

## Safety Audit in a Milk Industry of Bangladesh

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### Abstract

*For the safety of the Milk industry and specially Milkvita Bangladesh took the initiative to investigate/identify the areas of improvement on safety through Audit/Observation. The research study includes analyzing the safety awareness and safety condition of a Milkvita Factory resulting in finding non-compliance issues and recommendations for correcting those issues to elevate or upgrade the safety scenario in working and operating the said Milkvita Factory. Parameters are taken in this study are: Equipment based analysis; Job based analysis; Location based analysis; Identifying the presence of resources including PPE(Personal Protective Equipment) etc; Checking on factory premises including factory access, weigh bridge area, roads, lanes and cleanliness related to Health Hazard; Preparing Accident record register in MS Excel; Factory Building design review & recommendation; Electrical Safety assessment & recommendation; Machine Safety assessment & recommendation; Identification and recommendation for occupational health; Evaluation of Fire fighting training & Drill. No secondary data was used. Research results shows that the mean fire risk index (FRI) is 3 on a scale of 5.0, which indicates an alarming condition. Locked exit doors, lack of emergency announcement system and lack of fire drills are the three worst performers among the 24 investigated parameters used in the study. Those parameters require immediate attention from the regulators and stakeholders. It is also observed that a U-shaped relationship between FRI and factory size has been developed. Factories that are members of the industry's trade lobby generally have better fire safety practices than the non-members. FRI for the industry can be very useful to understand the immediate concerns and thus to curb fatalities and injuries from fire accidents in this sector. Given the importance of the Milk industry may be supply quality and hygienic and quality milk to the customers. It is found from the findings that there is lack of training to the entire employee of the Milkvita Company.*

Keywords: Safety; Audit, Training; Fire Risk Index and Factory

### 1. Introduction

Milk production of Bangladesh is gradually increasing day by day due to proper nourishment of milk and milk industry. Milk industry in Bangladesh is increasing. But it is to be mention that Milkvita is one of the largest and pioneer of this sector. Milk is very much essential for the country people to meet up the nutritional requirements. Among all industries Milkvita is one of the industries where safety measures are taken. In factory cases electrical wiring, mechanical measures are taken for the safety of the employee and staffs. It can promote the production line and keep the factory free from hazards. To remove accidental facts it is very much need to improve safety measures. Milkvita has a variety of products such as Pasteurized Liquid Milk ,Flavored Milk ,Butter ,Full Cream Milk Powder, Skimmed Milk Powder, Ice-Creams, Ghee, Sweet Curd , Cream , Lollies ,Rasa Malai (sweet meat) , Condense Milk ,UHT Flavor Milk ,UHT Pasteurized ,Liquid Milk Chocolat  etc. All these products are from health hazards by the unique & systematic tools, engineering and technical helps of our resources personnel. By this way, the Milk industry is a highly competitive industry and cost-saving is highly valued, but, given the lack of a safety culture in the country in general, cost-cutting measures often affect the health and safety of the workers. Clothing is easily flammable and as such fire is one of the most sometimes and damage inducing accidents in these factories in Bangladesh. Cold and fire cause most of the injuries of milk industry, if industry can minimize that by providing suitable environment may get a good result. Cause of on-the-job injuries and fatalities in this sector. Each new incident of fire and related damage adversely affects the reputation of the industry. The Milk industry is a highly competitive industry and cost-saving is highly valued, but, given the lack of a safety culture in the country in general, cost-cutting measures often affect the health and safety of the workers. Clothing is easily flammable and as such fire is one of the most sometimes and damage inducing accidents in these factories in Bangladesh. Cold and fire cause most of the injuries of milk industry, if industry can minimize that by providing suitable environment may get a good result. Cause of on-the-job injuries and fatalities in this sector. Each new incident of fire and related damage adversely affects the

reputation of the industry. Despite a number of initiatives to curb fire accidents in the Milk factory, there are still a significant number of fire occurrences in this industry. Unfortunately, there is no comprehensive statistics on the current status of fire provisions and management practices in the Milk industry. Though Milk Vita is one of the largest organizations in Bangladesh its safety audit was not done before. This kind of audit can be very much innovative for milk industry, if any milk industry can perform all the safety measure. For this perspective, a safety audit can be done in Milk industry like Bangladesh Milk Producers' Co-operative Union Ltd (BMCUL) for achievement of better performance.

