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RESEARCH ARTICLE

Emergency preparedness in a Dairy Industry

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Abstract

Emergency planning is an obligation in the aspect of prevention from industrial accidents that occur for any reason during the usage and production of hazardous materials, and natural disasters that affect the environment and community is affected negatively, and taking necessary precautions for minimization of their effects is a must. The facilities available in the plant and the state of emergency preparedness followed in the dairy industry is studied and analyzed first. After a complete study of the emergency preparedness followed in the dairy industry recommendations are given with an aim to improve the safety system and to incorporate the enhanced technology of emergency preparedness. An attempt to prepare Emergency Plan is done for the facility and the emergency steps to be taken for hazardous chemicals used in the dairy industry are done with the help of information provided in the material safety data sheet and also preparedness in case of fire, water supply interruptions, electrical supply interruptions, sewage backups etc. are suggested. The role of offsite emergency plan is cited for the dairy industry so that emergency preparedness is carried out well in a dairy industry without any problems and prevention of hazards and safety systems will be well enhanced if preparedness to meet emergency is well known.

1. INTRODUCTION

An emergency is an unusual incident/accident that has potential to cause serious injuries or loss of life. It may cause extensive damage to property, serious disruption both in production, working of industry and it may adversely affect the environment. It is essential for every industry to prepare an emergency action plan by identifying and assessment of risks to provide a safe environment. Monthly education and training program shall be given to workers to meet emergency situation. List of training activities that should be given to workers include Orientation and Education Sessions, Tabletop Exercises, Walkthrough Drill, Functional Drills, Evacuations Drill, Full scale Exercise. It is also necessary for an industry to have list of contact numbers of on-site and off-site persons who would be involved in responding to an emergency. A proper emergency plan for an industry involve clearly marked and placing of sign boards of evacuation routes and exits. The emergency plan laid out in an industry must be clear, easily understandable with a clear layout to prevent confusions and they must comply with legislative laws and regulations. The risks and improvements in the planning are identified by conducting of mock drill and by obtaining the feedback from the mock drill observations. The risk analysis and hazard analysis study carried out in an industry will be effective in framing an emergency plan and other indicators concerning health, environmental, social and economic factors are important for understanding the nature of the emergency and how it is likely to change over time, and for understanding how to react effectively.

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George M Rusch (1993) proposed the history and development of emergency response planning guidelines. The Emergency Response Planning guideline committee was formed to review a series of documents summarizing chemical toxicity which has been developed by a combined inter industry effort. This committee is a part of the American Industrial Hygiene Association and is composed of representatives from academia, government and industry, with background in industrial hygiene, medicine and toxicology since its founding, the committee has published 35 review documents containing recommendations for emergency exposure planning levels. Currently, the committee is working on another 25. Where chemicals are involved it is important to know the identity of the chemical; the toxicity of the chemical and the amount used or stored at the plant. It is also important to have an idea of the area that could be affected if the chemical is accidentally released, and to have an understanding of air flow patterns around the area. With this information local emergency response teams can make estimates of disperse in the event of catastrophic release and make appropriate plans for evacuation of the local community, if necessary. Much of this information should be well known to the plant safety personnel, especially current information on protective equipment, monitoring, respirator selection, and containment practices. There are many guides which offer recommendations for maximum permissible exposure levels for a variety of chemicals.

Kharbanda Om P and Ernest A (1989) established a planning for emergencies – lessons from the chemical industry. According to this proposal Safety, an area of crucial and overriding importance in industry, is a concept covering hazard identification, risk assessment and accident prevention. The problem of awareness of risk can be seen as one of the failure of communication and of miss-management. It is fundamental that for the avoidance of risk, the risk is highly subjective and has nothing to do with statistics. This introduces a communication gap which should be closed. Communication becomes crucial when planning for emergencies. This has two main areas of responsibilities: Planning within the plant or industrial complex, developed by the companies themselves, Emergency planning for the locality, developed by the authorities in co-operation with the manufacturers concerned.

