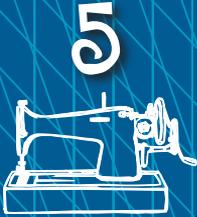


Unit



Hazards in Industry and Safety Measures



17915CH05

INTRODUCTION

There are different type of machinery that a Sewing Machine Operator uses in the garment industry. Thus, it is very important to have an understanding about the safety and health measures while operating them. Although it is essential that the management take important steps to protect and safeguard the operators from potential hazardous situations, but the best way for any Sewing Machine Operator to be safe and healthy is to be aware of the various occupational hazards associated with sewing machine operation, and work-related illnesses and injuries. Many of the injuries are caused mainly by the Operator's error, carelessness and inattentiveness.

The Operators must be properly guided for the use of all the tools and equipment, machines, their safety measures, and precautions to be taken at the time of working. It should be compulsory for the Operator to follow the basic instruction to use machines, tools and equipment. Suitable furniture, proper ventilation and lighting and efficient safety measures for emergency situations are necessary for the safety and health of the Operators. First-aid kits, safety symbols/signs, fire extinguishers, and alarms are the most important safety measures in the manufacturing units.

SESSION 1: RISK AND HAZARDS IN INDUSTRY

NOTES

Risk is a random incident that may possibly occur, and if it occurs, it would have a negative impact on achieving organisational goals.

A hazard is an agent having the potential to cause harm or hurt to the target. We can call the possible source of danger as hazard. The terms 'risk' and 'hazard' are mostly used interchangeably. However, in terms of risk assessment, they are two very different terms. A hazard is any agent which can cause harm/damage/injury to human beings and their environment. Risk is defined as the probability that exposes one to a hazard which leads to a negative effect.

All industries have different type of tools, equipment and machinery. There is always a risk of hazard while operating machines. They may be physical, biological, chemical, mechanical, etc. It is crucial for all operators to be aware of the risk of hazards associated with the industry they work in. While handling tools and machines, the Operators should follow safety instructions. Specialised training must be given to the Operators to prevent injuries from these hazards. Operators should take precautions to guard against work related hazards and accidents.

Most manufacturing units have similar hazards in their processes and work areas. Hence, it is mandatory to have adequate equipment and facilities in the unit to avoid these hazards. Adequate planning, training and awareness workshops are necessary to train the Operators, in which they must be made aware of various hazards associated with their units, and the precautions to be taken.

All the manufacturing units, whether located in a commercial or residential area, must comply and should have the necessary equipment, like fire extinguishers, hydrants, emergency exits, emergency lights, hooters, first aids, etc. The Operators may suffer many occupational accidents due to the processes and equipment or machines used in the garment industry. It is the prime responsibility of an organisation to provide occupational health and safety conditions to the Operators.



Type of hazards

In a garment manufacturing unit, all the hazards mentioned in this session may not be common, but awareness about various hazards is essential to be able to deal with them in case they occur. Different work environments can pose different type of hazards and risks to the health of the Operators. Therefore, it is important to identify and address the different type of hazards with appropriate safety measures, not only by the employers but also for each individual to be responsible for the safety and welfare of the self, all persons working in the organisation as well as the environment.

There is always a threat to the health and safety of people at the workplace. These may be chemical hazards, physical hazards, biological hazards, etc. Here we have discussed some hazards keeping in mind the exposure of students of this course towards machines and industry.

Physical hazards

They often affect many Operators in the workplace, for example occupational hearing loss, postural defects, falls, accidents, etc. Hearing loss is one of the most common problems in a manufacturing unit with heavy noise-making machines like some industrial sewing machines or cutters; postural defects like cervical and bone shape change can occur if a person needs to sit or stand in a particular wrong position for long time. Accidents and falls are also a common cause of occupational injuries and deaths in industries, like transportation, construction, extraction, healthcare, building, etc.

Some of the problems associated with the physical environment at the workplace include:

1. respiratory problems, allergies, skin problem, etc., may be caused due to excessive dust. Adequate ventilation, exhaust fans, etc., are helpful to make the environment clean and dust-free.
2. a low light environment for working, and shortage of eye protective glasses, can cause eye problems.



3. prolonged sitting, and continuous work involving the eye, creates eye problems (strained eyes) and backbone problems for the Operators. Repetitive Strain Injury (RSI) is likely to occur at the workplace due to long hours of sitting to complete the work. Problems like backache, stiffening of neck, cervical and wrist joint problems can also occur during stitching work.

These problems can be solved with the following tips.

1. Always work with the right body posture.
2. Keep the stand/machines at a height till bust level and straight wrist position to avoid bending your neck and back for a long time.
3. Use wrist rests to avoid strain in the hand and wrist joint.
4. Take short breaks from long sittings, maybe after an hour or two, to relax the strain in the back.