## **2. Brief History of BMCUL**

Dhaka Dairy Plant is a milk processing factory under the organizational trade name MILKVITA and the authoritative of LGRD ministry in Mirpur region, Dhaka. In terms of machineries, it is the largest milk industry of the country. Bangladesh Milk Producers' Co-operative Union Ltd (BMCUL) popularly known by its brand name Milk Vita, was established by the Bangladesh Government in 1973, immediately after the liberation war, based upon the recommendation by UNDP/FAO in the pattern of AMUL, India. The project was set up primarily at the four milk shed areas of the country. It was initiated as a development project of the Government titled "Co-operative Dairy Complex" with the objective of ensuring fair price for the poor, landless and marginal milk producing farmers of the rural Bangladesh and on the other hand to provide the city dwellers with a regular supply of fresh and hygienic milk and milk products at a reasonable price. The total project cost was Tk. 155.61 million comprising of a foreign exchange component of Tk. 61.07 million. Under the starting stage of the project 5 (Five) plants were set up followed by 7 (seven) more plants with self-financing. During the period of its activities, the organization has succeeded in bringing together over 160,000 farmer-members into the fold of 2068 village milk producers' co-operative societies who deliver milk to this organization twice a day, in the morning and in the evening. Thus, around 7, 00,000 farmer family members are being benefited by this organization. Moreover, the activities of Milk Vita have created about 4,000 job opportunities in the urban areas in addition to 1000 at its plant-levels. The co-operatives members get reasonable price of milk produced by their cattle with a guaranteed market. The project infrastructure further could drive away the traditional ghoses, the middle men, who used to exploit the farmers paying low price for their produces from centuries. The co-operative farmers are also given incentive bonus/price difference against their milk supply annually. Through its activities for the last 3 decades, BMCUL has made a significant impact on the national economy & especially in the milk production sector benefiting the farmers. At the outset of production, Dhaka City was earmarked as the target market. Gradually the marketing activities have been increased and expansion has been made to big city areas like Chittagong, Comilla, Feni, Rangpur, Brahmanbaria, Sreemangal, Moulvibazar and Sylhet etc. with the expansion of market and diversification of product range as per market demand.

## **3. OBJECTIVES:**

### **Broad Objective:**

In broad sense the safety audit is to make a report that where the factory needs to improve and what to do for a reputed milk industry.

### **Specific Objective:**

In some specific cases following objectives is need to observe for a large milk industry:

- Risk/Hazard Assessment and analysis
  - Equipment based analysis
  - Job based analysis
  - Location based analysis
  - Identifying the presence of resources including PPE (Personal Protective Equipment) etc.
  - Checking on factory premises including factory access, weigh bridge area, roads, lanes and cleanliness related to Health Hazard.
  - Preparing Accident record register in MS Excel
  - Factory Building design review & recommendation
  - Electrical Safety assessment & recommendation
  - Machine Safety assessment & recommendation
  - Identification and recommendation for occupational health
  - Evaluation of Fire fighting training & Drill

## **4. Methodology**

This safety audit can be conducted on Milk Vita, Mirpur. Section -7, Milk Vita road, Mirpur, Dhaka, Bangladesh. The Data Collection process can be done through primary sources (Face to Face interviews, Department wise Team meeting, and random sampling of the factory staffs) and physical observations of the factory premise and

finally all the activity are practice regularly in a large milk industry to produce quality ,hygienic and safety milk and milk products .

