

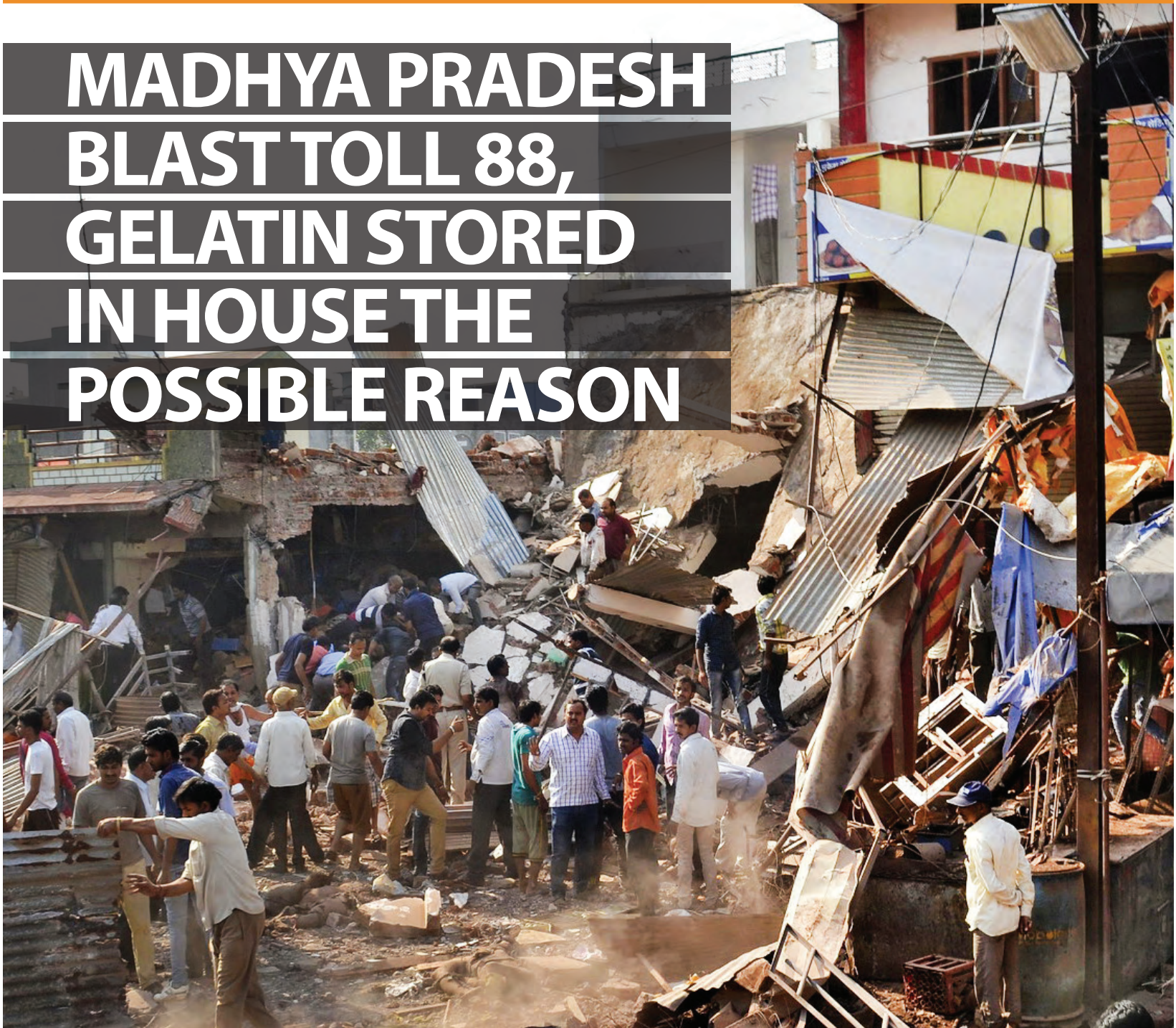
FIRE



TECH

A QUARTERLY JOURNAL ON FIRE SAFETY BY
NATIONAL ASSOCIATION OF FIRE OFFICERS

MADHYA PRADESH BLAST TOLL 88, GELATIN STORED IN HOUSE THE POSSIBLE REASON



PRACTICAL TIPS TO FIGHT
FIRES, SPILLS, LESSONS
LEARNT OUT OF LIVE FIRE
CASE STUDIES

**OIL & GAS SPILL
AND LEAKS,
OFFSITE FIRE FIGHTING**



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PRE-INCIDENT
PLANNING AND
TRAIN REGULARLY
FOR RESPONSES TO
THESE FACILITIES

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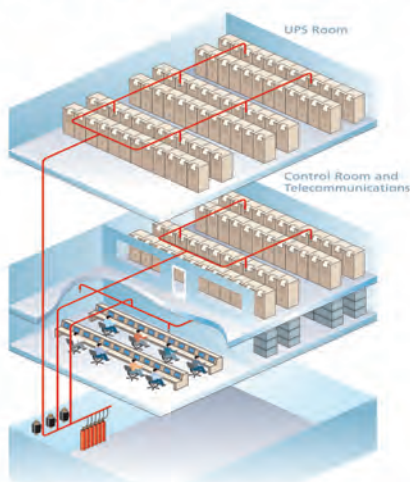
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HIGH RISE BUILDING SAFETY – CHALLENGES AND THE CHANGING TRENDS

WE LEARNT A LOT FROM PAST INCIDENTS AND AS A RESULT OF NUMBER OF EYE OPENER FIRE INCIDENTS, THE FIRE SAFETY ARRANGEMENTS, EMERGENCY EVACUATION AND PREPAREDNESS WERE GIVEN PRIORITY WHILE DEVELOPING A HIGH RISE STRUCTURE



CORROSION IS FOUND IN ALL SPRINKLER SYSTEMS AND IS ONE OF THE LEADING CAUSES OF MAINTENANCE AND OPERATION PROBLEMS

SPRINKLER PIPE CORROSION



THE DEADLY BLASTS IN TIANJIN AND APOLOGIES FROM LOCAL OFFICIALS IN THE NORTHERN PORT CITY

TIANJIN BLAST PUTS SPOTLIGHT ON CHEMICAL INDUSTRY



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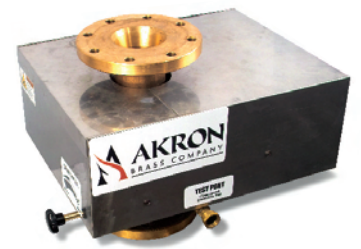
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FROM THE PRESIDENT'S DESK



★ M V DESHMUKH ★

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S S Warick (Gen Secretary)



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Y H Malu (Hon Secretary)

Dear Members,

The Fire Fraternity were dismayed by the sudden decision of the Government; the **National Fire Service College** was merged into the **National Disaster Management Response Force Academy. NAFO** validly submitted its representation, pointing out to the government as to how this decision is biased, exparte and not correct. A copy of the appeal was submitted to the Hon Prime Minister of India. Regrettably, a proforma letter whitewashing the issue, by the department, was received. (Our letter and the govt response are published in this issue for your perusal).

