

IN-SIGHT

Lead Article:
Loss Prevention in Textile Industry



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Dr. Amarnath Ananthanarayanan

CEO & MD

Bharti AXA General Insurance Company Limited

Message from CEO and MD

The advent of a new year does always usher in hope, happiness and energy and makes us eagerly look forward to newer goals and accomplishments. It also provides us an opportunity to re-wind and look back at things so that we could re-focus our efforts and energies in a way that would bring in more success. By and large the year that had gone by has been a very eventful year for the General Insurance Industry in India. Events such as dismantling of motor pool, increase in rates for Nat Cat perils, increase in deductibles under fire and engineering policies, increase in liability premium rates for motor are ones that impact the business and profitability of general insurers. Positives for the year include features such as the Non life industry growing by 23% from INR 47373 crores to INR 58344 crores, decrease in overall incurred claims ratio from 93% to 88% and 15 non life insurers showing a reduction in claims ratio. While the future for general insurance industry in India looks bright, the challenge lies in meeting the ever rising expectations of customers to which the industry needs to respond with fundamental changes regarding products, distribution, service and technology. Considering the talent and innovation that is available in the industry I am sure that the general insurers will rise up to the occasion and deliver.

Wishing all our readers a very Happy, Prosperous and a Safe New Year.



Subrahmanyam B.

Sr. VP & Head, Health and Commercial Lines

Bharti AXA General Insurance Company Limited

From the Editors Desk

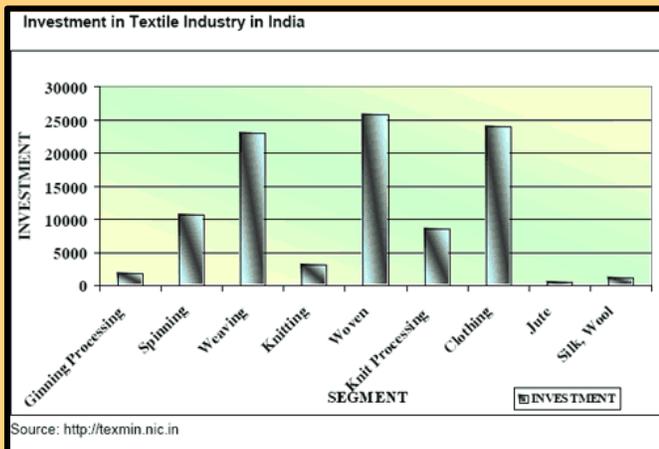
Textile industry is amongst the oldest manufacturing sectors in India and also ranks amongst the largest industries in this country. There are quite a lot of credits that this industrial segment brings to our country. These include - being the world's second largest producer in textiles after China, the third largest producer of cotton in the world behind China and USA, and the second largest cotton consumer in the world after China. Though the industry was predominantly unorganized even a few decades back, the scenario did change after economic liberalization in 1991 and set in motion a more organized growth story. This industrial segment employs around 35 million persons today and earns about 27% of our foreign exchange. It is this background that has made us focus the lead article for this issue on hazards and loss mitigation measures pertaining to the textile industry. The issue also includes a safety quiz and a case study on a fire loss that took place in a textile industry recently.

We wish our readers a happy and informative reading experience.

1.0. Lead Article : Loss Prevention in Textile Industries

1.0 INTRODUCTION

Textiles are amongst the most important industrial segment in India today. Besides earning 27% of our foreign exchange and providing employment to around 35 million persons this segment accounts for 14% of our industrial production and contributes around 3% to our GDP. The graph below gives a view of the investments that take place in our textile industry.



From this it can be seen that the highest investments take place in spinning, weaving and clothing sectors and it is mainly due to the termination of Multi Fiber Agreement (MFA) in 2004 followed by opening up of the market since 2005 and integrating the Indian textiles and clothing industry into the World Trade Organization (WTO). Now-a-days, most of the developed countries are experiencing a decline in their textile and apparel trade, creating new

opportunities for developing countries like India in this sector.