Typical internal emergency planning arrangements are described and emergency plans for the community at large, and the need to be prepared for the unforeseen are discussed in the light of U.S Environmental Agency's Chemical Emergency preparedness plan. Preparedness for accidents has to be sustained: a constant, unremitting watch at all times. When an accident does occur, action must be swift, with instant reaction, to prevent the spread of damage. There is no time to look into or consider causes. Since the effect of an accident can be widespread, the communities in the locality need to know not only what to do, but also what is being done for their protection. Before undertaking any other work, steps should be taken to search out and review all existing emergency plans. The main reasons for reviewing these plans are: To minimize work efforts by building upon or modifying existing emergency planning and response information and, To ensure proper coordination with other related plans. To the extent possible, currently used plans should be amended to account for the special problems posed by hazardous materials, thereby avoiding redundant emergency plans. Even plans that are no longer used may provide a useful starting point. The main aim of emergency preparedness in an industry is to develop and apply new and existing methodologies and technologies to assist the management in responding to emergency situation and to respond well in case of such situations.

2. METHODOLOGY

This focus on the major emergency planning needed for an industry and establishing a management team that could assist the management to be well prepared for an emergency situation and easily tackling of those emergency situation by splitting into teams and handling the emergency situation. An emergency action plan must be designated in advance and the idea behind having such a plan prepared in advance is that it will be helpful to respond in a responsible and clear-headed way if an emergency occurs. The emergency planning also involves analyzing the hazardous chemical used in an industry and the effects that will occur on leakage or spillage or release of those hazardous gases and safety measures, first aid to be provided in case of such emergency situation must be planned well in advance by referring material safety data sheet (MSDS). To check the efficacy of the plan response time of rescue team, effectiveness of communication and team co-ordination mock drill must be conducted in an industry every month. It is essential for every industry to have safety system such as Emergency Siren, Eye & Body Washer, Manual Call Point, First Aid Box, Personal Protective Equipments, Fire Hydrant System, Fire Extinguisher System that will be helpful in emergency situation and the safety

system used in the industry must be upgraded with the latest technologies.

3. RESULT AND DISCUSSION

3.1 Mock Drill

Mock drill plays an important role in emergency preparedness steps. A mock drill is a method of practicing the evacuation of a building for a fire or other emergency. Generally, the emergency system (usually the fire alarm/smoke detector) sounds and the building is evacuated as though a real fire had occurred. It is a common practice to conduct mock drill in every industry. In the diary industry mock drill were conducted taking a situation such as if one of systems were failed and based on the mock drill observations, the appreciable points are noted and the points for improvement are suggested so that all are aware of the situation so that they don't commit the same mistakes that they committed during the mock drill practice and hence conducting a mock drill is helpful for everyone to be aware when such emergency situations occurs for real. The photos of mock drill give an idea of what has been done and we can note the proper procedure that must be followed from the photo observation. Mock drill should be carried out step by step as follows:

Step1: Test the effectiveness of communication system.
Step2: Test the speed of mobilization of the plant emergency teams.
Step3: Test the effectiveness of search, rescue and treatment of casualties.
Step4: Test emergency location, shut down and remedial location taken on the system.
Step5: Conduct a full rehearsal of all actions to be taken during emergency.

3.1.1 Sample Mock Drill Report

Objective

To check the efficacy of the plan response time of rescue team, effectiveness of communication and team co-ordination.

Assumed scenario

- Fire at Containers area.

I. Mock Drill Operation

A fire was noticed in the containers at 3.00 p.m., immediately it was informed to the Security gate asking to give emergency siren. Simultaneously they informed to the plant head about declaration of emergency. On hearing the siren and getting information over phone the team leaders along with their team assembled near main gate entrance which is the ECC (Emergency Control Centre) other non key persons were rushing to the assembly point.
On further direction from the concerned Heads all teams started functioning as per their role and responsibility.

1. Fire fighting team
Started fighting the fire by operating 3 fire hydrants at Containers.

2. Repair team:
Assisted to the fire hydrant team and safety team.

3. Transport team
Arranged Ambulance to shift the casualty.

4. Safety team
Supplied helmets and maintained the optimum pressure in the fire hydrant line by operating Diesel pump.

***5*. Medical team**
Attended the casualties by giving First Aid who met with an accident during fire fighting.

6. Evacuation team
Evacuating entire employees, visitors from the plant. Head count was done by the evacuation team. After the emergency is over which was confirmed by the plant head and declared normalcy at 3.15 p.m there by assembled persons at gate turned back to their work spot.

II Observations during mock drill

a) Appreciable points

- Ambulance put in service to shift the casualty
- Three Hydrant points were put in service at a time and the water pressure achieved above 20 feet height.
- Fire fighting Operation by security team found good.
- Team co ordination was excellent.
- Emergency Exit used by employees at powder plant during evacuation.
- First Aid issued to the causality before shifting the victim in to the Ambulance.

b) Points for Improvement

- Emergency siren was not operating at powder plant. So the communications were made only by oral among the workers. Emergency sirens at Powder and Ice cream plant are needed to be checked and make into work properly.