Firefighters across the country should unite / band together to salvage our Alma Mater. We have just seen this unity in action when Fire Officers joined hands to ensure a successful Kumbh Mela 2015; be it in Maharashtra or U.P.

We have some notable events covered in this edition :-

- **FPAI** has conducted several campaigns including providing financial support to bereaved families of firefighters.
- The **FSAI** did **Indian Fire & Safety Yatra (IFS2015)** in 11 Indian cities.
- The **FIRE INDIA 2015 Conference & Exhibition** in Delhi, and
- The **UL Seminar on Fire Safety in High-Rise Buildings**

It has been a hectic and trying time for Fire Services in India and overseas. There was a devastating dock explosion due to chemical storage in Tianjin, China killing over 175 and injuring over 600.

In Mumbai, we had a fire in a high rise building killing 7 persons and injuring 28. Once again, stressing the dire need for fire audits, mock evacuation drills and emphasis on Fire and Life Safety.

Amongst the interesting articles, we have Mr. Purushotam Singh, Fire Officer DLF Gurgaon writing about **High Rise Building Safety-Challenges and Changing Trends**; Mr. Kiran Hatyal, Sr. Instructor has written about **B.A. Sets** and their importance in a fire incident. Mr Sumit Khanna, Consultant FM Global has written about **Causes and Costs of Sprinkler Pipes Corrosion**.

Let's come together and join hands to drive **Mission Fire Safe Society**.

Kindly contribute your thoughts, experiences and knowledge to maintain **FIRETECH** to this global standard.

I welcome you to this issue.



NATIONAL ASSOCIATION OF FIRE OFFICERS

(REGISTRATION NO.: S-35438 OF 1999 UNDER SOCIETIES REGISTRATION ACT XXI OF 1860)

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NAFO is thankful to The Resource 24x7 for conceptualising and compiling this issue on an honorary basis.

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Eight people die in a Kurla restaurant fire

Eight people died in a fire tragedy that occurred at a restaurant called Hotel City Kinara, located near Kurla railway station on October 17, 2015. The victims were transported to Rajawadi Hospital and the bodies were charred beyond recognition. The accident happened due to a cylinder blast stored in the hotel.

City Kinara, a Chinese restaurant in Kurla West, like several others in the megalopolis served addictive Indian Chinese food, and had been running to a packed house despite glaring irregularities. The fire that broke out at the ground-plus-one eatery on Friday afternoon between 12.30 pm and 1 pm, and claimed eight young lives, was a tragedy waiting to happen. A number of illegal alterations had been made in the structure, it stored two gas cylinders on the mezzanine floor, and didn't have a single fire extinguisher fitted to battle an emergency. Residents from surrounding buildings spoke in whispers about flouting of rules, but none of them had taken the initiative to file a written complaint with the BMC.

Established in the 1960s, City Kinara changed hands about 10 years ago, when Sharad Tripathi took over its management. It gradually transformed into a ground-plus-one structure, becoming a popular snack joint for students of the nearby Don Bosco College, Vidyavihar. While the lower level housed two

tables alongside the kitchen, the upper floor held four. Two gas cylinders were also stored on the mezzanine, with pipes connecting them to the kitchen downstairs. Although initial reports oscillated between a short circuit and cylinder blast as causes for the fire, it was later revealed that a gas leak had led to the



tragedy. That the interiors featured wood, RCC and PoP, made the fire spread furiously while the unfortunate eight diners lay trapped.

A resident of a chawl that stands behind the restaurant, said he spotted a hand sticking out of one of the windows at the rear end of the mezzanine, flailing. It was one of those trapped asking for help. "Suddenly, the glass window shattered, and smoke bellowed out. It must have been just past 12.30 pm. I could see

someone's hand and hear screams. We quickly shut off the gas and electric supply at the chawl," he said.

Meanwhile, the civic authorities seemed to have been caught off guard, claiming they had little idea whether the establishment supported irregularities. "The restaurant itself was not illegal. But I am not sure how many cylinders were stored in there with necessary permissions. There might be other irregularities too, but they will have to be investigated," said Prashant Sapkale, assistant municipal commissioner, L Ward.

Assistant Commissioner of Police (Kurla division) Srirang Nadgauda, confirmed the gas leak. "Preliminary investigation has revealed that apart from having a main kitchen on the ground floor, the restaurant had a pantry on the mezzanine, which also supported a piped gas connection, apart from housing two spare cylinders. One of these was leaking and went unnoticed," he said. The waiter who was attending to the eight customers had stepped down at the fateful moment when the fire broke.

"Moments later, it is believed that the gas had spread across the mezzanine and suddenly, due to a short circuit in the wires, a fire engulfed the area. The false ceiling collapsed on the diners. They had no opportunity to escape. Everything was over within minutes," he added.

MAJOR FIRE BREAKS OUT AT WADALA PORT CITY

Exactly a week after Powai & Bandra fires, another major fire broke out in a refining plant's pipeline of an oil lubricant company at Wadala on the evening of June 13th, 2015. Thankfully no major casualty has been reported. More than 15 fire engines were rushed to the spot to control the fire. Fire brigade officials said that they received the distress call around 6.45 pm.

The refinery plant is situated in a non-residential area, but there are many buildings just over a kilometre away from where the fire incident took place. The fire disturbed the traffic movement in the area. The Wadala Eastern Freeway was closed due to safety concerns.

According to an official from disaster management cell of the BMC, the fire erupted outside the compound of Castrol oil company, where the leaked pipeline carrying petrol which belongs to BPCL (Bharat Petroleum Corporation Limited) is located. Fire started around 5.30 pm from the pipeline and thick black smoke soon covered the nearby areas. Nine fire engines, 6 jumbo tankers, and 3 ambulances were engaged in



the fire fighting and rescue operation. After the blaze increased the roads from Mahul BPT to Wadala and the Eastern Free Way were closed to avoid any accidents.

Deputy chief officer Pratap Rahangdale led the fire operation from the BMC fire brigade. A fire brigade official said, "We reached the spot at 6.30 pm as it was a Grade 2 call. The entire team stayed on the spot for the night to douse the fire and for other precautionary measures."

Fire on sets of Star Plus' TV show Tu Mera Hero!

The shoot of Star Plus' TV show Tu Mera Hero in Mumbai came to a halt on September 29, when a fire broke out on the sets. The accident took place at the Mira Road location of the TV show, and the sets were destroyed. Thankfully, none of the actors present were injured. But it is to be noted that this is the second fire on the sets of Tu Mera Hero.

Sonia Balani, one of the lead actors of the show said, "I heard a noise and I immediately went out to see what was going on. I could smell the smoke and see a lot of people around. By god's grace, no one was hurt and the fire was put out soon. The fire engines too arrived shortly. The entire bit halted our shoot for more than two hours after which we resumed our shoot." The fire broke out because the air conditioner duct got congested and the fibre caught fire, say reports.



TWO FIRE accidents in Coimbatore

Two major fire accidents were reported in Coimbatore city late on June 22nd, 2015. The first fire was reported at around 2:10 am near Sanganoor, officials said that four cars were charred in an automobile workshop and a furniture shop's property worth Rs 6 lakh was damaged in the fire. "The fire could have been either caused by an electric short circuit or a fuel fire. We are yet to ascertain the source and the point from which the fire broke out," said Thudiyalur police station officials.