Fire hazards

They are common in those industries that use a lot of flammable material, like cotton, chemicals, etc. Fire hazards occur mainly due to the following reasons.

1. Improper working of fire and smoke alarm bells in industries
2. Absence of fire and smoke alarm systems in many industries
3. Improper maintenance of fire exits or emergency staircase
4. Lack of proper exit route or emergency staircase to reach the place of safety

Every industry should keep fire extinguishers as a safety measure.

Biological hazards

These involve hazards due to bacteria, viruses and toxins. It can be due to non-



Fig.5.1: Fire extinguishers



NOTES

airy and dark rooms, suffocation (bad ventilation), and unhygienic conditions of washrooms. These also include animal bites and stings, problems from toxic plants, and transmitted diseases through animals.

Chemical hazards

Some chemicals can cause a hazard in the work area. There are many categories of hazardous chemicals. Certain chemicals are harmful when mixed with other chemicals. Chemical hazards are very common in apparel and textile industry while at the time of dyeing and printing.

A worker in the garment industry should practise caution while handling chemicals. The worker must be made aware of the specific instructions to be followed while handling a particular chemical.

Psychosocial hazards

This means that the status of mental health and emotional well-being of the Operators in an organisation may not be normal. These could be due to a feeling of job insecurity, long working hours, lack of enthusiasm towards work, frustration about not being allowed to deliver quality product due to pressure of quantitative production, harassment at workplace and poor work-life balance. This aspect should be dealt with care, as these are sensitive issues. Behavioural therapy, like continuous counselling, meditation, yoga, participation in recreation centres, music therapy or occupational care are effective in reducing sick leave days and poor work efficiency at the workplace.

Electrical hazards

These are common in the textile industry as fabrics, machines and other fire-prone equipment are being dealt with here. It is quite dangerous when an Operator creates an electrical contact with keyed up equipment or a conductor. Electrical accidents mostly occur when the individuals are working around electrical apparatus which is live but they think it is dead. Wrong use of equipment and use of faulty electrical equipment also causes accidents. Working on, or near electric



equipment, without adequate training or appropriate equipment, may be one of the reasons.

Shocks from faulty equipment can lead to brutal and permanent injuries. Due to serious injuries, the chances to fall off from ladders or other work platforms are high. Apart from injuries or accidents, such mistakes or avoidance lead to damage of the plant, machines, equipment and property.

To reiterate, it is the role of the management to provide basic facilities like day care, canteen, rest room, recreational room, dispensary for first aid, etc., so that the Operators focus on their routine work in the units, uninterrupted. Critical emergency essentials, such as alarms, evacuation plans, emergency lights and gathering areas, must be invested in. There is a lot of machinery used in the garment industry. However, before any work starts on a machinery, the Operator should be trained in its proper operations and all safety precautions should be taken. Proper training and demonstration of work technique or process is valuable for each Operator.

Table 5.1: Some Common Hazards and Potential Accidents and their Preventive Measures

Common hazards	Preventive measures
Finger and hand injury during cleaning and repair work	The machine must be switched off, with the plug removed, and must be stationary before any cleaning or repair work is started.
Eye injury from broken parts accidentally entering the eye	Proper adjustment of the eye guard should be checked before work starts. Safety glasses should be used.
Finger injury from the needle	Setting of the finger guard should be checked before work starts
Injury from tools and equipment of drafting cutting and measuring tools	Shears and needles should be put at the right place after use.
Electrical injury	Never use a machine with damaged covers, cables, switches, etc. Report the damage at once. Never try to repair it yourself.



NOTES

Internal injury from accidentally swallowed items	Never store items temporarily in the mouth. Place needles, etc., in suitable containers.
Tripping and falling in the surrounding work area	The work area must be clean and tidy.
Fire hazards: loss of life and damage to machinery due to electric short circuit or welding operation	Place MCB (Motor Circuit Breaker), ACB (Air Circuit Breaker), restrict unauthorised person for welding

Practical Exercises

Activity 1

Prepare a chart of the hazards in the garment manufacturing industry.

Material Required

1. Pen
2. Glue
3. Chart sheet
4. Pictures of hazards related to the garment manufacturing industry

Procedure

1. Search pictures of various type of hazards in the industry through the Internet and books.
2. Collect pictures of various type of hazards in the industry.
3. Cut the pictures very neatly with scissors.
4. Paste them on a chart sheet.
5. Label them.
6. Place the chart in classroom/practical lab.

Activity 2

Students will watch a short video on the hazards that occur in the garment manufacturing industry and the safety measures that should be taken. Prepare a report of it.

Material Required

1. CD/DVD of short video
2. Internet access for online video
3. CD/DVD player or laptop
4. Projector
5. Screen
6. Seating arrangement for students



Procedure

1. The teacher should arrange to make the students watch a short video on the hazards in industry and safety measures.
2. The teacher should organise a group discussion regarding the same.
3. Following the instructions of the teacher, prepare a report on the hazards in the industry and the safety measures.

