industries having a hazardous operation have considerable safety risks for workers (Paithankar, 2011). Unsafe conditions and practices in an industrial working area lead to a number of accidents and causes loss and injury to human lives, damages the property, interrupt production etc (Fantahum, M., and Abebe, Y., 1999). The hazards cannot be completely eliminated, and thus there is a need to define and estimate an accident risk level possible to be presented either in quantitative or qualitative way (Qureshi, A. R., 1988).

Successful occupational health and safety practice require

the collaboration and participation of both employers and workers in health and safety program, and involves the consideration of issues relating to occupational medicine, industrial hygiene, toxicology, education, engineering safety, ergonomics, and psychology (Frank, T., et. al., 2008). Occupational health and safety is the issue of complete physical, mental and social well-being within a workplace (Ahasan et al., 2000). Risk assessments help the operators to identify high, medium and low risk levels. Risk assessments help to priorities risks and provide information on the probability of harm arising and severity of harm by understanding the hazard, combine assessments of probability and severity to produce an assessment of risk and it is used in the decision making. In this way, plant owners and operators could be able to implement safety improvements. To make sure safety in plants, various tools and appropriate steps have to be taken to make any workplace better and safer (Cockshott, J. E., 2005).

In chemical and textile industries different types of chemicals in gaseous, liquid and solid form are used during process and production. These chemicals characterized as: toxic, corrosive, explosive, flammable, radioactive, reactive, and carcinogenic have their health effects on human resulting from acute or chronic exposure (Mohamed, 2008).

Chemical industries have more critical environment than textile sectors. The most commonly occurring hazards in chemical plant include Fire hazards, Electrical hazards, Falling hazards, Slipping hazards (Jelmenesky, et. al., 2003; Needham, et. al. 2005). While, the most commonly occurring hazards in textile industries include: Fire hazards, Chemical Spillage/ Splashing hazards, Gas leakages/ Emissions Hazards, Cotton wool dust emissions, Chemical exposure, Effluents emissions (Posted, 2000). In most of the industrial activities, especially in factories or mills (textile, chemical, sugar, and others), the concept of Health, Safety, and Environment is ignored. This research aims at identifying and assessing workplace hazards (physically, chemically and biologically) and control of these hazards through different appropriate techniques. There are four industries which had been covered in this study:

I. Sitara Chemical Industries Pvt Ltd Faisalabad.
II. Aslam Chemical Industry Pvt Ltd, Faisalabad.
III. Masood Textiles Mills Pvt Ltd Faisalabad.
IV. Interloop Textile industry Pvt Ltd Faisalabad.

This research was conducted in chemical and textile industries in Faisalabad to study the risk of hazardous chemicals, gaseous emissions and other workplace hazards. However, the primary objectives of the study are:

1. To identify health, safety hazards (Falling, Slipping, Tripping, Electrical hazards and Fire hazards) occurring in chemical and textile industries.
2. To identify the environmental hazards (Gases emissions, Chemical leakages/ spillages/ splashing and effluents emissions) occurring in chemical and textile industries.
3. Risk assessment and evaluation of workplace hazards (Health, Safety and Environment Hazards) occurring in the plant area.

2. Material and Methods

Meetings were held with the safety engineers and persons and issues like workers health, fire hazards, other hazards related to workers are consulted. Interviews of the workers and the staff were taken by the use of questionnaires and checklist.

Risk assessment was designed to assess and analyze the occupational hazards the work site to investigate hazards (Health Safety Hazards) in all units of textile mills and chemical industries. Also the environmental hazards (Relative Humidity and Temperature, noise level, Illumination level, effluent status, and air pollution problems) were assessed. A questionnaire and observational check lists was used to evaluate occupational health and safety issues.

Following steps were used for the risk assessment:

Step1: Hazard Identification

Hazards were identified for each job through taking the flow sheet diagram at every work place.

Step 2: Risk Assessment

The risk probability to workers that may be exposed to any injury or mishap was determined.

Step 3: Risk controls

All practicable measures for eliminating or reducing the likelihood of an injury, illness or diseases in the workplace were identified, developed, implemented and continually reviewed.

Step 4: Implementation of risk controls

All hazards that have been assessed should be dealt in order of priority.

Step 5: Monitor and Review

The effectiveness of hazard assessment and control measures were regularly reviewed (Paithankar, 2011).