Textile Industry - Overview						
Item	Unit	2007-08	2008-09	2009-10	2010-11	2011-12 (Prov)
Textile Mills (Non-SSI)						
Spinning Mills (Non-SSI)	No	1597	1653	1657	1757	1761
Composite Mills (Non-SSI)	No	176	177	177	183	196
Total	No	1773	1830	1834	1940	1957
Exclusive Weaving Mills (Non-SSI)	No	179	184	184	174	173
Spinning Mills (Non-SSI)	No	1219	1274	1249	1333	1336

Source: Office of Textiles Commissioner, Mumbai; Last updated on 19.06.2012

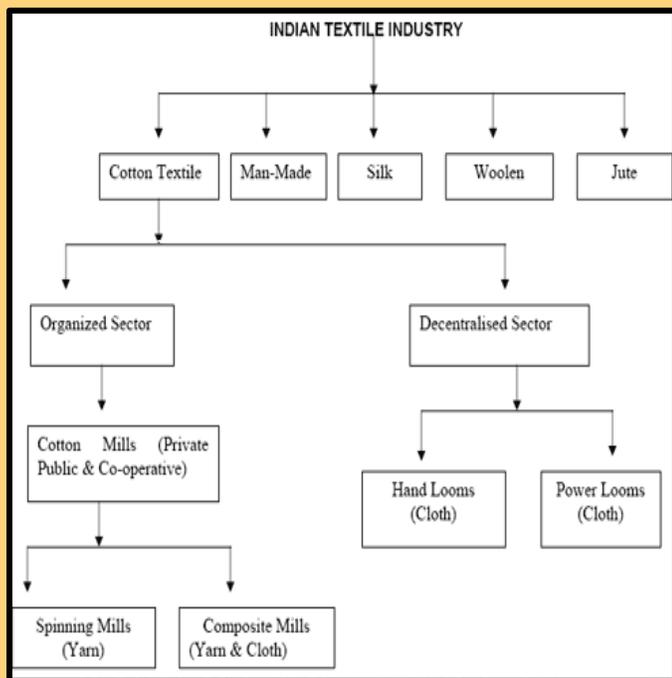
2.0 GENERAL PROCESS

Textile is a very big industry engaged in the manufacturing of a variety of end products using different raw materials. Amongst these, cotton textiles are the most predominant.

The textile industry is a conversion process industry in which the raw material in the form of cotton and/or synthetic staple fibre is converted into yarn (pure cotton and/or blended) and then woven into cloth. The process of structural conversion of fibre into yarn is called 'spinning' and the conversion of yarn into cloth is known as 'weaving'. After weaving, the cloth is processed with various chemicals and dyes to

obtain various marketable products. The main application on end users is cloths and garments.

There is another division of textiles, known as 'Technical Textiles'. This is a highly potential and emerging sector in India. These are functional fabrics and have typical applications for a diverse range of economic activities like automobiles, civil engineering and construction, agriculture, healthcare, industrial safety, personal protection etc. Based on the usage there are 12 segments of technical textiles which are 'Agrotech', 'Meditech', 'Buildtech', 'Mobiltech', 'Clothtech', 'Oekotech', 'Geotech', 'Packtech', 'Hometech', 'Protech', 'Indutech' and 'Sportech'. The trend of producing different technical textiles in our county is slowly but steadily increasing. The pictogram below gives



an overview of the Indian textile industry.

The focus of this issue is restricted to cotton textiles namely - spinning, weaving and cloth processing including composite textile mills.

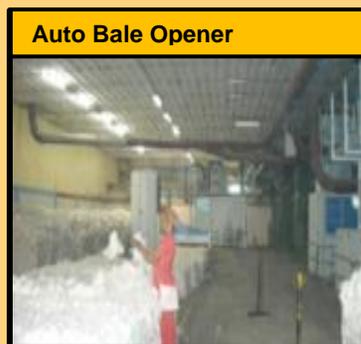
2.1 PROCESS DETAILS

The following are the main steps in a cotton/synthetic/blended textile mill process:

- Blowing and Mixing (Blow Room)
- Carding
- Lap Forming, Combing, Drawing and Roving (Speed Frame)
- Spinning (Ring Frame)
- Winding, Warping and Doubling
- Weaving (Loom) and Knitting
- Cloth Processing (Fabric Beaching, Finishing, Dyeing and Printing)

2.1.1 Blowing and Mixing

The cotton and/or synthetic fibres are received



from ginning and pressing factories and/or manmade fibre manufacturing units in fully pressed bales (FP Bales) and stored in the

respective godown. The FP Bale gets opened in the bale opener which is a machine combination of discs with bent spikes rotate on a vertical axis. The fibres are spiked, centrifuged, opened out and sent to the blow room for maximum cleaning.