Check Your Progress

A. Fill in the blanks

1. Excessive dust can cause respiratory problem, _____, skin problem, etc.
2. RSI stands for _____.
3. Biohazards involve contagious bacteria, _____ and _____.

B. Find the following words from the maze below

HAZARD, MACHINE, INJURY, ELECTRICAL, ACCIDENT, ALLERGY, DAMAGE, RISK, HURT

H	I	N	J	U	R	Y	A	M	E
A	A	S	T	R	A	I	N	A	L
C	A	Z	K	H	U	R	T	C	E
C	Z	D	A	M	A	G	E	H	C
I	B	R	L	R	I	S	K	I	T
D	M	E	L	G	D	S	C	N	R
E	S	H	E	A	R	S	R	E	I
N	P	O	R	J	P	K	M	S	C
T	Q	P	G	I	S	S	M	S	A
S	R	N	Y	N	U	V	N	S	L

C. Questions

1. Define the risks and hazards in the garment manufacturing industry.
2. List out the type of hazards in the garment manufacturing industry.
3. How can the management reduce the risks and hazards in the garment manufacturing industry?
4. Write at least two physical hazards that might be faced by the Operator and give causes and precautions to avoid them.



SESSION 2: HEALTH AND SAFETY MEASURES FOR SEWING MACHINE OPERATOR

It is always very important for an Operator to be aware of the hazards associated with sewing machine operations as many of the injuries are caused by error, carelessness or inattentiveness on the part of the Operator. The Sewing Machine Operator should take precautions to guard against work-related illnesses and injuries. The Operator must be trained to handle and operate the sewing machine properly and safely. One should follow all safety precautions.

Sewing Machine Operators should follow these safety precautions while working.

1. While sewing always concentrate on the machine and the task at hand.
2. Always use shields and guards while working with the open moving parts of machine.
3. Use safety glasses and earplugs while working on high-speed sewing machinery.
4. Always wear proper footwear to avoid leg and feet injury. The footwear worn should not slip off from the feet while operating the machine.
5. Turn off the sewing machine before oiling it or while changing parts.
6. In the event of a cut wound, or any other injury, immediately report to the group leader. Wounds should be cleaned and covered with a bandage.
7. All tools and machinery required for production should incorporate ergonomic design principles and should not require an excessive force to operate.
8. The tools should be easy and comfortable in holding and using.
9. Work area should be properly designed like enough space for performing tasks, appropriate working height and proper sitting arrangement.
10. Improper furniture and poor ergonomic conditions lead to serious health problems such as musculoskeletal disorders for example carpal tunnel syndrome, lower back pain, forearm tendinitis, neck pain, etc.





Fig. 5.2: Operators working on a sewing machine

11. Unpadded stools that may also lack a backrest lead to the Operators having to sit in an uncomfortable position without adequate support for the entire working shift.
12. If there is constant use of pressing irons in sewing units, the humidity level becomes very high, which may create discomfort for the Operators.
13. Be provided with short breaks to prevent muscular pains.
14. Take proper physical rest and mental relaxation in order to prevent injuries.
15. Adopt an appropriate sitting posture while working. Avoid working in uncomfortable and awkward postures.
16. Do not work with hands above the shoulder height on a regular basis. Arms must be placed at a lower level and near to the body. Frequent bending and twisting of wrists, back and neck should also be avoided.
17. Operators should take proper rest. Give your muscles rest during the tea/snacks break, lunches and weekends by doing something different from what is routine.





Fig. 5.3: Sitting position while working on a sewing machine

Good lighting

Proper lighting at the workplace is very essential for productivity. Conversely, poor lighting can cause eye strain, fatigue and headache, which results in poor productivity.

Practices for good lighting

1. There should be an arrangement for proper natural lighting in the sewing department/unit. This may help decrease the electricity bill.
2. Work stations that need more light should be moved closer to the windows.
3. Use a combination of natural and artificial lighting arrangement, and try to adjust the lighting at the work area such as, drafting and cutting.
4. The interior colour of the walls affects the illumination needed. Make sure that the ceilings should be as close to white as possible. Use pale colours on walls.

Benefits

1. Good quality of work with less faults and high production



2. Decreased tiredness and work-related illnesses, like itching and strain in the eyes
3. Better health of operators will decrease the number of sick leaves, and increase productivity

Other things to consider

Many a times, chemicals are used for different processing in textile and garment industries. Dyes, solvents and other chemicals are used to create different fabric finishes. Hence, proper ventilation, respiratory protection, and other personal protective equipment should be readily available to protect Operators during chemical processing.

As a lot of work involves close viewing of the fabric, material or garment, eye protection is critical. Operators in the garment industry can avoid eye injuries by using proper shields on high-speed sewing machinery or appropriate safety glasses.