2.1. Identification of the Hazards

To identify all types of hazards include chemical, fire, dust emission, slips, trips and falls, these steps were followed:

1. Consultation with employees.
2. Premises inspection.
3. Interviewing the employees
4. Review of the accidental history in the industry

2.2. Instruments Used

The instruments which were used for workplace and Environmental hazard identification and effluents and gases emissions testing are as follow:

1. Dragger testing tubes for measuring the gaseous emissions.
2. Digital Meter for gaseous emissions testing in air.
3. Flue gas Analyzer
4. Noise meter to monitor the noise level.
5. Thermometer to measure the ambient temperature.
6. pH meter to monitor the effluents condition.

7. TDS Meter Hanna Model HI- 98311 to measure the TDS level.
8. O2 Meter
9. LUX Meter (Light Intensity Meter)
10. Relative Humidity Meter
11. Wind socks/ arrows to measure the wind directions against gaseous emissions.
12. Fire Alarm, fire extinguishers

2.3. Checklist ELMERI Index

ELMERI index was used for hazard evaluation. ELMERI is a reliable safety and health monitoring tool for manufacturing industry and is simple and quick to use in any plant of any size in any industrial sector (Laitinen et.al, 2011).

$$\text{ELMERI Index} = \frac{\text{Correct}}{\text{Correct} + \text{not correct}} \times 100 = \%$$

2.4. Analysis of Safe Man Hours

This statistical analysis method is also used for analyzed and evaluate the implementation level of safety policy in an industry. This analysis shows the incidents/ injuries detail and total safe man hours (NIOSH Forum, Total Safe Man Hours) as shown in figure 1.

Total Safe Man Hours

= Last Injury date * total No of Employees

3. Results and Discussion

3.1. Annual Graphical Representation of Incidents/Injuries of Different Industries at Sheikhupura Road, Faisalabad

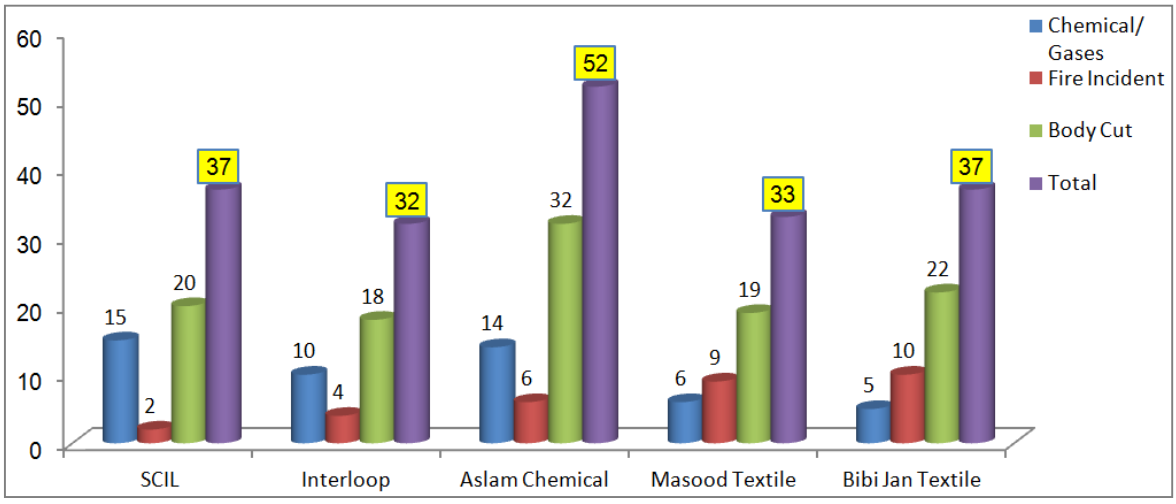

Figure 1. *Annual Incidents/ Accidents Record of Industries.*

The total incidents happened in Sitara Chemical, Aslam Chemical, Masood Textile Industries and Interloop Textile Industries at Sheikhupura road Faisalabad are 37, 32, 52, and 33 respectively. The total incidents/ accidents happened in Aslam Chemical Industries were more than the any other industry having value 52 in the year 2012 (see figure 1).

3.2. Statistical Analyses

The data collected through this study is analyzed to evaluate the potential level of risk at the workplace. Such as we can calculate Total Safe Man Hours through this collected injury data as:

Total Safe Man Hours

= Last Injury date * total No of Employees

1. Sitara Chemical Industries Ltd

Last injury in SCIL from July to December 2012 was December 26, 2012 at 11:00 hrs in morning shift.

