

**AUTOMATED FIRE CONTROL SYSTEM IN INDIAN TRAINS BY USING
SPRINKLER SYSTEM****Ponnam Gnana Teja¹****¹General Manager, Dept of Design and Innovation, Simtech Simulations, Hyderabad, T.S,
India****ABSTRACT:**

In the recent days fire accidents in Indian trains are becoming a massacre. There is a option of controlling and eliminating fire accidents within Indian Trains thus we came up with the solution. In the recent days, in commercial complexes for controlling of loss during fire accidents the system of Fire Control Sprinkler is introduced and this is automated by means of sensors. Because of this extreme change the novel era of safety measure is enhanced in the society on introduction of this system and the death rate of humans as well as damage rate of equipment is reduced a lot. Because of this enhancement we are attracted towards this system and thought to put into practice this system within trains. In our project automation of fire sprinkler system must be done.the design of the indian train wagon should be done and evaluated in the project

Keywords: Fire accidents, Fire Control Sprinkler, Indian trains, Fire sprinkler system, Automated, Humans.

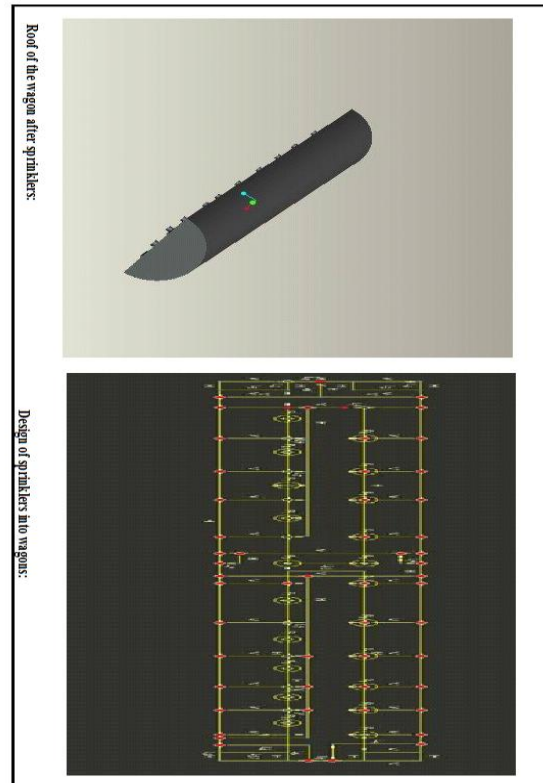
1. INTRODUCTION:

In the recent days, fire accidents within Indian railways are turning to be a massacre due to lack of safety measures to manage fire accidents. While the fire extinguishers

are introduced within railways they are not automated due to this and many wagons are set to fire accidents in the recent days [1]. In Railways because of lack of much space, material within trains like luggage and other fire catching products is most important

cause of fire accidents. In Railways because of lack of much space material within the trains like luggage and other fire catching products is most important cause of fire accidents. There is a opportunity of controlling fire accidents within Indian trains. Air is the most important factor during fire. When we control fire we require calculating velocity of air. During fire air must take most important role when firing air will act in response with fire and subsequently heavy ignition must takes place. Before attempting to recognize sprinklers it is helpful to have a fundamental knowledge of fire development and behavior. The role and interaction of fire sprinkler within protection procedure is better realized. In the past decade advancements made in technology connected with expansion of speedy trains has led to growing use of light-weight synthetic materials whose end-use performance might not be predicted by small-scale tests. Considerable research was conducted to build up quantitative methods to assess fire performance of complete system, starting with recent metrics for flammability of materials. The Fire Research Division has been involved within research

associated to passenger train fire security since the 1970's.



2. METHODOLOGY:

Smoke detectors are devices used to sense smoke and send opinion to the panel as well as to alarm. A smoke detector moreover known as smoke alarm detects smoke, normally as an indicator of fire. Commercial, industrial, as well as mass residential devices provides signal towards fire alarm system, whereas household detectors, normally issue local audible from detector itself. On the other hand, in numerous single families detached as well as

smaller multiple family housings, a smoke alarm is frequently powered simply through single disposable battery. A Fire Alarm Control Panel is controlling part of Fire Alarm System. The panel accepts data from environmental sensors considered to notice changes connected with fire, observes their operational integrity and offer for automatic control of equipment, and broadcast of information needed to prepare facility for fire based on predetermined sequence. The panel might moreover supply electrical energy to control any associated sensor, control, transmitter, or else relay. An automatic fire alarm scheme is designed to notice presence of fire by means of monitoring environmental changes connected with combustion [2]. Fire alarm systems notify people to empty in event of a fire or else other emergency, to ask for civil defense as fire brigades emergency services, and for sending of digital signals to connect systems interface to manage spreading of fire and smoke. In the fire event, the fire alarm control panel identifies which zone contains detector or else detectors in alarm, however it's not capable to recognize which individual detector is in an alarm state. Compression fittings are moreover used broadly for hot as well as cold water faucets