At the blow room, the semi-opened fibres are cleaned thoroughly using various spiked wooden lattice and blowing of air. The final formation of fibres is in lap form, sent to the next operation i.e. carding section manually. An automatic system has been introduced about 3 decades ago called chute feed arrangement wherein the compressed air is used in the blow room machines to blow the opened fibres into the carding machines directly through chute duct, passing through the separating wall between the two departments i.e. Blow Room and Carding.



2.1.2 Carding

The processes involving the machineries e.g. carding, draw frame, lap forming, combing and speed frame is collectively called 'preparatory'. Carding is mainly used to further loosen and lay the fibres in a straight position for helping in

spun evenly. Very tiny and sharp edged hooks are fitted on to the rollers of a machine having small gaps between them, helping in straightening the curly fibres, is called 'cards'. In the final stage of carding, web formed fibres collectively form a rope, called the sliver. As this is the heart of all operations for forming loose fibres to rope (sliver) and also very important operation for its quality measures, in textile industries, the carding machine is also known as 'Engine'.

2.1.3 Lap forming, Combing, Drawing and Speed Frame

Lap forming is the process where slivers from various cards collectively pass through it forming a wide lap for feeding into the combing machine. Combing is used to eliminate the unwanted very fine dust and dirt in the slivers and also the short fibres, if any, for its absolute cleaning. Many a times, this process is bypassed depending upon the quality of the yarn produced. However, this process is useful only to cotton fibres and not synthetics. For further fibre to fibre mixing and to make it parallel laying, drawing is the process where several carded and/or combed slivers are combined and reduced in size to one uniform sliver using optimum draft.

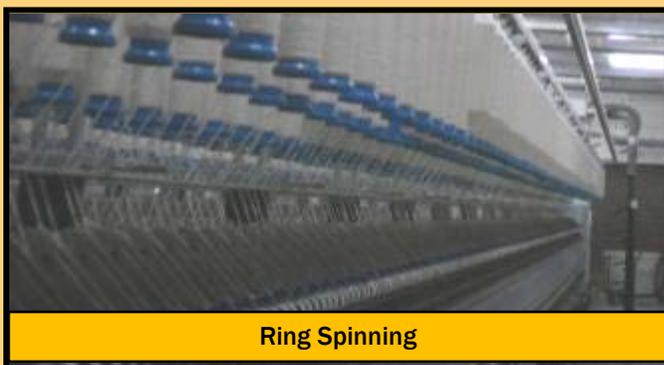
Roving processes carried out in speed frame following drawing operation in which coarser

threads (finer from sliver) are obtained to make it ready to feed it to spinning.



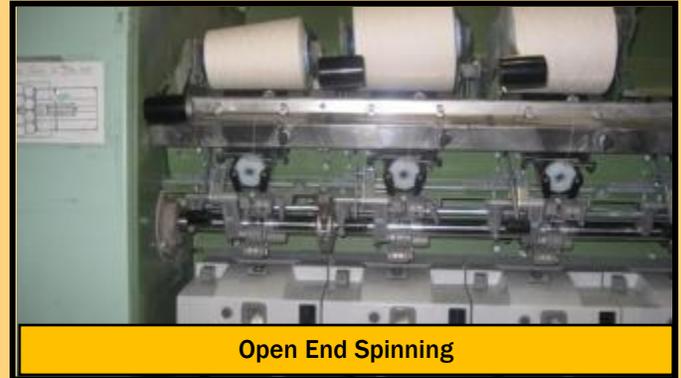
2.1.3 Spinning

From the roving thread produced in speed frame, finer usable and marketable yarn is produced by passing it through several spools one after another stretching it very precisely called 'draft'. The pulled thread is then twisted using various grades 'traveler', a tiny special ring attached to the grooves of ring, underneath this row of spools, where a row of spindles revolves at the centre of the ring very fast to spin the yarn wound around the spindle.



There is an innovation in spinning section wherein the yarn manufacturing can be done in a specialized machine called 'Open End Spinning' directly from the feed material of

sliver bypassing the speed frame. This machine however is very useful for high productive coarser yarn with less investment of time and money but, not for finer yarn.