- Emergency Siren was not working at Ice cream plant too for declaring normalcy by giving continuous siren.
- The ambulance moved at 03.02 p.m and there was a small crowd assembling at the assembly point in the way of ambulance.
- Fire hydrant no.1 was not working properly. It has some problems with its gasket and opening valve.

At the end of the mock drill a meeting will be conducted with the team members and plant head to discuss the short comings and to improve the system further. Head count and mock evacuation also took place as a part of mock drill.

Mock Drill – Observer's Findings

Observer - I

03.00 p.m -The alarm was given. Ice Cream area sound was good but powder plant both siren not got operated. Thus No alarm sound in powder plant then over verbal communication staff started rushing to assembly point.

03.03 p.m - Plant was empty

03.03 p.m - The ambulance reached at fire spot

03.06 p.m - First water spray was started from Powder plant hygiene block.

03.07 p.m - Second spray

03.09 p.m - Third spray. Its nozzle came out with force but no injury, pressure was too high thus unable to handle the pressure controlled within 2 min. All the personnel moved towards the assembly point in mean time. All 10 containers got covered well by the hydrant spray. Medical team came and took the casualty in the ambulance by lifting.

03.08 p.m - Ambulance moved to hospital soon after first aid. Hydrant was got operated with self start facility. Water spray was very good almost @ 40 feet high.

Points to be addressed

After clearance of all mock drill activity All Clear siren not got operated finally everyone moved to their workplace after verbal communication.

Observer-II

Location: Fire Hydrant Pump House

3.00 p.m - The Alarm started

3.05 p.m - All the fire fighting team members reached the spot

3.06 p.m - First Fire hose used.

3.09 p.m - Last fire hose placed.

3.08 p.m - Fire Engine started.

Appreciable Points

- Over involvement and co operations of the fire fighting team was found excellent.
- All the three hoses reached above 15 m height which is highly appreciable.

Points to be addressed

- Water level in the Fire hydrant Sump is only 50 % at 3.10 p.m. Hence water level to be maintained above3/4 always.
- Vehicle No.6336 (Milk Tanker) Driver was inside the vehicle even after hearing the emergency siren. Proper training to be issued to Drivers/Contractors also. While fighting the fire using fire hose at F.H location 1 by the security the pressure gun was removed from the hose which may cause an accident to the fire fighting man.

Observer-III

Location: Assembly Point

03.00 pm - The alarm was given

03.02 pm - The ambulance moved from the main gate .All the personnel moved towards the assembly point.

03.12 pm - The head count verified and tallied.

Points to be addressed

- The ambulance moved at 03.02 p.m and there was a small crowd assembling at the assembly point in the way of ambulance. If the crowd was on higher side, the movement of ambulance would have been difficult.
- The alarm was not audible to the person sitting in the admin office.

Observer-IV

1. In Admin block - Accounts & audit section 2 persons & HR 1 person are there.
2. Inside ice-cream production area - Mix section 1 person, production 5 persons were there, all conveyors were in running condition
3. Canteen outside 1 person was there
4. Maintenance, electrical & refrigeration no persons are there but machines in running condition.
5. Inside Powder Plant 5 persons are there
6. Ghee, Butter packing sections no persons are there
7. All persons were rushing to assembly point and fire fighting team was working on the incident sight.

Table 3.1 Action plan for mock drill

S.No	Observation	Action pan	Responsibility	Target date	Status
1	Emergency Siren was not working properly at both DI & I/C plants	Emergency Siren to be checked	Electrical Dept	05/09/12	Completed Now Working at both plants
2	Fire hydrant 1 was not working well	Hydrant points need to be serviced	HSE dept	02/09/12	Service completed
3	No stretches has been used while attending casualties	Training to be given	HSE dept	10/09/12	Completed

3.2 Safety Systems

The safety systems to be followed in the dairy industry include Emergency Siren, Eye & Body Washer, Manual Call Point, First Aid Box Details, and Personal Protective Equipments, Fire Hydrant System, Fire Extinguisher System

3.2.1 Hand Siren

Hand siren can be placed at each and every location of the storage of hazardous material in the dairy industry. A siren is a loud noise making device. Fire sirens are often called "fire whistles", "fire alarms", and fire horns." Although there is no standard signaling of fire sirens, some utilize codes to inform firefighters of the location of the fire.