The district home guards Karthik and Ponraj who were on their daily rounds at that time noticed the fire and informed the fire and rescue personnel. But before fire personnel reached the spot, nearly four cars were destroyed and the property in the furniture shop was also razed. There is a gas station located close by but luckily the fire did not spread to that side.

The second accident occurred in Cheran Maa Nagar, in which nearly 10 huts were destroyed. Since the huts had thatched roofs, all ten houses were destroyed in the fire. But no casualties were reported. One, S Lakshmi, 50, suffered minor burns on her hand and was admitted to Coimbatore Medical College and Hospital. Police said that families living in these huts were construction workers and had encroached upon the land.



60 shops gutted in Crawford Market fire

A major fire gutted more than 60 shops inside South Mumbai's iconic Crawford Market early on October 26. No casualties had been reported. The control room received its first alert regarding the fire at 5.19 am. Eleven fire tenders and eight water tankers were pressed into action and it took them about two hours to douse the fire. The fire is believed to have started from the fruit section of the market because of a possible short circuit and continued to spread to the interior of the market.

The shops mostly of perfumes and packaging material were gutted. The affected shops had a lot of packing material that caught fire. A number of aerosol cans were ignited and resulted in multiple small explosions, which further spread the fire.



MADHYA PRADESH BLAST TOLL 88, Gelatin stored in house the possible reason

At least 88 people were killed and another 70 injured when mining gelatin stored in a house near a busy bus stand in Petlawad town of Jhabua district exploded on 12th September, 2015. Police initially thought that a cooking gas cylinder in a restaurant exploded and set off a second blast in an adjoining house where gelatin had been stored. But a top official of Indian Oil Corporation said the distributor had issued only a single cylinder to the restaurant and it was found intact in pictures taken after the explosion. Police later said gelatin sticks kept in the house of one Rajendra Kumar Kaswa exploded, killing most of its occupants and those in the vicinity. The Madhya Pradesh Chief Minister Shivraj Singh Chouhan has ordered a judicial inquiry into the incident.

According to police, Kaswa had a licence to deal in explosives. What no official was able to explain why were mining explosives stored in such a busy area of town. Eye witnesses said the force of the explosion was so high that people were tossed in the air. DGP Surendra Singh of the area said the police were treating the incident as an accident. Ruling out foul play, he dismissed rumours that the explosion

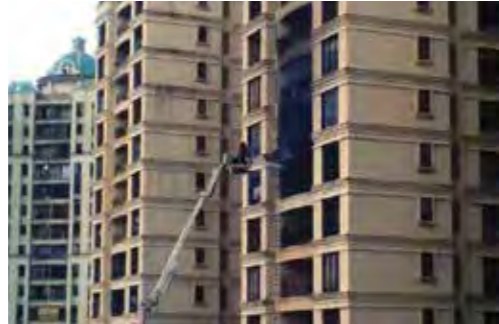
was the handiwork of SIMI activists.

The government said 76 bodies had been identified. Most of the dead were men. The dead included employees of the restaurant, customers who were having breakfast there, occupants of the house and passers-by. The intensity of the explosion was so high that it left nearby houses and shops damaged. The injured were rushed to hospitals in Ratlam, Indore and Jhabua. Rescue work continued till late in the evening because authorities suspected some people could be buried under the debris. Home Minister Babulal Gaur flew to the spot along with Chief Secretary Anthony d' Sa and other bureaucrats. Chief Minister Shivraj Singh Chouhan expressed grief over the incident and announced an ex-gratia of Rs 2 lakh each to the kin of the dead and Rs 50,000 for those injured.

Local residents alleged that they had recently complained to the sub-divisional magistrate when they came to know that explosives had been stored in the residential locality but the administration did not act. While police officers maintained that the house owner had a licence, they could not say whether he had permission to store them in his house.

MUMBAI FIRES LEAVE 7 DEAD, 28 INJURED

At least seven people died and 28 were injured in two major fires, one in a multi-storey building in suburban Powai, Chandivali area and the other at a Bandra slum on June 6th, 2015. Three weeks after the Kalbadevi fire, the city witnessed two fires in Bandra and Powai in one evening. The first fire broke out at 5.30 pm on the 14th floor of a 21-storeyed building - Lake Home Society on Chandivli Farm Road near Chandivli — and killed seven. Twenty-five were injured.



At 6 pm, another fire broke out in the slums near Bandra's Reclamation Road that left three people injured. The Bandra fire was doused by 7.30 pm and victims were rushed to Bhabha Hospital.

Eight fire engines and five water tankers were deployed on the spot. Of the seven dead, four bodies were found in the lift, one on the staircase and two in the corridor. Of the 25 injured, one was an assistant station officer, who has been admitted to Hiranandani Hospital with 23 others. One civilian was been sent to Airoli for treatment.

When the fire broke out, residents panicked and began to run in the corridors and some entered the lift. However, the

electric supply to the lifts was cut off, trapping five residents inside. The fire fighters pulled the residents out in an unconscious condition. The fire also left two fire officials from Andheri and Vikroli fire station — Assistant Station Fire Officers PN Pawar and Sonawane — injured. They were admitted to Hiranandani Hospital. Among the injured, a senior citizen was admitted to National Burns Centre at Airoli.

The fire officials claimed that they found it difficult to navigate inside the building as the staircase was blocked with goods.

Acting Chief Fire Officer, P Rahangdale said, "In this operation many people were



evacuated through the staircase by the fire fighters." This incidents are a haunting reminder of the fire that consumed Kalbadevi's Gokul Niwas building in South Mumbai on May 9, where four fire officers lost their lives fighting the blaze.

Blast at Sainor Life Sciences unit

Two workers, including a pharmacist, were charred to death and five others injured after a reactor blast rocked the active pharmaceutical ingredients manufacturing plant of Sainor Life Sciences Private Limited at the Ramky group's Jawaharlal Nehru Pharma city at Parawada, Visakhapatnam on September 29, 2015.

The deceased were identified as pharmacist Harish Kumar (29) of Srikakulam district and his helper Srinivas (50) of Kasimkota in Visakhapatnam district. However, their bodies could not be shifted from the accident spot till late at night as members of trade unions, people's representatives as well as the bereaved family members refused to do so till the government provided them with more ex-gratia as well as the assurance of a job for each family member.

The injured were identified as SK Noo-karaju, Gangadhar Rao, G Raju, E Shekar and B Kondal Rao. Four of the injured were admitted to RK Hospital in Gajuwaka, while Gangadhar Rao, who was said to be in a critical condition with 50% burns, had been admitted to Care Hospital in the city. Harish Kumar was a permanent employee of the unit while the other deceased worker and the in-

jured were contract employees.

According to sources, the accident took place at around 12.30 pm on the first floor of the Sainor Life Sciences plant, which makes APIs, pellets and intermediates. There are around 10 reactors on that floor.

The pharmacist and his helper were involved in making the API for anticid drug Omeprazole when the explosion took place, sources said, adding that Kumar and Srinivas were trapped in the area that went up in flames. The injured workers were also busy at work near the reactor, the sources said. An enquiry into the reactor blast has been initiated and the cause is yet to be ascertained. It was difficult for the factories department officials



to speak to the company management as the situation had become tense due to the agitation by family members and workers.