2.1.4 Winding, Warping and Doubling

Single defect free package with maximum yarn length is obtained in winding, most suitable for weaving. It is done for preparation of weft and warp yarn wound on respective bobbin/cone, collecting yarn from spinning. The yarn obtained from the winding is wound on the warping beam in warping machine, useful for warp yarn fit across the weaving machine. Doubling is an operation in which one or more threads are taken out and twisted in opposite direction to the original twist, rewound and a stronger thread is obtained.

2.1.5 Weaving and Knitting

In producing a fabric, spun or filament yarns cross each other at right angle in this machines. The yarn travelling lengthwise is called the warp and the other one travelling across, the weft. In conventional weaving, weft is laid across warp thread using shuttle however, now-a-days,

shuttle less high productive weaving machines are in extensive use wherein the weft thread moves across warp using water jet and air jet system, called water/air jet looms.



Knitting is also carried out in circular knitting machine where there is no requirement of weft inserting shuttles or jets across warp. The process is a loop forming techniques using couple of hundred of metallic hooks producing seamless fabric having no side edges, extensively used in soft and stretchable garment manufacturing.

2.1.6 Cloth Processing

Bleaching, finishing, dyeing and printing are carried out on fabrics and the department is called cloth processing department. For removing impurities from the cloth and also for obtaining an absolute white cloth, coming from weaving, bleaching is carried out. Bleaching liquor like caustic, hydrogen peroxide etc are used in this process and the bleached cloth is dried, dyed and printed.

For making the cloth surface smoother, 'singeing process' is sometimes being used using direct flame out of LPG applying on the cloth surface, allowing burning off only the extra unwanted fibres projected on the cloth surface.

3.0 HAZARD IN TEXTILE INDUSTRIES:

3.1 Health Hazard

Textile is rated at 5 amongst the top ten skin-unfriendly occupations. At each stage, there are irritants or allergens that are a potential cause of dermatitis.

Synthetic and wool fibers tend to be most irritants due to exposure to dust. It can cause bronchitis and acute byssionosis (also called "brown lung" or "Monday morning fever"). This exposure can cause lung airway obstruction (which reduce ventilator capacity) and lead to disability and premature death.

The process of making yarns and preparatory section exposes to the irritants such as spinning oil, heat and polyvinyl alcohol.

During weaving also the same irritants as in case of spinning apply.

Noise is the most irritant in the departments especially, spinning and weaving. Exposure to high levels of noise can cause permanent hearing loss. Neither surgery nor a hearing aid can help correct this type of hearing loss. Short term exposure to loud noise can cause a

temporary change in hearing or a ringing in ears. These short-term problems may go away within a few minutes or hours after leaving the noisy area, however, repeated exposures to loud noise can lead to permanent tinnitus and/or hearing loss.

Cloth processing is very prone to skin disease. The two groups of dyes i.e. 'reactive' and 'disperse' are the most frequent sensitizers. Chemicals and metals used are mordants to give color their permanence, can be irritants or allergens. Exposed to a number of chemicals, like benzidine, optical brighteners, solvents and fixatives, crease-resistance agents releasing formaldehyde, flame retardants that include organophosphorus and organobromine compounds and antimicrobial agents can cause high degree of colorectal cancer, thyroid cancer, testicular cancer and nasal cancer.

3.2 Fire Hazard

In view of high degree of stock of combustible materials and presence of air supply in the departments, the textile industries are most prone to high fire hazard.

3.2.1 Raw Material Godown

Huge quantity of cotton and/or synthetic fibres in fully pressed bale (FPB) is stored in the specified godown. The godowns are generally provided with no electricity and operate only during day times. The bales are normally very tightly held, coming from press house of ginning

and pressing factory, in the cotton growing belt, using iron strips. There could be a chance of rubbing of these hoops against each other during stacking or stripping off the same due to over pressure developed in bale or by any other reason, which may cause the sparks. Now-a-days, due to this reason, plastic strips are used to avoid such accidents. Human negligence in the form of throwing lighted cigarette or beedi butts is another source of ignition. A bad housekeeping leads to the spread of fire, causes a major loss. Usually, a large quantity of stock is held in the godown, especially the cotton, due to its seasonal and economic reason, the fire is always very intense. In view of generation of lot of heat and smoke in the godown, the fire fighting operation becomes very difficult leading to a major loss. This is the area due to which the any fire loss is very severe in this sector.