Total No. of Employees in SCIL = 2000 employees

Total Safe Man Hours = 139 * 2000 = 278000 hours

2. Aslam Chemical Industries

Last injury in ACI was December 29, 2013 at 14:00 hrs in evening shift.

Total no of employees = 200

Total Safe man Hours = 64* 200 = 12800

3. Masood Textile Industries Ltd

Last injury date in Masood Textile Industries Ltd was December 28, 2013 at 15:00 hrs in evening shift.

Total No of employees = 5000

Total safe man hours = 87 * 5000 = 435000

4. Interloop Textile Industries Ltd

Last injury date was December 25, 2013 at 16:00 hrs in evening shift.

Total no of employees = 4000

Total Safe man Hours = 158 * 4000 = 632000

These safe man hours shows the implementation level of company safety policy and implementation level of safety control measures against workplace hazards.

3.3. Result of Relative Humidity and Temperature

The normal range of relative humidity is 40-60 % (Stalker, *K.,* 2003). The relative humidity in chemical and Textile industries in different sections is within the limits of NEQS and OSHA standards limits. But in some sections including spinning halls and pressing units in textile industries had low relative humidity.

Table 1. *Relative Humidity.*

Place	Results %	Standard %	Remarks
Interloop			
Spinning Hall	30	40- 60	Low
Boiler	40	40- 60	Adequate
Dyeing Hall	55	40- 60	Good
Pressing hall	55	40- 60	Good
Finished Product Hall	45	40- 60	Adequate
Laboratory	50	40- 60	Adequate
Masood Textile			
Spinning Hall	28	40- 60	Low
Boiler	35	40- 60	Low
Dyeing Hall	40	40- 60	Adequate
Pressing hall	45	40- 60	Adequate
Finished Product Hall	43	40- 60	Adequate
Laboratory	47	40- 60	Adequate
Aslam Chemical			
Boiler	25	40- 60	Low
Filling Area	35	40- 60	Low
Packing Area	40	40- 60	Adequate
Laboratory	45	40- 60	Adequate
Sitara Chemical			
HCL Area	35	40- 60	Low
Caustic plant Area	38	40- 60	Low
Power Plant	54	40- 60	Good
Boiler	43	40- 60	Adequate
Filling Station	49	40- 60	Adequate
Gases Area	50	40- 60	Adequate
Laboratory	59	40- 60	Very Good

3.4. Results of Temperature

OSHA recommends temperature range of 25°C. The findings of monitored parameter are given below. Observations in both the Textile and Chemical industries exceeded the normal workplace temperature limits. Boilers locations were found to be warmest in the workplace.

Table 2. *Results of Temperature.*

Place	Temperature (°C)	Standard	Remarks
Interloop			
Spinning hall	45	25	Exceeds than NEQS
Boiler	49	25	Exceeds than NEQS
Dying hall	45	25	Exceeds than NEQS
Pressing hall	45	25	Exceeds than NEQS
Finished Product hall	40	25	Exceeds than NEQS
Masood Textile			
Spinning hall	48	25	Exceeds than NEQS
Boiler	50	25	Exceeds than NEQS
Dying hall	44	25	Exceeds than NEQS
Pressing hall	43	25	Exceeds than NEQS
Finished Product hall	37	25	Exceeds than NEQS
Aslam Textile			
Spinning Hall	43	25	Exceeds than NEQS
Boiler	52	25	Exceeds than NEQS
Dying hall	42	25	Exceeds than NEQS
Pressing hall	43	25	Exceeds than NEQS
Finished Product hall	40	25	Exceeds than NEQS
Sitara Chemical			
HCL Area	42	25	Exceeds than NEQS
Caustic plant Area	45	25	Exceeds than NEQS
Power Plant	46	25	Exceeds than NEQS
Boiler	48	25	Exceeds than NEQS
Filling Station	40	25	Exceeds than NEQS
Power Plant	45	25	Exceeds than NEQS

3.5. Result of Noise Level

The proposed national environmental quality standard for noise in industrial area is 75 dB (A) for 8 hours working period at day time in a workplace.