Meanwhile, eyewitnesses said that the blast was so severe that the wall on one side of the building collapsed completely and the entire building was engulfed in thick black smoke within minutes. Nearly six fire tenders that were pressed into service took almost two hours to douse the fire. The fire department was to register a case against the Sainor Life Sciences management for not obtaining the mandatory no-objection certificate from the department before commencing operations at the unit.

At least six major fire accidents have been reported at the JNPC city in the past couple of years. There are allegations that the managements of pharma companies have not ensured the adequate safety measures even after notices were issued by the district collector and other higher authorities. According to sources, the explosion took place at a time when officials from the factories department were busy making arrangements ahead of their meeting with chief minister N Chandrababu Naidu to discuss security measures in industries.

Auto catches fire, 2 charred to death

Two persons were charred to death after an auto-rickshaw caught fire following a head-on collision with a Maruti Zen at Ghaziabad on October 2nd, 2015. The accident happened on NH-58 near Duhai in Muradnagar around 1:30pm on Saturday.

The CNG auto-rickshaw was carrying two passengers when it met with the accident. Driver Sonu and 84-year-old Rajbati were killed, while her daughter Mala sustained burn injuries. According to eyewitnesses, the Zen was on the wrong side of the highway when it collided with the auto-rickshaw. While Mala managed to escape, Sonu and Rajbati could not free themselves from the mangled vehicle. The injured were rushed to MMG District Hospital in Sanjay Nagar. The Zen driver, who got his leg fractured, was taken to the same hospital.

Fire department officials claimed to have rushed a fire tender to the spot as soon as they received information at 1:59 pm. "A fire tender was in standby in Muradnagar for the panchayat polls. It was rushed to the spot. But two persons had been charred beyond recognition by the time the flames were doused. We suspect leakage from the gas cylinder of the auto-rickshaw caused the fire," said Akshay Ranjan Sharma, chief officer of Ghaziabad.

The body of Rajbati, a resident of Defence



Colony in Muradnagar, was identified by her daughter and her relatives, who had reached the spot after the accident.

"There were three persons in the auto-rickshaw. Driver Sonu and an elderly woman Rajbati were killed. Her daughter, Mala, escaped with burns and was stated to be out of danger. The bodies were sent to the mortuary. The driver of the Maruti Zen sustained a fracture in his leg. There were two other passengers in the Zen who also sustained injuries and were admitted to a private hospital," said DSP Anil Kumar Yadav.

Later on Saturday evening, a complaint was lodged by a passer-by, Ravinder, who saw the accident happen. Based upon this complaint, an FIR has been lodged at Mu-

radnagar police station under IPC sections 279 (rash driving), 304A (causing death by negligence) and 337 (causing hurt by act endangering life or personal safety of others) against the Zen driver. Sources said the Zen was being driven by a person identified as P K Agarwal, however, police refused to name the Zen driver or its occupants.

Firemen save 40,000 in Chennai rains

Firemen worked round the clock without sleep to provide rain affected people of Chennai as much relief as possible. Be it removing piles of debris or rescuing elderly people from marooned areas, they put in their best efforts. With more than 300 calls a day, relief teams were deployed all over the city and nearly 40,000 residents were rescued by fire services. "Ever since the rain began we chalked out a plan and in the past two days our men have been sent to nearly 28 places across the city to rescue stranded people," said Vijay Shekhar, Joint Director, Fire & Rescue Services, Tamil Nadu Fire. Areas where major rescue works were mounted were at Chromepet, Tambaram, TTC Nagar, Kishkinda Nagar, Kotturpuram, Villivakkam and SIDCO Nagar.



Diesel tanker-goods vehicle accident kill 14 in Karnataka

Accident between a diesel tanker and goods vehicle killed atleast 14 people on September 19, 2015 in Karnataka's Belagavi-Raichur State Highway. Six people were admitted to the hospital with serious injuries. The accident occurred in Mudhol taluka. The diesel tanker was going to Vijayapura while the goods lorry carrying people was heading towards Gadanahatti village. 10 people died on the spot when the accident occurred.

The Fire and Emergency Services per-

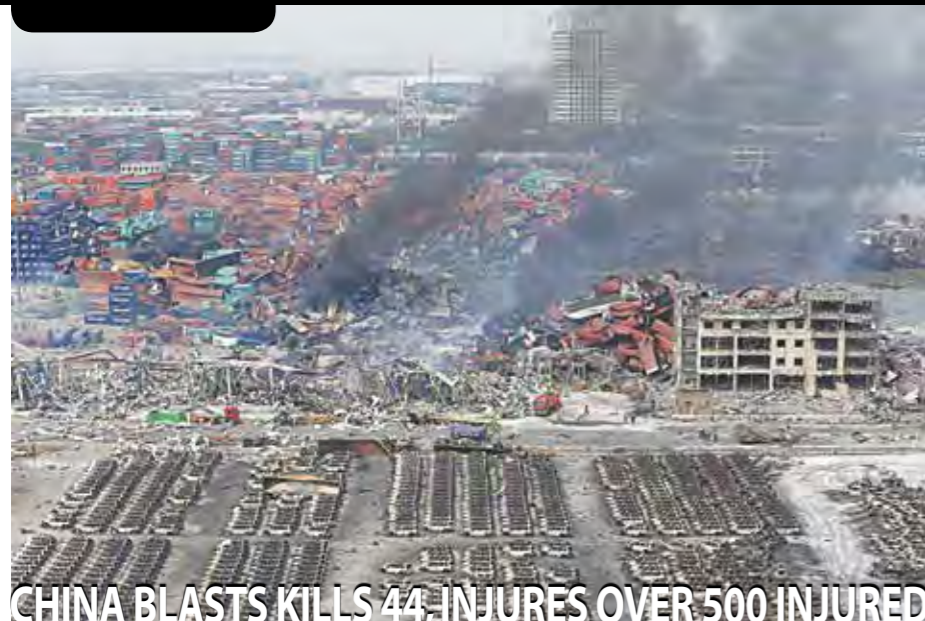
sonnel rushed to ensure that the diesel tanker didn't catch fire. The driver of the diesel tanker was not injured and he escaped from the accident scene apparently. The diesel tanker belonged to Basanagouda Nadagouda of Vijayapura.

The goods vehicle was completely destroyed in the accident. People from the villages of the victims gathered at the accident spot as soon as it happened. The police have registered a case. The victims were shifted to Lokapur government hospital.

Massive fire breaks out at Gurgaon furniture market



A massive fire broke out at Gurgaon's Sikanderpur furniture market on October 4, 2015, damaging around 50 stores. The market burnt to ashes. According to several reports, the fire that broke out due to short circuit, later resulted into explosion of about a dozen cylinders. It took about four hours for the team of fire brigade to be able to control it. The accident is estimated to have damaged properties worth crore of rupees. No information had been confirmed by the officials so far.