3.2.2 Fire Blanket

A fire blanket is a safety device designed to extinguish small incipient (starting) fires. It consists of a sheet of fire retardant material which is placed over a fire in order to smother it. In order for a fire to burn, all three elements of the fire triangle must be present: heat, fuel and oxygen. A fire blanket either completely surrounds a burning object or is placed over a burning object and sealed closely to a solid surface around the fire. Whether the blanket is placed on top, or surrounding it, the job of the blanket is to cut off the oxygen supply to the fire, thereby putting it out.

3.2.3 Smoke Escape Hood and Mask

The Smoke Escape Hood & Masks assist in escaping an emergency by protecting vision and filtering out harmful particulate which can cause choking, possibly leading to unconsciousness. The patented filter will filter out particulate matter as small as 0.45 microns (carbon, chemical, biological or any other particulate). The filter is made with a patented tri-layered, ionized construction-approved material, designed for respiratory protection against airborne particles. Smoke filtration is so effective that even tobacco smoke will not pass through the filter. Plus the filter offers low resistance to breathing oxygenated air.

3.2.4 Fire Sand Bucket

It is necessary to keep a fire sand bucket near every place of hazardous material storage, so that in case of fire, the fire can be easily extinguished with the help of fire sand bucket placed nearby and we need not go to other places seeking for extinguishing medium. This is the simplest and quickest way of putting off fire. It is recommended that a steel bucket is used. If a plastic bucket is used, it may crack, warp or melt. The bucket should be well labeled. The sand must also be cleaned of all flammable material. The sand must be completely dry or else the intense heat of the burning metal will quickly flash the moisture into steam, splattering the burning metal on surrounding material and on to the operator. Sand cannot reliably be used to extinguish burning magnesium, sodium, lithium or other strongly reducing metals. These metals have the ability to strip oxygen from the sand, resulting in an even more intense fire.

3.2.5 Fire Sprinkler

The major hazard in the dairy industry is ammonia and implementing fire sprinkler in the storage area of ammonia will be helpful in dissolving ammonia to form ammonium hydroxide in case of any leakage occurs. In buildings protected by fire sprinklers, over 99% of fires were controlled by fire sprinklers alone.

3.2.6 Fire Extinguisher Box

Instead of just hanging fire extinguisher at open place, fire extinguishers can be placed inside a box and hanged. The extinguisher boxes are light in weight, corrosion proof, sturdy and dust proof box and are designed to accommodate fire extinguisher bottle very safely and securely.

3.2.7 Fire Prevention

Prevention is always the first and most important action you can take to avoid loss of life and property. Fire prevention tips and guidelines exist within all communities and for all types of business operations, so it will be a better approach for improving safety by having the enhanced technology for preventing fire such as Fire Barrier Products, Arc flash Protection, Safety cans, Fire & Smoke Dampers, Ash & Waste Cans, Ventilation, Heat Resistant Materials, Safety Cabinets, Safety Signs, Electrical Protection.

3.3 Respond

Immediate response is essential to limiting injuries and loss. It must be make sure that plan has been clearly communicated to employees and tested. Communication plan must be activated to assure that all employees and visitors to the dairy industry are accounted for and make sure that First Responders have the critical information on the event and injured people. Emergency evacuation route, Escape ladders, Escape respirators, Glow-in-the dark marking, Defibrillators, Medicinal are some of the responding equipments to be used in case of emergency.

3.4 Posting Safety Signs

- Safety signs in the workplace should be mounted for optimum viewing.
- Signs should be placed in a manner so that they are legible, non-distracting, and non-hazardous in themselves.
- Signs must be conspicuously posted for review by workers or any personnel approaching the hazardous area.
- Posting safety signs in multiple languages will help ensure all of your employees are aware of the hazards that may be present.
- Where practical place signs approximately every 40 feet.
- In fenced areas, sign posting is only required at access points.
- Placing too many sign, too close together should be avoided.
- The quantity and placement of signs will depend on the extent of the hazards or the zone to be covered.
- Whenever possible use safety symbols that are simple and easy to learn and recognize.
- If safety symbols are being used they must be as simple as possible and should contain only essential details.

3.4.1 Safety Sign Recommended Viewing Distances

ANSI Z535-2007 standard uses a ratio of 25 ft of viewing distance per inch of text for Favorable Reading Conditions and a ratio of 12 ft of viewing distance per inch of text for Unfavorable Reading Conditions**.** Determining the safe viewing distance of a sign depends upon many factors: lighting, background, type font and visual acuity. Other factors to consider in determining sign size include: the complexity of the message, the reaction time necessary and the angle the sign will be seen from. In many situations it is better to use multiple smaller signs that are strategically positioned than one large sign.