3.2.2 Blow Room

Various impurities such as dust, dirt, metallic particles, stone etc. are available invariably in the fibres bale especially cotton bale, can cause sparking inside the machine and lead to a major fire, if not been attended immediately. Presence of fluff inside the blow room cellar, inside the casings of electrical motors and fittings and in and around the blow room area can also cause rapid spread of fire in the event of accidental ignition due to faulty presence of various electrical illumination therein. The chute feeding arrangements can cause spread of fire to

carding section very easily. Blow Room causes very high frequency of fire incident and if not attended fast, can lead to a major fire loss.

3.2.3 Carding & Spinning

Chances of fire are comparatively less in the preparatory section including the ring spinning section than the blow room. The machineries used here are running at a speed that can cause spark due to accidental frictional contact between them in addition to electrical spark in the faulty electrical installation connected to lighting wiring and various machineries. The fire can easily catch and spread fast in this department due to the presence of fluff in the false ceiling and on the machineries. Chances of generating static charge accumulation in these high speed machines is high due to the large number of fast rotating moving parts.

3.2.4 Winding, Warping, Doubling, Weaving and Knitting

These are the departments where hazard is comparatively less. However, fire can still ignite due to faulty electric short circuits and convert to a devastating one due to accumulation of fluff and bad housekeeping.

3.2.5 Cloth Processing

This department is very less prone to fire loss but, can turn to be a devastating one due to huge accumulation of fabric stock along with

presence of very combustible chemicals like resins, binders and solvents with very low flash point, being used in fabric cleaning, dyeing, polymerization etc. Use of hazardous chemical solvent in chemical mixing using electrical motor driven mixing rod, can develop a chance of fire incident due to short circuit. Further, a chance of generating static charge accumulation due to high speed rotating machines in the container cannot be ruled out. Chances of fire is very high while carrying out drying process of cloth especially in the stenter machine due to over drying of same caused by malfunctioning of its auto cut off operation and faulty exhaust system attached to it. Faulty housekeeping generally converts the small fire to uncontrollable major one in this section.

4.0.FIRE DETECTION & PROTECTION

4.1 Fire Detection

Godowns are closed during night and the supply and return air ducts for humidification plant including false ceiling areas in various sections are always unmanned. So, it is vital to provide automatic smoke/fire detection system in these areas to facilitate an early detection of fire. Smoke detectors happen to be the most commonly used fire detection devices in godown including the false ceiling areas and infrared detectors in the ducts. Such type of detectors is also very effective in clean locations such as IT/severs rooms, process control rooms, and

administrative offices. Automatic smoke/fire detector/alarm system conforming to IS: 2189-2008 "Code of practice for selection, installation and maintenance of automatic smoke/fire detection and alarm system" would be advantageous for cotton godowns. Similarly, linear heat sensing cable which doesn't require frequent maintenance is very effective in the cable galleries/racks especially in the main substation distributing power to all.

4.2 Fire Protection

- Passive Fire Protection Systems
- Active Fire Protection Systems

4.2.1 Passive Fire Protection

IS: 3079-1990 "Code of Practice for Fire Safety of Industrial Buildings: Cotton Textile Mills" and IS: 3594-1991 "Code of Practice for Fire Safety of Industrial Buildings: General Storage & Warehousing including Cold Storages" should be followed as the basis for construction of textile process units and godowns. The Building Regulations of the Tariff Advisory Committee (TAC) also provide very useful guidelines.

Fire water logging due to non provision of drainage in godown is a common phenomenon and can lead to a major loss. In case of a storied building, the upper floors should be of water tight construction and scuppers of not less than 20 sq. cm cross sectional area should be provided at no more than 6m. distance. External drains should not be less than 25cm. width and

30cm. depth and be provided along the sides of the godowns.

In case of ground floor godowns, the floor level inside the godown should be higher than the door sill and the floor should have a slope towards the door with a gradient of 1 in 100.

In absence of smoke vents there is smoke logging and hampered fire fighting operations may also result in early flashover. To avoid this, manually operated smoke vents should be fixed at roof level. The smoke vents may be of a size not less than 1.3 sq. m, distributed in such a way that the venting area is at least 1 sq. m. per 50 sq. m. of floor area. In addition, a normal venting system to godown is insisted.