CHINA BLASTS KILLS 44, INJURES OVER 500 INJURED

In two massive explosions that ripped through a warehouse in China's port city of Tianjin on August 13, 2015, at least 44 people were killed and over 500 injured. The fire destroyed hundreds of cars and shattered window panes as huge flames leaped into the night sky. Amongst the dead were also 12 fire-fighters in the warehouse fire that stored dangerous goods. The first explosion occurred at 11.30 p.m. and was followed by a second more powerful blast, seconds later. A total of 520 people were hospitalized, including 66 who were critically injured, rescuers said.

Tianjin is located about half an hour from Beijing by train and is home to 14.72 million people. A resident, Zhang, who lives a 10-minute-drive from the site, said the blast made the night sky as bright as it was in the daytime. A video clip of a witness showed that the heavy smoke covered the sky, and shortly after fires raged. There were loud bangs. Another person, a truck driver, Hu Xiaoliang, 32, woke up due to an ear-shattering blast which threw him away from beneath his truck, where he and his co-workers were resting.

"It was all black and smog, I could not see anything inside. Some of my colleagues had even worse injuries," an injured fire-fighter in his 20s said.

Smog billowed from the site. In a nearby

apartment complex, the balconies of many apartment buildings were shattered. Du Wenjun never imagined that he would see a "mushroom cloud" outside the window of his home. Zhao Lirong, a 35-year-old businesswoman, was asleep when the blast blew off the windows and doors of her apartment, hitting her head, her son's neck and her husband's feet. Blood stains were splattered on the floors of hospitals that received injured patients. People rushed into the streets in their pyjamas, and some worried that an earthquake could occur.

The authorities have vowed to spare no efforts to investigate the accident, to treat the injured and search for the missing. Hundreds of fire-fighters struggled to contain the flames. Around 1,000 fire-fighters and 143 fire engines were rushed to the warehouse. The volatility of the goods meant the fire was unpredictable and dangerous to approach. At least 200 armed police officers were deployed at the warehouse.

China also shut down supercomputer Tianhe-1A, which can perform 2.57 quadrillion computing operations per second, due to the blasts. Tianhe-1A is located at the National Supercomputing Centre in Tianjin. The shockwaves due to the blasts shattered windows at the centre and led to the collapse of ceilings inside the building, according to the centre's staff.

Separate fire incidents in Egypt prove devastating

Fire accidents are common in Egypt, given the dilapidated condition of buildings and failure to adhere to norms. A deadly fire occurred at the furniture factory east of Cairo on July 26, 2015 killing at least 25 people and injuring 24 others. Egyptian state-run media said the factory had not obtained a government safety certification. The three-storey

furniture factory is situated on the outskirts of the Egyptian capital.

The fire swept through the factory and its warehouse after a gas cylinder exploded, security officials said.

Some of the badly injured died before ambulances could reach hospitals.

In another fire incident, at least 11 people were injured at a large supermarket

Coal mine fire kills 21 in China

At least 21 people died in a fire at a mine operated by northeast China's biggest state-owned coal company on November 20, the latest accident in the country's trouble-plagued resources sector. The fire broke out late Friday evening at a mine operated by state giant Longmay Mining Holding Group in Heilongjiang province's Jixi city. Longmay is the biggest coal firm in northeast China, but has struggled with financial difficulties, Xinhua said. The Xinghua mine, where the accident occurred, is located close to the border with Russia. Rescue workers had already found the bodies of 21 miners and were searching for one other missing person.

A total of 38 miners were underground



when the fire broke out and 16 managed to escape. The fire originated with a long conveyor belt used to carry materials which was set at a steep angle. The precise cause of the fire was under investigation.

China is the world's largest producer of coal and is grappling to improve standards in the poorly regulated sector. Many accidents are caused by corrupt bosses seeking profits over worker safety. Accidents in Chinese coal mines killed 931 people last year, a top work safety official said in March.

In July, rescuers pulled six men from a flooded coal mine in Heilongjiang after they survived a week underground following an accident that killed at least four others. In a separate incident, 11 miners who were trapped in a coal mine in the southwestern province of Yunnan after a "cave-in" were brought to safety in July after nearly two days of rescue efforts.

A British Airways flight caught fire on the runway at the Las Vegas airport on September 9th, 2015, sending 13 people to local hospitals for treatment. A majority of the injuries came as passengers slid down the inflatable chutes to evacuate the Boeing 777, Clark County Fire Department Deputy Chief Jon Klassen said.

The incident occurred shortly after 4 p.m. (7 p.m. ET) and involved British Airways Flight 2276, which was bound for London's Gatwick Airport, according to the McCarran International Airport's Twitter feed.

Passenger Jay Jennings, who was one of the injured, said it was "pretty scary stuff. The plane was getting ready to take off, he said, when he heard a big thud. He lifted the window shade and saw the trouble.

"Just saw flames on the engine," he said. The plane stopped and sat for what felt like a minute, he said. Then the captain came on the intercom and told the passengers there was an emergency and they needed to evacuate. When one of the emergency doors opened, smoke poured in. "Not safe, not safe," someone said, Jennings recalled.

Flight attendants directed passengers to safety, he said. Also on boards was Jacob Steinberg. "A few had cuts and bruises from the slide down. They were bandaged up," he said on Twitter. "One young woman was taken away by paramedics, but looked OK."

The Federal Aviation Administration said the aircraft's left engine caught fire, prompting the crew to abort the take-off. The flight had 159 passengers and 13 crew members aboard.

Photos at one point showed large plumes of black smoke engulfing the aircraft. That's what Bradley Hampton saw from the plane he was on, about 200 to 300 yards away. He said that he didn't know whether any passengers were on the British Airways jet -- until "all of a sudden, we saw the doors fly open and the slides inflate. At that time, we saw droves of people jumping out of a slide and running across the runway away from the plane."

One of the passengers evacuating was Jacob Steinberg, a sports writer with the Guardian newspaper in the United Kingdom.



He tweeted that a few people had cuts or bruises from the emergency slide. He also said people shouldn't criticize passengers who took their carry-on luggage with them during the evacuation.

Paul Berberian, who had just landed on a flight from Denver, expressed admiration at how quickly everyone moved. "It was like seconds, it was incredibly efficient. As soon as the slides popped, five seconds later people were just flying down ... and running away."

Berberian estimated that small vehicles were on site within about 90 seconds and larger fire trucks within two minutes. The airport tweeted that the fire was out and all passengers were off the plane by 4:18 p.m. - just five minutes after the first call came in.

"Three large fire trucks, they were just dousing that side of the aircraft with water to put out the fire," Berberian said. "It was very quick."

Hampton said that his own plane, as well as others, "were completely at a standstill" for some time as the situation played out. The incident spurred McCarran to close one of its runways, the airport added. Aerial

video showed the aircraft on the tarmac, with fire trucks nearby and several slides coming out of the plane that passengers used to exit and board buses that took them to the terminal.

Authorities didn't immediately say what caused the 777's left engine to catch fire. Two FAA inspectors were on the scene within about an hour after the incident ended, agency spokesman Ian Gregor said.

"Safety is always our priority," British Airways spokeswoman Caroline Titmuss said. "We are looking after customers after an incident involving Flight BA2276."