and toilet stop valves. Compression fittings are well matched to this application, since these valves are typically located in limited spaces in which copper pipe would be tricky to solder devoid of creating a fire hazard. Compression fittings are industry standard meant for chemical, oil as well as gas, Bio-tech, and semiconductor industry. They are used because of their capacity to offer leak-tight seals. There are two conventional types of compression fitting, standard as well as flare fittings. A valve is device that control or directs the flow of a fluid by means of opening, closing, or else partially obstructing a variety of passage ways. Valves are exactly valves fittings and in an open valve, fluid flows within a direction from high pressure towards low pressure. Valves might be operated manually, moreover by means of a handle, lever, pedal or else wheel. Tube bending is umbrella term intended for metal forming process used to permanently form pipes or else tubing [3]. One has to distinguish among form-bound as well as freeform-bending procedures, in addition to heat supported as well as cold forming procedures. A tube may be bent in several directions and angles. Water storage tank plays most important role for our project since throughout storage

of water will pass and flow varies from tank to tank thus we choose sintex tank. A water tank is for storing water. The requirement for water tank is as old as civilization, offering of storage of water in support of drinking water, fire suppression, agricultural farming, for plants as well as livestock, chemical manufacturing, food preparation in addition to numerous other applications.

3. ADVANTAGES OF PROPOSED SYSTEM:

In commercial complexes for controlling of loss during fire accidents the system of Fire Control Sprinkler is introduced and this is automated by means of sensors. In our project automation of fire sprinkler system must be done. The proposed system is used for instantaneous identification as well as control of a developing fire. Sprinkler systems act in response at all times, that includes periods of low occupancy. Instantaneous alert, in conjunction with construction of fire alarm system, automatic sprinkler systems will inform occupants as well as emergency response personnel of developing fire. Considerably less heat as well as smoke will be produced when fire is extinguished at initial stage. Improved life safety - Occupants are subjected to less

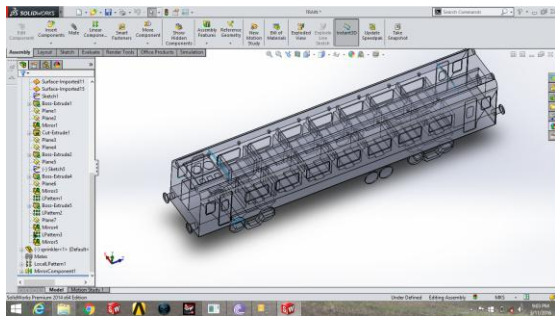
danger when fire growth is ensured. Design flexibility. When fire along with smoke barrier placement turn into less preventive since Initial fire control reduces demand on these systems. When a sprinkler controlled fire reduces demand on security forces, minimization of intrusion chances. Sprinkler controlled fires are less destructive than fires within non-sprinklered buildings. Insurance underwriters typically offer decreased premiums in sprinkler protected properties which saves a large of assets. However the disadvantages to be considered are: only thing we can consider of is water damage that might result while fire sprinkler is going off. This doesn't appear as bad when considering could lose literally the whole thing in a fire. Another drawback is the installation Cost that includes creation of a suitable source in support of water pressure and costs of periodic testing as well as Maintenance costs [4]. When the building is liable to freezing, there might also be costs connected with installing as well as maintaining of a dry system, or else provision of heat that would not otherwise be essential, driving up operating expenses.

4. TEST RESULTS

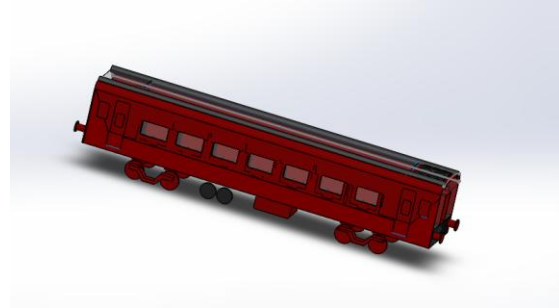
Design of the sprinkler system



The sprinkler proposition in train



Complete solid works model.



Pipe line

After building of prototype we stepped into testing procedure and got precise result and we controlled fire. Bottom of the train towards pump water is supplied from tank that consist at both ends of wagon, water capacity of each wagon is 2000lts and pipes associated to the pump is supportive to allocate water towards sprinklers at each instant when fire occurred at near of sprinkler, maximum temperature to be considered is 68°C and it automatically turns on.



After catching fire, sprinkler bulb will burst and subsequently it will work correctly.



And after that water will flow to control the fire



We got results precisely.

5. CONCLUSION:

In commercial complexes for controlling of loss during fire accidents the system of Fire Control Sprinkler is introduced and this is automated by means of sensors. We

conclude that by means of adopting system into Indian railway wagons we can control fire accidents and sprinklers can work efficiently by certain temperatures of 65°C. Hence in Indian climatic conditions it is preferred .By application of the above factors we can control fire and subsequently we can control lives. Sprinkler is superior system to which it can remove bulb that which spotlight the fire that which can control fire. Our work can be extended by means of usage of smoke detector panel as well as fire alarm.

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