Table 3. *Results of Noise Level.*

Place	Noise Level (db)	NEQS (db) for industrial zone	Remarks
Interloop			
Laboratory	65	75	Well Within NEQS
Compressor room	85	75	Exceeds than NEQS
Generator room	87	75	Exceeds than NEQS
Pressing hall	45	75	Well Within NEQS
Finished Product hall	40	75	Well Within NEQS
Boiler	80	75	Well Within NEQS
Masood Textile			
Laboratory	74	75	Exceeds than NEQS
Compressor room	76	75	Exceeds than NEQS
Generator room	82	75	Exceeds than NEQS
Pressing hall	65	75	Well Within NEQS
Finished Product hall	45	75	Well Within NEQS
Boiler	77	75	Exceeds than NEQS
Aslam Chemical			
Laboratory	70	75	Exceeds than NEQS
Compressor room	77	75	Exceeds than NEQS
Generator room	86	75	Exceeds than NEQS
Pressing hall	69	75	Well within NEQS
Finished product hall	58	75	Well Within NEQS
Sitara Chemical			
Laboratory	75	75	Well within NEQS
Compressor room	79	75	Exceeds than NEQS
Generator room	88	75	Exceeds than NEQS
Coal Boiler	70	75	Well Within NEQS
Power plant	107	75	Exceeds than NEQS

In Interloop, noise level of different sections including laboratory, compressor room, generator room, pressing hall, finished products hall, and boiler area are 65, 85, 87, 45, 40 and 80 dBA respectively. In these findings compressor room, generator and boiler area noise level are high than standards limits.

In Masood Textile Mill, noise level of different sections including laboratory, compressor room, generator room, pressing hall, and finished products hall, and boiler area are 74, 76, 82, 65, 45, and 77 dBA respectively. In these findings compressor room, generator and boiler area noise level are high than standards limits.

In Aslam Chemical Industry, noise level of different sections including laboratory, compressor room, generator room, pressing hall, and finished products hall, areas are 70, 77, 86, 69, and 58 dBA respectively. In these findings compressor room and generator area noise level are high than standards limits.

In Sitara Chemical Industry, noise level of different sections including laboratory, compressor room, generator room, coal boiler and power plant areas are 75, 79, 88, 70, and 107 dBA respectively. In these findings compressor room, generator room and power plant area noise level are high than standards limits.

Table 4. *Results of Illumination Level.*

Place	Observed Readings	Standard (LUX)	Remarks
Interloop			
Spinning hall	170	250	Poor
Boiler	280	250	Good
Generator	300	250	Very Good
Dyeing hall	160	250	Poor
Pressing hall	180	250	Poor
Finished Product Hall	120	250	Poor
Laboratory	160	250	Poor
Masood Textile			
Spinning Hall	165	250	Poor
Boiler	260	250	Adequate
Generator room	289	250	Good
Dyeing Hall	165	250	Poor
Pressing hall	170	250	Poor
Finished Product Hall	110	250	Poor
Laboratory	140	250	Poor
Aslam Chemical			
Boiler	190	250	Poor
Generator Room	170	250	Poor
Filling Area	160	250	Very Poor
Packing Area	80	250	Very Poor
Laboratory	120	250	Very Poor
Sitara Chemical			
HCL Area	170	250	Very Poor
Caustic plant Area	230	250	Poor
Power Plant	260	250	Adequate
Boiler	290	250	Good
Generator Room	300	250	Very Good
Filling Station	140	250	Very Poor
Gases Area	255	250	Adequate
SSP	160	250	Very Poor
Laboratory	245	250	Adequate

3.6. Result of Illumination Level

According to OSHA, standard level of light is 250 LUX and according to NEQS is 300 LUX. the monitored results of illumination level at various locations were not according to the standard in both textile and chemical industries except generators and boilers sections. The illumination level at Aslam Chemical Industry is less than 190 in all sections and machines, which is more poor level of light at work place than the other industries. Similarly at Interloop Textile and Masood Textile illumination was poorer at most places.

3.7. Results of Effluents Emissions

Waste water samples were collected from the treatment plants as well as internal drainage pipelines and pH, BOD, COD, TSS, and TDS were measured. The findings of wastewater of four industries are given below. All the industries violated the NEQS for the above parameters except for the pH in Sitara Chemicals which was 9.1 slightly higher than NEQS (i.e. 6 ~9).