Fire barrier wall conforming building regulation of TAC should be constructed between the storage and process area to avoid passage of flames and smoke from one section to another and vice versa and wall openings provided therein should installed with fire proof door having at least 4 hours fire resistance as per IS: 1942-1989 "Code of practice for fire safety of buildings (general) Details of construction". The fire doors should always be maintained in good working condition and kept in closed position when not in use.

A minimum distance of 2 m. should be maintained between bale stacks and godown walls and the maximum height of a cotton bale stack should be 6 m. or up to a level which is 1

m. below the roof, whichever is less.

Main electrical switch meant for specific godown/process block should be located outside the concern block so as to easily isolate the power supply during non working hours to prevent any short circuit, undetected during closer of the specification block.

Magnetic separators or electronic metal detectors provided in blow room machinery should be checked periodically for efficient functioning.

Automatic fire Dampers should be provided in humidification ducts and their actuation should be interlocked with the Air Handling Units.

The steam generating plants and power generation units should be housed in separate enclosures/buildings adequately segregated from the process and storage areas.

Cloth singeing room where LPG or petrol are used should preferably be located in a detached block or, alternatively, may be segregated from other process and storage blocks by providing fire proof wall with fire proof doors as per TAC rule and also the explosion venting of light roof arrangement should be designed as per NFPA Code 68. It is also to ensure that the LPG line entering the building has an isolation valve which is clearly marked and located in an accessible position. The LPG lines should also be painted with "Yellow" colour code for the purpose of easy identification.

Periodical cleaning and inspection should be ensured for the lighting enclosures. Provision of cable glands of proper size in electric terminal boxes reduces fire hazard. Preventive maintenance schedule for all electrical equipment helps in detecting possible failures in advance.

At least 1.5 m. gap should be maintained between the stock of any combustible materials and electrical fittings or equipments.

4.2.2 Active Fire Protection

Fire extinguishing hand appliances conforming to IS: 2190-2010 "Selection, installation and maintenance of first-aid fire extinguishers - Code of practice" should be provided at suitable locations in the vicinity of godowns outside and inside the process block. The extinguishers should be at such a distance that nobody needs to travel more than 15 m. to fetch extinguishers during emergency.

Fire hydrant system designed as per TAC norms or NFPA should be installed all over. Once installed, should be periodically monitored and tested for its best functioning during the emergency.

Installation of automatic sprinkler system in addition to hydrant system in textile industry is very effective for fire fighting. It is strongly recommended to install the same all over in the factory and it is very effective in high value

storage areas especially in godowns. Provision of sprinkler spot protection inside the blow room machineries is a good fire protection solution. A trained fire-fighting squad should also be available round the clock to fight fire apart from the system installed.

Wherever neither hydrant nor sprinkler system is available, an underground water tank of 50,000 litres is quite useful for the public fire brigade.

Fire can spread from Blow Room to Carding section through chutes in the pneumatic cotton conveying system and it can lead to major fire incident. Provision of an automatic CO₂ flooding system or flow diversion system in the chute fed blow room line is a best option to minimize this possibility.

Our ten loss prevention commandments for textile industries are given in the page that follows.