## 5. DATA ANALYSIS AND FINDINGS

### 5.1 Paraphernalia/Equipment

SL	Non Compliance	Action Plan	Comment/Recommendations
1.	Absent Sprinkler System	Installment of Sprinkler System covering the Pharma, binding and end product storage areas.	Only Firefighting equipment present fire extinguish
2.	Absent Smoke or Heat Detector	Installment of inter-zone smoke detector in all areas including raw material storage specially paint and lubricant storage.	NA
3.	Cold room Equipment	The entire employee use jacket with musk and gum boot to protect them.	World class equipment is available.
4.	Laboratory safety	For the safety of laboratory there is used high quality mask, apron and cap.	Sometimes may be mistakes but it's acceptable.
5.	No high quantity fire prevention instrument present(i.e. Water hydrant or water hose coil)	Installment of water hose for emergency fire fighting. Already there is a water hose of small quantity which is not sufficient for full coverage.	Even though it can be inconvenient for raw materials .It is recommended that at least two point to be installed as front and back point for water output.
6.	Secondary Equipment for chemical fire or chemical hazard which is not sufficient as per standard bench mark.	-Installment of Sand bucket( Minimum requirement) - Already have sufficient storage of Rubber Boot and gloves for chemical handling(As a safety measure)	Acceptable.
5.	About fire alarm	Installment of Fire Alarm for each zone including emergency lights.	NA

### 5.2. Job based Analysis

SL	Non Compliance	Action Plan	Comment/Recommendations
1.	Availability of Dedicated employee role & responsibility for emergency fire fighting.	Training and assigning dedicated employee for rescue, medical & fire fighting awareness among employees.	Regular Drill can be conducted.
2.	The employee role and responsibility for emergency escape assignment or schedule.	Training and assigning dedicated employee for rescue, medical & fire fighting awareness among employees.	Regular Drill can be conducted.
3.	Not presence of rescue and medical detail among employees in case of emergency.	Training and assigning dedicated employee for rescue, medical & fire fighting awareness among employees.	Regular Drill can be conducted.
4.	About emergency prevention plan	Should implement emergency prevention plan including: <ul style="list-style-type: none"> <li>• Major work place hazards</li> <li>• Personnel responsible for various emergency procedures</li> <li>• Regular training &amp; Drill on emergency.</li> </ul>	Implementation of Health & Safety committee can be formed.
5.	Emergency response procedure	Should implement emergency response plan including: i. Personnel responsible for various emergency procedures. ii. Regular training & drill on emergency procedures.	Application of Emergency response committee can be formed.
6.	Absences of proper First aid training	Conducting regular first aid training and designation of primary responsible for First Aid.	Highly experienced Training Manager (First Aid) can be appointed as contact basis, ASAP.

### 5.3. Location based Analysis:

Sl	Non Compliance	Action Plan	Comment/Recommendations
1.	Exit: gate are open always	Installation of “ <b>Outward Opening Door</b> ” will be optimum even though the gates are always open while operation goes on.	Three gate with shutters: One front, One back, One middle can be introduced.
2.	Kill paste	Modern equipment are available	NA
3.	Ventilation: there are big ventilation fan for proper air flow.	Need more cool places for quality products.	More or less upto the mark.
4.	Space: Placement of raw and output material.	Lots of modern cold room is present	NA
5.	Proper space for planning: Space is used way over the limit of optimal use, resulting congested space because of machineries.	Thinning out the machines and acquiring additional space for more spacious storage place.	It will reduce accident, free up space for emergency pathways and reduce heat.
6.	About separate place for chemicals.	There is a separate chemical place	NA
7.	Building integrity: about approval by concerned authority for building construction for this particular production facility. About occupancy certificate either.	All the programmed is more or less approved from authority.	High quality engineer are available there. .
8.	About environment clearance certificate.	Acquisition of environmental clearance certificate.	Day to day <b>ETP</b> monitoring and compliance with DoE.

### 5.4. PPE and Others:

SL	Non Compliance	Action Plan	Comment/Recommendations
1.	No accident/incident report is maintained, very few found(only)	Maintenance of chronological accident/incident register	NA
2.	Deviation report found but none consistently.	Should maintain as daily routine basis.	NA
3.	Insufficient of PPE(Personal protective equipment) not maintain up to the Mark	Implementation of regulation on all times usage of Rubber Gloves while handling chemicals and wearing Rubber boots while handling large quantities of it. Even though the sound level is not above tolerance, usage of noise reducing ear plug is preferable. Similarly, usage of metal gloves in cutting machine is advisable.	Employees should be made aware of the necessity of the personal protective equipment through regular training and implemented standard operating procedure (SOP).
4.	No sufficient backup light	Installment of More Backup light.	Several charge lights are used as instant back up light, backup generator line comes from outside supplier which supplies power for several lights only (No Generator for machines).
5.	No Safety cell/Committee or awareness activity	Formation of safety committee and conducting regular safety awareness campaign.	Regular training and drills will work greatly in this aspect.