Table 5. *Test Report of Wastewater of four Textile and Chemical Industries.*

Industry	Parameter (mg/L)	Standards Limit (mg/L)	Results	Remarks
Sitara Chemical	pH	6 ~9	9.1	Within NEQS Limits
	TDS	3500	5000	High
	TSS	200	250	High
	BOD	80	90	High
	COD	150	140	Within NEQS
Aslam Chemical	pH	6 ~9	2.5	Low than NEQS Limits
	TDS	3500	10,000	High
	TSS	200	310	High
	BOD	80	150	High
	COD	150	250	High
Interloop	pH	6 ~9	10.9	High than NEQS Limits
	TDS	3500	9000	High
	TSS	200	210	High
	BOD	80	120	High
	COD	150	300	High
Masood Textile	pH	6 ~9	12.2	Very High than NEQS Limits
	TDS	3500	6600	High
	TSS	200	240	High
	BOD	80	110	High
	COD	150	225	High

3.8. Results of Gases Emissions

Emission samples were collected from the stacks chimneys as well as ambient air emissions in the workplace. The findings of tested parameters which included Chlorine, SO_x, NO_x, HCL, CO, PM, HF are given below.

Table 6a. *Results of Gases Emissions of Sitara Chemical Industries LTD.*

Sr. No.	Gas Type	NEQS ug/m^3	Results ug/m^3	Remarks
1	Cl_2	150	50	Well within NEQS Limits
2	Suspended PM	500 ug/m^3 = 0.5 ug/m^3 at 24 hours basis	0.82	Exceeds than NEQS Limits
3	SO_2	120 ug/m^3 = 0.12 ug/m^3 at 24 hourly basis	0.11	Well within NEQS Limits
4	NO_2	80 ug/m^3 = 0.08 ug/m^3	0.09	Exceeds than NEQS Limits
5	HCL	400	240.4	Well within NEQS Limits
6	CO	5 ug/m^3 at 8 hours basis	7.8	Exceeds than NEQS Limits
7	HF	150 (OSHA = 2.5)	20.5	Well within NEQS Limits

Table 6b. *Results of Gases Emissions of Interloop Textile Industries LTD.*

Sr. No.	Gas Type	NEQS mg/m^3	Results mg/m^3	Remarks
1	Cl_2	150	25.4	Well Within NEQS Limits
2	SO_2	0.12	0.9	Well Within NEQS Limits
3	NO_2	0.08	0.1	Exceeds than NEQS Limits
4	PM	0.5	0.65	Exceeds than NEQS Limits
5	CO	5	4.45	Well Within NEQS Limits
6	NH_3	400	350	Well Within NEQS Limits

Table 6c. *Results of Gases Emissions of Aslam Chemical Industries LTD.*

Sr. No.	Gas Type	NEQS mg/m^3	Results mg/m^3	Remarks
1	SO_2	0.12	2.1	Exceeds than NEQS Limits
2	NO_2	0.08	0.15	Exceeds than NEQS Limits
3	PM	0.5	0.45	Well within the NEQS Limits
4	CO	5	4.12	Well within the NEQS Limits
5	HCL	400	567.6	Exceeds than NEQS Limits

Table 6d. *Results of Gases Emissions of Masood Textile Industries LTD.*

Sr. No.	Gas Type	NEQS mg/m^3	Results mg/m^3	Remarks
1	SO_2	0.12	0.14	Exceeds than NEQS Limits
2	NO_2	0.08	0.66	Well within the NEQS Limits
3	PM	0.5	5.3	Exceeds than NEQS Limits
4	CO	5	4.4	Well within the NEQS Limits
5	NH_3	400	250	Well within the NEQS Limits

Among the investigated parameters, Cl_2, SO_2, HF and HCL parameters of Sitara and PM of Aslam Chemical Industries are only within the NEQS limits. Others parameters were beyond the standard limits. Interloop have only CL_2, SO_2, CO, and NH_3 and Masood Textile Industries have only NO_2, CO and NH_3 parameter within the NEQS limits. Remaining all the findings parameters results values were above the standard limits.

Gases emissions of Sitara Chemical measured are Cl_2, PM, SO_2, NO_2, HCL, CO and HF etc. The standards limits are 150, 0.5, 0.12, 0.08, 400, 5 and 150 mg/m^3, but findings are 50, 0.82, 0.11.5, 0.09, 240.4, 7.8 and 20.5 mg/m3 respectively. In these finding parameters Cl_2, HF, SO_2, and HCL gases were within the NEQS limits. Meanwhile HF result is within the NEQS limits but exceeded OSHA standard limits that is 2.5 mg/m^3 limit.