P. K. Roychowdhury

Zonal Manager – Risk Engineering

Bharti AXA General Insurance Company Limited

New Delhi

Ten Loss Prevention Commandments for Textile Industry

- 1. Godown:** In absence of smoke vents, smoke logging can hamper fire fighting operations. Manually operated smoke vents should be fixed at roof level in addition to normal venting system. Electrical lighting arrangement inside godown should be avoided; else electrical wiring should be carried out through metallic conduits and master control switch with an indicator lamp installed outside godown, switched off during non-occupancy hours. Smoke detectors conforming to IS: 2189-2008 or beam detectors where ceiling height is high need to be provided for early fire detection. Sprinkler system installation inside godown is the best fire protection option that is available.
- 2. Blow Room:** Magnetic separators/ electronic metal detectors to be provided in blow lines & periodically checked for their effective functioning. For chute feed blow room lines, provision of an automatic CO₂ flooding system or material flow diversion system is the best option that minimizes the possibility of a major fire. Provision of spot sprinkler protection inside the blow room machineries is another good fire protection feature.
- 3. Carding and Spinning:** Due to a large number of fast rotating metallic moving parts in this section, fire hazard due to static electricity arises. To avoid accumulation of static charges checking of electrical earthing arrangement of machineries need to be carried out on a periodic basis.
- 4. Housekeeping:** Since fire can easily occur and spread through a textile due to the large presence of fluff, periodic cleaning and housekeeping are important. Factors that help in improving housekeeping are well maintained humidification & floor extraction systems at all sections of textile mill and provision of automatic waste extraction systems for major machineries, provision of features such as overhead travelling cranes at spinning and weaving sections. Temporary wiring should be strictly avoided and periodical cleaning and inspection of lighting fixtures should be carried out. Provision of cable glands of proper size, a strict implementation of the preventive maintenance program on all electrical equipment and machinery helps in reducing the fire hazard.
- 5. Cloth Processing:** This department is less prone to fire. However potential for a huge loss is very high due to large amount of fabric being present together with combustible chemicals such as resins, binders and solvents with very low flash point that are used in fabric cleaning, dyeing, polymerization etc. All hazardous chemicals should be stored in a separate room and for use in the process area should be stored in a flame proof cabinet. Also mixing of hazardous chemicals should be carried out using pneumatic drives rather than electrically operated motors.
- 6. Singeing Operations:** Yarn or cloth singeing operations where LPG/petrol is used should be carried out in a detached block or be

segregated from other process and storage blocks by providing fire proof wall with fire proof doors as per TAC rule and also the explosion venting of light roof arrangement designed as per NFPA Code 68. It is also to ensure that the LPG line entering the building has an isolation valve, clearly marked and located in an accessible position. The LPG lines should also be painted with "Yellow" colour code for the purpose of easy identification.

7. **Hot Work permit system:** No hot work should be carried out inside manufacturing or storage blocks. Hence it is necessary that all hot work is carried out in a separate block that is located well away from the process and storage blocks.

8. **Human Health Safety:** Textile is rated at 5 amongst the top ten skin-unfriendly occupations. At each stage there are irritants or allergens that are a potential cause of dermatitis. Noise is a big irritant in spinning and weaving. Exposure to high levels of noise can cause permanent hearing loss. Personal protective equipments (PPE) should be provided to all working in the departments and their use should be religiously enforced.

9. **Fire Detection:** Smoke detectors are used as fire detection devices in godown and false ceiling areas and infrared detectors in the ducts. It is very effective in clean locations such as IT/severs rooms, process control rooms, and administrative offices. Automatic smoke/fire detector/alarm system conforming to IS: 2189-2008 "Code of practice for selection, installation

and maintenance of automatic smoke/fire detection and alarm system" would be advantageous for cotton godowns.

10. **Fire Protection:** Fire extinguishing hand appliances conforming to IS: 2190-2010 should be provided at strategic locations in the vicinity of godowns (outside) and in the process block (inside). Fire hydrant system as per TAC (India) or NFPA (US) norms should be installed all over the premises. The system should be periodically monitored and tested for its functioning to ensure its reliability during an emergency. Installation of automatic sprinkler system in addition to hydrant systems in textile industry is very effective in fighting fires. It is strongly recommended to install the same all over in the factory as it is very effective in high value storage areas especially the godowns. Provision of spot sprinkler protection inside the blow room machineries is a good fire protection solution. Provision of an automatic CO₂ flooding system in the chute fed blow room line is the best option minimizing major fire loss. Apart from the system installed, a trained fire fighting squad should be available round the clock in the factory to fight the fire.