Many times letter size may need to be larger than the values shown on the graphic for a variety of reasons:

- To make the sign more noticeable from other information displayed in the area.
- To enable legibility under low light, or other poor viewing conditions.
- To alert persons sooner than the minimum safe viewing distance.
- To convey special importance for portions of the message.
- To improve legibility for persons who have vision problems with small text.

3.5 Electrical Service Interruptions

Power outages are the most frequent type of manmade disasters. When losing electrical service:

- Consider access to an electrical generator to be used in emergencies. Make certain that the generator has the capacity to operate critical pieces of equipment such has refrigeration and freezer units, pumps, safety lighting, hot water heaters, etc. Make certain that individuals are trained to operate the equipment safely. Advise the utility company that you are using a generator as a safety precaution for their employees

- Consider securing access to a refrigerated truck that can be delivered to the site during an emergency.

- Consider securing access to a refrigerated warehouse that has a back-up generator to which dairy products needing refrigeration in insulted containers can be brought.

- Prepare an "emergency menu" in advance including recipes for dairy items that do not require cooking since the ventilation system will no longer remove smoke, steam, grease laden air, etc.

- Develop a plan for minimizing loss of dairy product held under refrigeration. Opening refrigeration equipment doors will cause the dairy items food to warm more quickly.

- Dry ice should not be used in enclosed spaces (i.e. walk-in cooler) because of the potential build-up of carbon dioxide.

- Heating, air conditioning, security systems, computers, cash registers, lighting, and other systems may not operate. Develop a plan for coping with these problems.

- Maintain contact information for people that can help you such as the utility company, garbage hauling service, ice supplier, refrigerated truck company, food warehouse, septic tank pumping service, local health department, emergency broadcast station frequency numbers, etc.

- Develop a list of equipment that uses electricity in your establishment and develop a contingency plan that describes what you would do if electrical service is interrupted. Use the Emergency Action Plans as a guide to help describe the steps that you would take in your own establishment.

- Develop a plan for communicating with key people in your organization. Keep a list of emergency contact numbers with you at all times.

    - Consider the purchase of a phone that plugs into a jack vs. one that depends on electricity for operation.

    - Plan how important documents and other information will be communicated without the use of computers and fax machines.

3.5.1 When Power is restored

Recovery involves the necessary steps for re-opening and returning to a normal safe operation. Key areas to consider for returning to normal operation when power is restored:

- Electricity, potable water, and/or gas services have been fully restored

- All circuit breakers have been properly re-set as needed.

- All equipment and facilities are operating properly including: lighting, refrigeration (back to operating temperature of 41° F and below), hot holding, ventilation, water supply, sewage pumps, hot water heaters, toilet facilities, ware washing machines and hand washing facilities.

- Food contact surfaces, equipment and utensils cleaned and sanitized prior to resuming food-handling operations. This includes ice bins in ice machines where ice has melted during the interruption.

- Flush all water lines, change filters, etc.

3.6 Water Supply Interruptions

- Prepare an "emergency menu" in advance including recipes for dairy items that require no water or minimal amounts of water to prepare.

- Maintain an inventory of single-service and single-use articles to help get through a reasonable time period.

- Maintain an inventory of bottled water.

- Maintain an inventory of containers suitable for hauling water.

- Maintain an inventory of disposable gloves and hand sanitizer.

- Develop a business agreement with a supplier of bottled water or a licensed drinking water hauler that will provide assurance that you will have an alternative source of water available during an emergency.

- Locate public water supplies in your area and points where containers can be filled with drinking water.
- Develop a contingency plan for toilets.
- Develop a business agreement with a supplier of ice in order to assure you that you will have access to ice during an emergency.
- Maintain contact information for people that can help you such as your plumber, water well drilling contractor, utility company, ice supplier, water supplier, fire department, local health department, emergency broadcast station frequency numbers, etc.
- Develop a list of equipment that uses water in your establishment and develop a contingency plan that describes what you would do if the water is either interrupted or contaminated. Use the Emergency Action Plans as a guide to help describe the steps that you would take in your own establishment.

3.7 Sewage Backups

- Develop a list of equipment and facilities that have a drain. Use the Emergency Action Plans as a guide to help describe the steps that you would take in your own establishment.
- Develop a contingency plan for toilets.
- Maintain contact information for people that can help you such as the plumber, drain cleaning service, utility company, septic tank pumping service, local health department, etc.