CNN aviation analyst and 777 captain Les Abend said pilots pull a "fire handle" under such circumstances. It deploys fire retardant to the specified area, cuts the hydraulics and electrical systems to the engine and shuts off the air system in the cabin. That means it was unlikely smoke was getting in the cabin until the emergency doors were opened.

Abend said crews practice evacuating their airplanes frequently with the goal of having everyone out in 90 seconds. The driver does not currently face any charges, Reyna said.

Vehicle collision kills kids, pregnant woman

Two adults and two children were killed on the morning of October 5, 2015 when a tractor-trailer collided with an SUV and both burst into flames. The crash was reported about 6:35 a.m. on the flyover ramp from westbound Interstate 20 to southbound I-35E, near Dallas, USA. The impact ruptured the 18-wheeler's gas tanks, and both vehicles caught fire, Sheriff's spokesman Raul Reyna said.

Two adults, including a pregnant woman, and two children in the SUV were killed in the crash, Reyna said. Their names and ages were not released. The truck driver was unhurt. The



big rig was carrying a load of lumber, and much of the burning wood fell more than 50 feet onto a grassy area and the shoulder of I-35E below.

Authorities had to shut down both highways in all directions. Four hours after the crash authorities reopened almost all lanes, and by 4 p.m. the ramp connecting westbound I-20 to southbound I-35E reopened, after it was determined safe. Reyna said the crash remains under investigation, and it has yet to be determined whether the SUV was stalled on the ramp or if the 18-wheeler was having mechanical problems before the collision.

FIRE ERUPTS AT MEXICO'S BIGGEST OIL REFINERY, SOME HURT

A fire broke out at Mexico's biggest oil refinery on November 24 at Pemex, Mexico's largest state run company. In the latest in a string of incidents to hit the company's refineries, the Red Cross said nine people were injured, while Pemex said eight people suffered minor injuries and were being treated.

A Pemex spokesman said the fire had been controlled and that the refinery, which supplies fuel for the domestic market, was operating normally except for an alkylation unit. The refinery has the capacity to process 330,000 barrels per day.

Photographs taken by emergency services workers showed a blazing fireball and a thick black plume of smoke rising up into the sky from the facility located in the city of Salina Cruz in the southern state of Oaxaca.

Luis Velazquez, a civil protection agency official in Oaxaca, said that nearby schools had been evacuated and that local hospitals were on red alert to treat any injured. "This is a highly populated zone," he said.

Pemex said last week it had reduced its annual accident rate last year by more than 33 per cent. However, a Reuters investigation earlier this year found that Pemex was reducing its accident rate by including hours worked by office staff in its calculations.

The key international indicator for measuring worker safety is the so-called lost time injury frequency (LTIF). Pemex says its LTIF decreased by about 88 per cent in 2014 from 2013, falling from 3.14 to 0.37 injuries and fatalities per million man hours, according to data released in July

by the International Association of Oil and Gas producers (IOGP).

That rate fell markedly because Pemex reported an additional 330 million man hours worked in 2014 - an almost seven-fold increase from the year earlier - even as its production decreased for the tenth year in a row.

There have been a series of fires at Pemex installations including refineries and oil platforms this year alone, which come as Mexico seeks to lure private investors to revive its flagging oil industry.

Accidents have plagued Pemex for years. In 2013, at least 37 people were killed by a blast at Pemex's Mexico City headquarters, and another 26 people died in a fire at a Pemex natural gas facility in northern Mexico in September 2012.

Two die in Gold Coast industrial accidents

An oil recycling plant worker and a contract maintenance worker have died in separate industrial accidents on the Gold Coast. At Yatala on the city's northern edge, a 38-year-old died following an explosion and fire at the premises of Oil Tech International. The man and two others were pouring oil sludge from a truck into a holding tank on November 4 when it ignited and exploded in what firefighters called an "intense" blaze.

The two other workers were unable to save their colleague but earned praise for their quick actions to bring the blaze under control. "The actions of the employees here contributed significantly to reducing what could potentially have been an even worse situation," Queensland Fire Service acting chief superintendent David Herman said.

"They went into action to remove the fuel that was being unloaded and to secure the area, to stop it escalating from where it was."

In the other accident, a 29-year-old man died when he fell approximately 20 metres while cleaning air-conditioning ducts in the main arena of the Gold Coast Convention and Exhibition Centre.

Police said the man, who came from overseas, was an experienced abseiler who was working as part of a contracted team for a Gold Coast-based abseiling company. He was wearing a full abseiling kit including a safety harness when he fell. "He was quite experienced with abseiling and he's been doing that for quite some time," Senior Sergeant Angeliqe Maloney told reporters. People inside the centre attempted to resuscitate the man but he died at the scene.

Fire at Saudi residential complex kills 11, injures more than 200

Civil defence officials in the kingdom said a large fire in the basement of a sprawling residential complex in Saudi Arabia's oil-rich east killed at least seven people and injured more than 200 on August 30. Arab News, citing Saudi civil defence officials, said the injured were of "various nationalities" and that some were in critical condition. A preliminary investigation showed the fire started in the basement of a building at the Radium compound rented by energy giant Saudi Aramco.

"Cars and furniture caught fire in the basement of one of the towers, heavy smoke billowed, obstructing rescue and firefighting operations," the Saudi Civil Defence Ministry tweeted.

Local engineer Mohammed Siddique told the Associated Press he saw smoke coming from the complex around 6 a.m. Soon emergency crews were battling an immense blaze. "I saw at least 30 ambulances and three helicopter," Siddique said. "The smoke was very heavy."

Residents of nearby buildings were evacuated, with helicopters rescuing those who fled to rooftops. The Radium Residential Complex is a gated community consisting of eight, six-story buildings with 486 apartments. It also contains shops, gyms and a movie theater and other amenities.

Saudi Aramco is the state-owned petroleum and natural gas company based in Dhahran. Aramco, which employs more than 60,000 workers in 77 countries, is the



world's largest oil company in terms of crude production and exports.

"We are deeply saddened to learn of the fatalities and injuries which resulted from the fire," the company's acting president and CEO Amin Nasser said in a statement. "We offer our heartfelt condolences to the families of the deceased." He said evacuated residents have been relocated to other residential communities.

Khobar is a city of about one million people in Saudi's Eastern Province. In 1996, a truck bomb attack at a U.S. Air Force dormitory at Khobar Towers killed 19 Americans and injured hundreds more. Last week, authorities announced an arrest in that bombing. Ahmed al-Mughassil was captured in Lebanon and turned over to the Saudi Kingdom. U.S. officials have linked him to the Saudi Hezbollah group.



Shoreham Air Show Disaster kill 11

On 22 August 2015, a vintage jet aircraft crashed during a display at the Shoreham Air show at Shoreham Airport, England, killing 11 people and injuring 16 others. It was the deadliest air show accident in the United Kingdom since the 1952 Farnborough air show crash, which killed 31 people.

The aircraft, a Hawker Hunter T7, failed to complete a loop manoeuvre and crashed onto vehicles on the A27 trunk road. The pilot survived the crash, and was placed in a medically-induced coma. As a result of the accident, all civilian-registered Hawker Hunter aircraft in the United Kingdom were grounded, and restrictions were put in place on civilian vintage jet aircraft displays over land, limiting them to flypasts and banning high energy aerobatic manoeuvres.