### 5.5. Electrical Wiring:

Electrical connection, quality & placement of switch boards are barely satisfactory. Each machine has separate line & switch. Most lines are jacketed with plastic pipes and placed above head on the wall. There are some new electrical lines added outside of the jacketed lines which increases the fire risk even though they are bound the jacketed lines with twines or tape. There are no crises-crossings below the roof & no lines on the ground. Only placement of several pedestal revolving fan encroach on unsafe placement.

### 5.6. Machine Safety:

Machines are mostly safe with regular maintenance. The Heat producing machines has separate exhaust pipe to outside. Additionally some wall mounted revolving fans circulate the excess heat produced while in production. The possibility of work hazard includes cutting machine and various motors running in the press.

#### Provision of Safety:

- **Identifying the “Areas of Improvement” on Safety through Audit/Observation:**
- Risk/Hazard Assessment & Analysis on
- Equipment based analysis.
- Job based analysis.
- Location based analysis.
- Identifying the presence of the resources including “PPE” (Personal Protective Equipment) etc. & developing a useable PPE Matrix and recommending for immediate arrangement of the equipment to implement the Safety Management Program.
- Factory Premises including Factory Access, Weigh bridge area, roads, lanes & cleanliness related health hazard.
- **Preparing Accident Record Register in MS Excel: Must Provide an Excel Sheet and Online Information....**
- Factory Building Design Review & recommendation(subject to availability of the original building architectural layout plan in soft copy in AutoCAD only)
- Electrical “Safety Assessment & Correction” where possible as per recommendation of our Electrical Engineer.
- Machine Safety Assessment & recommendation
- Identification & recommendation for “Occupational Health”
- Working “Uniform/Dress”, Safe for work\_ awareness campaign among the first line workers.
- Recommendations for “Awareness Campaign Materials”.
- Formation of “Safety Cell” (Safety Committee) for self Inspection & carrying out safety events at a regular/scheduled interval.
- Giving Complete Guideline to establish an “Emergency Safety Clinic”.
- Formation of “First Aid Team”, One day “First Aid Training” by Qualified Medical Professional (On Additional Payment).
- **Fire protection Equipment & PPE :**
- Fire Fighting Training & Drill
- Formation of “Fire Safety Cell (Team)” & Preparing Yearly Fire Safety Drill Schedule(FSDS) :

### 6. List of Observation Documents

SL	Category	Observation
1.	Documentation	Boiler license
2.	Documentation	Boiler Operator license
3.	Documentation	Fire License
4.	Documentation	HVAC System permission
5.	Documentation	Previous Assessment Report
6.	Fire Protection Construction	Generator Room & Generator control room is not fire rated
7.	Fire Protection Construction	Uncovered light in the stored area
8.	Fire Protection Construction	Fire barriers are provided to separate boiler rooms.
9	Fire Protection Construction	Fire rated separations between Diesel tank and Generator are not found
10.	Electrical Substation establishment	Permission from Power Development Board.
11.	Means of Egress	Some of the Exit signs have no illumination system
12	Means of Egress	Insufficient emergency light
13.	Means of Egress	Day Care location

14.	Fire protection systems	Fire pumps accessibility
15.	Fire protection systems	Fire department connections are not provided
16.	Fire protection systems	Inspection, maintenance and testing records for hose pipe system not found.

## 7. Conclusion

Milkvita is a branded dairy industry in Bangladesh, no another one as like as Milkvita. The key idea is only a quality and safety products are produced by applying engineering technological assessment and systematic system safety management. As safety precaution equipment it has fire extinguishers, cold room protector which acts as the moderate fire and cold fighting unit. The chemical handling & storage situation is upto the mark. Ventilation scenario is acceptable. Electrical wiring is sufficient in terms of safety protocol with jacketed wiring and separate switch boards for the machines. Usages of space are available and meet up the requirement of milk industry. Moreover the findings and recommendations in section 5 can be introduced in the factory for better performance of the company.

## 8. Recommendations

Recommendations of safety issues have been mentioned in the section 5 of data analysis and findings. According to observation, the company can try to maintain up to the mark fire safety but one of the major problems there is lack of training to the entire employee. Employees are always doing to break the rules of safety about fire and others. It can be needed proper care from authority.

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