2.0. SAFETY QUIZ

1. **The main cause of injury to young workers is:**
 - a. Slips and falls.
 - b. Burns
 - c. Breathing dangerous fumes
2. **How can a small contained fire be extinguished most easily?**
 - a. Use a fire extinguisher
 - b. Use water
 - c. Call the instructor
 - d. Smother the fire with a small container (i.e., a beaker)
3. **Most planning is a waste of time. We'll just dive in if we have an accident or injury and take care of the situation on the spot.**
 - a. TRUE
 - b. FALSE
4. **Young workers have faster reflexes, so they are less likely to be hurt on the job.**
 - a. TRUE
 - b. FALSE
5. **Workers in Ontario have three basic rights when it comes to health and safety. Which of the following is not one of your rights?**
 - a. The right to know about workplace hazards
 - b. The right to shut down an unsafe workplace
 - c. The right to refuse unsafe work
 - d. The right to participate in health and safety inspections and recommendations
6. **Most on-the-job injuries to young people take place in which industry?**
 - a. Service
 - b. Pulp and paper
 - c. Automobile
7. **What type of footwear is required in the lab?**
 - a. Shoes are optional
 - b. Hard-soled, covered shoes
 - c. Sandals
 - d. Something in a low heel
8. **Chairs or stools can be substituted for a ladder to get items out-of-reach as long as an employee "spots" the person using the chair or stool.**
 - a. True
 - b. False
9. **Your boss can fire you for refusing to perform unsafe work.**
 - a. True
 - b. False
10. **You have to play your part too if you want to work safely. Which of the following are among your responsibilities?**
 - a. Work smart; work safe - don't fool around on the job
 - b. Report unsafe conditions
 - c. Dress for the job - wear any required protective equipment or clothing
 - d. Get to know the emergency procedures
 - e. Report all injuries
 - f. All of the above

Answers:

1	2	3	4	5	6	7	8	9	10
a	d	b	b	b	a	b	b	b	f

Amol Gajbhiye

Regional Manager – Risk Engineering

Bharti AXA General Insurance Company Limited.

Mumbai

3.0. Loss Lessons: Fire in a Textile Industry in Silvasa, Dadra and Nagar Haveli

Date & Time of Loss: January 11, 2010 - 14:00hrs

Occupancy: Textile Industry

Probable Causes of Loss:

Collection of waste filament fluff and deposits in the chute could have got ignited on account of auto ignition due to the temperature of the hot air being exhausted from the blower section when no fabric was being processed through it could be the most probable cause failing which this could have occurred due to spontaneous combustion of the collected waste in the chute.

Reported Loss: INR12.33Lakhs

Premises:

The plant spread over an area of about 18,100 m² including the built up area of 10,600 m². Plant has Main production block housing Production activity, Maintenance work shop, Electrical substation and DG room, raw material & finished goods godown.

Incident:

Fire had occurred in the vapour extraction chute provided over the heating section of the stentering machine. The stentering machine is an old second hand machine installed 5 years ago.

At around 1400 hrs, one of the workers in the stenter department noticed a huge cloud of black smoke above the heating chamber of the stenter machine. The manual fire call point in the section was activated to communicate to others the occurrence of the fire. The thermic fluid heater supplying hot oil to this machine was immediately stopped and fire fighting was carried out by the factory workmen using portable fire extinguishers. Support of the neighboring factory was utilized in fighting the fire as one of their hydrant points was located close to the stenter area. Fire brigade which was immediately informed about the occurrence of the fire arrived at around 1505 hrs. Meanwhile the fire had been brought under control and fire brigade completed the fire fighting operations by breaking open the windows and drenching the area adjoining the vapour extraction chute of the stenter machine.

Fire zone was limited to the extraction chute and had not spread even to the other areas of the stentering machine due to fuel starvation and local fire fighting efforts. It was noted that even a synthetic piece of fabric tied near the exhaust hole of the vapour extraction chute had neither burnt nor charred.

Loss Prevention Recommendations

- Special emphasis must be given on regular cleaning of air ducts, all the machines, electric cables, switches, tube lights, etc. so that they are free of fluff accumulations. Frictional sparks or electrical sparks from such equipment can easily ignite the fluff.
- Provision of fire stops in the form of fusible link operated dampers within the air duct can be considered to prevent spread of fire via these air ducts.
- Dry-chemical extinguishers backed up with low velocity water spray from small bore hose reels would be effective for quick control and extinguishment of fires involving cotton fluffs and fabrics.
- Fire occurring in the premises during non-occupancy periods could remain undetected for a longer period of time resulting in its rapid growth and spread that could lead to a major loss. Hence, recommend to consider installation of smoke detectors in places like yarn and fabric storage, MCC room, Offices etc.
- It is recommend to provide Hydrant system to the entire plant which is designed in line with TAC's guidelines for hydrant system as given in their Fire Protection Manual

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Response Invite:

We invite your feedback on the contents and coverage we provide in our e-newsletter as also articles of interest on safety and loss prevention including fire loss case histories with loss lessons for publication over here. You may send us your feedback and articles at risk.engineering@bharti-axagi.co.in .

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