The aircraft was a vintage two-seat Hawker Hunter T7, registration G-BXFI, serial 41H-670815, displaying its former military serial number WV372 as part of its livery. Having first flown for the Royal Air Force (RAF) in July 1955, it was rebuilt following a fire, returning to service in 1959 after conversion to T7 specification. It had been making civilian display flights as a war bird since 1998, under a variety of owners. At the time of the incident, it was owned by Graham Peacock, and based at North Weald Airfield, Essex. The aircraft had flown to Shoreham from North Weald and was scheduled to return there after the display.

Andy Hill, the 51-year-old pilot, was described by colleagues as experienced, with more than 12,000 flight hours. He had



worked as a captain at British Airways. He had flown Harrier Jump Jets and worked as an instructor for the RAF before joining the airline. As well as the Hawker Hunter, he flew a Van's Aircraft RV-8 and a BAC Jet Provost at air shows.

The aircraft was taking part in the first day of the two-day Shoreham air show, held in aid of the Royal Air Forces Association. The conditions were hot and sunny, but with a crosswind up to 15 knots, described as not unusual for Shoreham by the local media. The Hunter had been opening the afternoon session of displays; the morning programme up to 12:30 BST (11:30 UTC) had already featured The Blades aerobatic team (opening), Justyn Gorman Aerobatics, an Auto Gyro Calidus, the Tiger 9 Aeronautical Display Team (six aircraft only), a Pitts Special, The Twister aerobatic team (one plane only), an RAF Tutor, and the RAF Falcons parachute display team.

The Hunter commenced its display with a low pass along the runway from south to north, turning for a second pass in the opposite direction. As it neared the airport, it pulled up into an inside loop. This manoeuvre started from a height of just 200 metres which David Learmount later said "left no room for misjudgement." Before it could complete the loop, the aircraft crashed in a nose-high attitude onto the west-bound carriageway of the A27 road. The aircraft broke into four parts on impact: cockpit, tail, left wing and main body, and right wing, destroying several cars in the process. Fuel escaping from the fuel tanks ignited in a large fireball and plume of smoke immediately following the impact.

Eleven people on the ground were killed and 16 others were injured. Those confirmed dead included two players from Worthing United F.C., a level 9 team in English football.

Eight vehicles were destroyed in the crash, including a Daimler DS420 limousine which was en route to collect a bride to transport her to church for her wedding. The driver of the Daimler was subsequently confirmed as one of the victims.

Hill, the pilot, was thrown clear of the aircraft in his ejection seat, which was live when the aircraft departed from North Weald. He survived the crash with serious injuries. He was flown to the Royal Sussex County Hospital in nearby Brighton; his condition was described as critical and he was said to be fighting for his life. He was subsequently placed in a medically-induced coma.

Following the crash, the A27 was closed in both directions, stranding those attending the air show. People were initially only able to leave the site on foot as the main access from the car parks to the A27 was closed. A West Sussex Fire & Rescue Service appliance was first on scene, closely followed by the airport emergency vehicles. It was announced the same day that the second day of the air show on 23 August was cancelled. [25] The A27 reopened on 30 August 2015.

The Air Accidents Investigation Branch (AAIB), responsible for investigating civil aviation incidents in the United Kingdom, sent a team to Shoreham. As a part of the investigation, the AAIB appealed for members of the public to contact them if they had photographs or video of the incident and received a large number of such recordings from a variety of locations around the airport. The aircraft was not equipped with a cockpit voice recorder or a flight data recorder. The AAIB published an interim report on 4 September. The report stated that "To date, no abnormal indications have been identified."

Corrosion is found in all sprinkler systems and is one of the leading causes of maintenance and operation problems for fire protection systems.

THE CAUSES AND COST OF SPRINKLER PIPE CORROSION



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CORROSION INCREASES THE LIFECYCLE COSTS OF FIRE PROTECTION SYSTEMS AND CAN BECOME A SIGNIFICANT ISSUE FOR SOME OWNERS OF WATER-BASED SYSTEMS.

Corrosion damage and mineral deposits can cause pipe leakage, restrict water flow to sprinklers and impair mechanical operation of fire protection equipment, leaving otherwise protected facilities vulnerable to uncontrolled fire loss.

Several organizations, such as the National Fire Protection Association (NFPA), the Electric Power Research Institute (EPRI), FM Global and the European Fire Sprinkler Network (EFSN), have published documents and standards attempting to address the corrosion issue. Currently though, there is no widely accepted strategy either within the fire protection industry or the National Association of Corrosion Engineers (NACE International) to effectively mitigate these types of problems in fire protection systems.

WHAT IS CORROSION?

Corrosion involves the reaction between a metal or alloy and its environment. It is an irreversible interfacial process, which causes the gradual deterioration of metal surface by water, moisture or other corrosive chemicals.

While metal corrosion can have many different causes, it is generally characterized as having different forms or types based on various physical characteristics. This study specifically focused on corrosion issues in fire protection systems. Some fire protection systems are more susceptible to certain forms of corro-

sion and some types of corrosion, or a combination of types, are more likely to cause leaks or system malfunctions.

CORROSION IN FIRE PROTECTION SYSTEMS

Corrosion increases the lifecycle costs of fire protection systems and can become a significant issue for some owners of water-based systems. It can cause leaks that will reduce the amount of water available if the system is activated and can affect components like sprinklers, making them inoperable.

Corrosion can also cause tuberculation, the buildup of mineral deposits in the system's pipes. These knoblike mounds are frequently observed in steel and galvanized steel pipe, and are capable of obstructing water flow in pipes and/or plugging sprinklers.

The most common causes of these types of

corrosion in fire protection systems are pipe weld corrosion, residual water in dry pipe systems and trapped air in wet pipe systems. Other frequent causes are corrosive water chemistry, oxygen injections into the system (fresh water recharged during regular maintenance), stagnant water, dead legs of pipe and microbiologically influenced corrosion (metabolic activities of microorganisms such as bacteria, fungi and algae).

PIPE WELD CORROSION

Corrosion of the weld seam is common for an electric-resistant welded steel pipe. This kind of damage may be attributed to the formation of unstable iron sulfides, along with high residual stresses and microstructure changes around weld seam areas. Such areas are created during the pipe manufacturing process and occur along the weld seam and other heat affected zones.

The use of stress-relieved steel pipes (Grade B in accordance with ASTM A795/A795M-13) can be beneficial in reducing weld seam corrosion. But the most effective way to mitigate weld seam corrosion is to orient the weld seams toward the building roof to prevent the weld from being located under deposits within the pipe.

RESIDUAL WATER IN DRY PIPE SYSTEMS

Residual water in dry pipe or preaction systems is the leading cause for corrosion and leakage of galvanized steel pipe in these systems. The presence of the air gap above the residual water results in high dissolved oxygen and carbon dioxide contents in the water and makes it corrosive to galvanized steel sprinkler pipe. New dry and preaction systems can develop through wall leakage within as little as two years after installation due to residual water.