Gases emissions of Interloop textile Industry were measured Cl_2, SO_2, NO_2, SPM, CO and NH_3 etc. The NEQS limits are 150, 0.12, 0.08, 0.5, 5 and 400 mg/m^3, but observed values were 25.4, 0.9, 0.1, 0.6, 4.45 and 350 respectively. In these results only CO was within the NEQS limits.

Gas emissions of Aslam Chemical Industry measured were SO_2, NO_2, PM, CO and HCL etc. The NEQS limits are 0.12 mg/m^3, 0.08 mg/m^3, 0.5 mg/m^3, 5 mg/m^3 and 400 mg/m^3, but the observed values were 2.1, 0.15, 0.45, 4.12 and 567 mg/m^3 respectively. In these findings Carbon mono oxide was only within the standard limit. All others findings values are beyond the NEQS limits.

Gases emissions of Masood Textile Industry measured SO2, NO_2, PM, CO and NH3 were measured in Masood Textile. The NEQS limits are 0.12 mg/m^3, 0.08 mg/m^3, 0.5 mg/m^3, 5 mg/m^3, and 400 mg/m^3 respectively, but the observed values were 0.14, 0.66, 5.3, 4.4 and 250 mg/m^3. In these findings some of the parameters are within the NEQS limit and most of the remaining all others investigated parameters findings values are high than the standards limits.

3.9. ELMERI Observations

Table 7a. *ELMERI Observation.*

ELMERI Observation	Remarks
0-20%	Very Poor
21-40	Poor
41-60	Moderate
61-80	Good
81-90	Very Good
91-100	Excellent

Table 7b. *ELMERI Observation in different Industries.*

Sr. No.	Departments	Total Correct Observation	Total Non Correct Observation	ELMERI Index (%)
1	Interloop	65	40	61
2	Aslam Chemical Industry	20	50	28
3	Sitara Chemical	60	49	55
4	Masood Textile Industry	35	55	38

3.10. Others Workplace Safety Issues

During walk through surveys in the industries following issues were observed:

1. None usage of Personal Protective Equipment by workers
2. Workers unaware of health and safety protocols in the workplace
3. Lack of interest on behalf of the Employer

4. Poor handling of hazardous chemicals
5. Poor machinery management
6. Poor internal drainage system
7. Absence of safety signs and hazard indicators in the workplace

3.11. Potential Hazards in the Industries

During walkthrough surveys in both Textile and Chemical industries following potential hazards were identified

- Fire
- Explosions
- Toxic release
- Short Circuiting
- Chemical/ gas leakage or reaction

4. Conclusion

It is concluded from the interviews, experimental work and walkthrough survey in the working environment that the workers are facing the following problems in the studied textile and chemical industries in Faisalabad.

- Physically, environment is a bit harsh. It is very humid. It may lead to headaches and breathing problems if exposure is long enough.
- The workers are facing high noise levels in some zones of the textile industries (generators, bleaching machines, dyeing machines, drying machines, hydro machines and knitting machines) and area of chemical industries (generators, evaporation units, power plants, cooling towers pumps/ fans, rectifiers) etc. The noise is also affecting inside office as well as some other enclosed areas.
- Internal Drainage system inside and outside the buildings is very poor in most of the textile units at small scale.
- Heat stress is present in pressing, electricity generating facilities plants, generators, boilers, filling stations, drying, bleaching and dyeing units. Humidity is present as well which leads to breathing problems.
- Chemical are handled without the use of any personal protective equipment that is a source of potential hazard.
- Housekeeping in the Dyeing, Bleaching and chemical handling section is very poor in both textile and chemical industries.
- Housekeeping in the chemical industries is also very poor especially in (Filling stations, mechanical workshops, and processing units).
- In textile sectors, waste water effluents are serious issues as they pollutes ground water.
- In chemical industries, there is high risk of safety hazards as compared to Textile sectors and workers are more affected and injured. On daily basis incidents/ accidents are occurring in these industries.
- Fire safety hazard is most common and major hazard in textile industries resulting from poor handling and storage of the raw material and chemicals.
- Workers don't know the concept of Health, Safety and Environment which is a main issue and this leads to accidents.

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