Before using any tool or machine, the Operator should be trained in safe working practices. Some of the measures are given below.

Safety measures to prevent accidents with scissors

Hand scissors can cause accidents when not used properly. Scissors injuries usually happen when the scissors slips during cutting or trimming. In most cases, the blade cuts the Operator's hand and/or fingers. Injuries can also occur to other parts of the body. The following safety measures should be taken.

1. Use suitable storage system, such as racks, boxes, etc., near the working area at a comfortable height to place scissors, blades, etc., after use.
2. Ensure placing lighting fixtures in a way that the light should fall on the working surface from the left side or from the front. This promotes better visibility.
3. Prohibit carrying scissors in pockets, or in the hand when going from one place of work to another.
4. Do not hold scissors with sharp sides up. Do not use it when the middle screw is loose.
5. Fix disposal points for used blades.



NOTES

6. Use protective footwear with adequate resistance to slipping and penetration from a dropped scissors or other sharp objects.
7. Avoid leaving scissors around the work area. This can injure both the Operator as well as others walking around.
8. Provide even floor surfaces with slip resistance so the operators do not slip.
9. Free the work surface and floor off debris (pronounced as day-bree) and other waste to avoid tripping and falling.

Safety measures to prevent accidents with needles

1. Keep needles and pins at a fixed place, such as in a special box, and all small tools in separate bags or boxes. Do not leave them at the workplace.
2. Do not hold the needle, pins, etc., in your mouth or tuck them in the clothes. Do not leave it in the fabric too. An Operator can sew through one's finger.

Safety measures while using spray guns

Spray guns are used to get rid off any stains on the fabric that may have been transferred while manufacturing. These guns use a cleaning fluid (many times ethylene) which may cause headache, dizziness and fatigue if inhaled, or spirit which can cause redness and excessive dryness of the skin, if exposed.

Train the Operators in the use of the gun. Spray the cleaning fluid onto a rag and then use the rag to clean, rather than spraying on the garment directly.

Safety measures while ironing

1. Practise caution while using a hot iron as it can cause a major injury.
2. Check for any faults with the cord before using it.
3. Turn on and hold the plug with dry hands.
4. Place the iron only on a heat-resistant stand.
5. Ensure that the cord does not touch the iron soleplate while ironing.
6. Select an ironing mode (heating temperature) suitable for the fabric to be ironed.



Safety and navigation symbols

A signage or symbol is a picture, written word or mark that represents a message. It is important to know the different type of symbols used in a workplace so that they can be followed. There are two type of symbols—safety symbols and navigation symbols. Safety symbols are those used for warning and the protection to be taken. Navigation symbols are used to show the direction or placement of a certain object or department. Some of the commonly used symbols are shown in Fig. 5.4.



Symbol for explosives or an explosion hazard



Sign to prohibit flames and smoking



Sign indicates flammable gas



Hazard symbol for nonflammable gas



Sign for protective eyewear



Sign for eye protection required



Symbol for gloves required



Sign for protective footwear



Sign for protective clothing



Sign for ear protection required



Sign for fire extinguisher



Sign for escape route



Symbol for first-aid





Hazard symbol for toxic



Hazard symbol for a corrosive substance



Symbol for fire exit



Hazard symbol for a harmful or irritant substance



Hazard symbol for flammable



Hazard symbol for oxidising



Warning sign



Symbol for no sitting



Sign for fire alarm

Fig. 5.4: Safety and navigation symbols

Practical Exercise

Activity 1

Search from the Internet and books, and list out the safety and navigation symbols used by a Sewing Machine Operator in the garment industry. Prepare a chart of the same.

Material Required

1. Chart sheet
2. Pictures of safety and navigation symbols
3. Glue
4. Scissors

Procedure

1. Search and collect pictures of safety and navigation symbols from the Internet and books.
2. Cut the pictures very neatly with scissors.
3. Paste them on a chart sheet.
4. Label them.
5. Display the chart in the classroom/practical lab.



Check Your Progress

NOTES

A. Fill in the blanks

1. Operators should wear proper _____ to avoid leg and feet injury.
2. Working with improper and insufficient light results in eye strain, _____ and _____.
3. Operators should take proper physical rest and _____ in order to prevent injuries.
4. Always use _____ and _____ while working with open moving parts of machine.
5. Short breaks are necessary to prevent _____ pain.
6. There are basically two type of symbols — _____ and _____.

B. Short answer questions

1. Write a short note on good lighting while working in a garment manufacturing industry.
2. Write short notes on any five safety practices while working on sewing machines.

C. Long answer questions

1. Why is it important to take health and safety measures for a Sewing Machine Operator in the industry?
2. Write about the importance/benefits of good lighting for the Sewing Machine Operator.