3.7.1 After sewage backup:

Recovery involves the necessary steps for re-opening and returning to a safe, normal operation. Determine the cause of the problem and take appropriate corrective action.

- In the case of plugged drain lines, the permit holder will:
  - Contact a service company to find and remove the obstruction.
  - Replace worn or damaged plumbing as needed.
- In case the onsite sewage disposal system is malfunctioning:
  - Contact the local health department for permit requirements.
  - Contact a sewage pumping contractor to pump the septic tank and haul away sewage to an approved disposal site until repairs can be made.
  - If necessary, barricade the affected area to keep the public and employees away from areas having exposed sewage.
  - Contact a sewage disposal system installation contractor to arrange for repairs to be made.

3.7.2 Personal Health and Safety Considerations for Employees Involved in clean-up

- Wear eye protection
- Wear rubber boots that can be washed and sanitized after the event
- Wear protective clothing such as coveralls
- Do not allow employees to walk between the affected area and other areas of the establishment without removing footwear and protective clothing
- Follow OSHA rules for handling detergents, sanitizers, and other chemicals used in the cleaning process
- Hand washing – Immediately after working with contaminated materials and before engaging in food preparation activities (working with exposed food, clean equipment and utensils, unwrapped single-service/use articles)
  - Double hand washing: Clean hands and exposed portions of the arms using a cleaning compound in a lavatory that is properly equipped by vigorously rubbing together the surfaces of their lathered hands and arms for at least 20 seconds and thoroughly rinsing with clean water. Repeat
  - Dry hands using disposable towels

- Use a disposable towel to turn off the water to prevent re-contaminating the hands
- Follow-up with a hand sanitizer
- Have janitorial staff clean the lavatory faucets and other portions of the lavatory after use to prevent transferring any contamination to food handlers.

3.8 Recommended Safety Technology for Diary Industry

3.8.1 Road Markings

Instead of drawing routes in paints for vehicles to pass and for people to walk in an industry, temporary road markings will be an efficient way that can be neatly laid and can be removed whenever necessary. With the help of high quality tape marking, the hazard due to poorly visible or even lacking road boundaries can be effectively reduced.

3.8.2 Artificial Resuscitator

Artificial resuscitator must be available in every dairy industry to provide oxygen to people in case of situation of difficulty to breath due to inhalation of toxic gases. While using artificial resuscitator place the bag and mask tightly on the patient's mouth, making sure at the same time that the neck and head are open enough for the airways to remain free. It is very important to practice the correct fitting of the mask on the mouth before using the bag.

The frequency for adults is approximately 12-15/minute and children 18- 20/minute. Press the bag with one hand and abruptly let go to let the expired air come out via the patient valve, listen for the air expiring at the valve and watch movement of the chest. Clear twisted airways or correct the position of head. Watch for spontaneous breathing. If this does not occur the patients airways or bag air valve may be blocked. Take immediate action by administering mouth to mouth resuscitation or clear the airways or obstruction. If the patient vomits, clear the airways by removing the vomit. Before re-using the respiration bag, squeeze bag several times. Cleaning of the valve by dismantling is not necessary during use.

3.8.3 Fire Extinguishing Ball

Fire Extinguishing Ball is a ball shaped fire extinguisher. Simply thrown into a fire, it will activate within 3-5 seconds and effectively disperse fire -extinguishing chemicals. When a fire occurs and no one is present, Fire Extinguishing Ball will self-activate when it comes into contact with fire and give a loud noise as a fire alarm. Because of this feature, it can be placed in any fire prone area such as above electrical circuit breaker. There is no special training or skill required to operate the ball and no need to face the dangers of the fire. No inspection and maintenance is required for the product life span of up to five year.

4. CONCLUSION

The plant visited is a dairy industry that involves the process of storing, using, producing and transporting of substances that are hazardous and toxic for living organisms and environment. For this reason, emergency planning is needed to minimize the effects of a potential emergency. Various journals are referred and study is carried on emergency planning followed in dairy industry and emergency planning to be adopted in that industry. Based on the findings in the dairy industry emergency steps and precautions to be taken in case of leakage or spillage of toxic chemicals and also preparedness in case of water supply interruptions, Electrical Service Interruptions, Sewage backups, Fires are suggested. Recommendations for the dairy industry given with the latest technology will be helpful in case of emergency situations. Implementation of these recommendations will be very helpful in meeting emergency situations and this report will definitely helpful to reduce accident rates in case of emergencies.

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