Draining residual water from these dry systems after hydrotesting or maintenance inspection is the most effective way of mitigating corrosion. In practice, this can be difficult due to inadequate pitching of the pipe or use of pendent sprinkler drops that prevent all water from being drained from the system.

Another mitigation approach is to fill the dry pipe or preaction systems with nitrogen gas. Filling these systems with nitrogen gas removes oxygen and decreases oxygen-related electrochemical reactions.

TRAPPED AIR IN WET PIPE SYSTEMS

Trapped air in wet pipe systems provides the oxygen source for steel pipe corrosion. Minimizing air pockets in wet pipe systems is recommended. An air release valve, which is capable of venting trapped air in the pipe, can mitigate this kind of corrosion. Limiting the introduction of oxygenated fresh water into the

pipings system can also be an effective mitigation strategy for wet pipe systems. Similar to the dry pipe or preaction systems, nitrogen gas can also be used as a supervisory gas to reduce oxygen concentrations in the sprinkler water of wet systems.

WATER CHEMISTRY

The corrosiveness of sprinkler water in fire protection systems is significantly influenced by water quality. The chemistry of the water—concentration of dissolved gases (O₂, CO₂) and dissolved anions (chloride, sulfate), pH, alkalinity and the presence of microorganisms—will impact the corrosiveness of the water. Higher dissolved oxygen concentrations, for example, greatly increase the corrosion rate. For this reason, only treated water, such as municipal water, should be used as the source of sprinkler water and untreated raw water should be avoided.

CORROSION MONITORING

There are many recommended methods for monitoring corrosion in sprinkler systems, such as coupon measurements, internal visual inspections and ultrasonic thickness measurements. The effectiveness of some of these techniques may be questionable since the most severe corrosion is often localized. Internal visual examination using a borescope or video-borescope is the most practical and effective method for evaluating corrosion in fire protection systems.

PLASTIC MATERIALS

Plastic materials (CPVC pipes and fittings) have successfully been used in fire protection systems for more than 30 years owing to their corrosion resistance properties, long-term durability, and ease of production and installation. However, similar to metals, plastic products do suffer degradation and failure in service.

Failure of CPVC piping can occur when they are exposed to organic chemicals and put under stress. The plastic can absorb organic chemicals, reducing its strength. This absorption process is accelerated when the plastic is under applied stress, which can lead to environmental stress cracking (ESC), the most common failure of CPVC piping in fire protection systems. Paints, adhesives, cleaning agents, lubricants and other organic fluids with modest hydrogen bonding can weaken the plastic.

FM Global recommends applying only those chemicals approved by Lubrizol, FM Approvals and UL for hybrid CPVC fire protection systems to avoid potential ESC failures.

CORROSIVE ENVIRONMENTS

Many industrial plants remove smoke, fumes

and dust generated during the industrial process through exhaust ductwork systems, some of which are made of plastics or fiber-reinforced plastics (FRP). These systems include flue gas desulfurization systems, metal acid pickling ducts, chemical industry exhaust systems, power generation industry exhaust systems, and pulp and paper industry exhaust systems.

These duct systems create highly corrosive atmospheres where short circuits, hot work, friction and spontaneous ignition of deposits can cause fires. Fire damage to these systems can lead to interruption of plant operations for an extended period of time with substantial financial losses. Some sprinkler systems have proven ineffective in protecting against fires originating within these ducts, partly because of the highly corrosive atmosphere.

FM Global has developed a corrosion-resistant fire sprinkler system for industrial exhaust ducts. The system was designed based on results from laboratory and field tests, along with data from manufacturers. This system is comprised of corrosion-resistant sprinkler nozzles, linear heat detector (LHD) wires and fire control panels, flexible sprinkler connections and other accessories. It is designed to be suitable to protect combustible exhaust ducts from fires in extremely corrosive environments.

FURTHER STUDY

FM Global research has identified two areas that require further study: the use of corrosion inhibitors and the value of water filtration.

Corrosion inhibitors are regularly used in many industries to mitigate corrosion, such as boiler water treatment, cooling water systems and waste water treatment. Each service environment requires special combinations of corrosion inhibitors to effectively and efficiently mitigate corrosion.

Corrosion inhibitors could also be used for fire protection systems, but systematic study and field testing needs to be done. Compatibility tests of these chemicals with other materials used in fire protection systems (CPVC and other types of plastic piping, sprinkler heads, O-rings, rubber gaskets) should be carried out before any field applications.

Water filtration or treatment systems should also be explored. Treating source water (ion exchange or chemical precipitation) could remove aggressive anions from the sprinkler water, greatly reducing water corrosivity.

To view the full research paper, Corrosion and Corrosion Mitigation in Fire Protection Systems, go to fmglobal.com/research and click on Research Technical Reports by David Fuller is assistant vice president, senior engineering technical specialist, and Dr. Paul Su is senior lead research scientist, FM Global.

For any queries please contact Sumit Khanna who is consultant, international codes & standards group of FM Global based in India.

BREATHING APPARATUS - UNDERSTANDING THE NEED OF TRAINING

“In this two part series about “Breathing Apparatus”, here, the basics of Breathing Apparatus, the requirement of Breathing Apparatus in Fire Service & the most common type of Breathing Apparatus along with the features used in Fire Service is highlighted”.



KIRAN HATYAL
Sr. Instructor
Maharashtra Fire Service Academy

Very often firemen have to enter an unknown space during fire-fighting. The task becomes more difficult if the area has zero visibility and is completely filled with smoke. Huge & Multiple Basements, Large floor plate areas such as that of mall are the areas of concern. The most important attribute that is required in a fireman is self confidence and not to panic in any such kind of situation.

One may provide all kinds of high ended sophisticated Personal Protective Equipment; but what he really needs is the inner confidence and this can be achieved through hard training only.

This article on Breathing Apparatus, highlights the importance of Breathing Apparatus Set (B.A. Set) in Fire Service, the most regular used set in Fire Service (without any bias to any brand / make) and the most important role of the mode of training which is to be imparted by fire service to train their fireman for handling such set and to overcome any situations they may face.

In oxygen deficient areas, there is a standard operating procedure for wearing B.A. set before entry. It is not just the guidelines which are required to be understood about the importance of B.A. for such scenarios. Wearing a B.A. set will encourage the Fire personnel to bravely enter the unknown / zero visibility area.

In this two part series, Mr. Kiran Hatyal Sr. Instructor from Maharashtra Fire Academy highlights the importance of B.A. donning

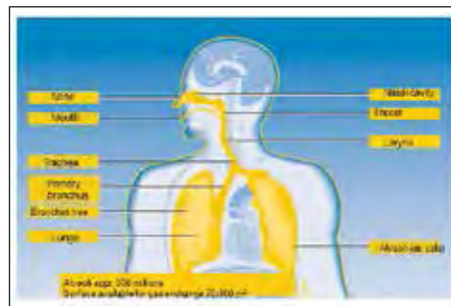
procedure, testing procedure and emphasis on the training module.

PHYSIOLOGY OF RESPIRATION:

In order to understand the true requirement of Breathing Apparatus, it is very essential to know the physiology of respiration.

Breathing or respiration- is a spontaneous action performed by the human body some 15-30 times every minute. When at rest the body requirements are comparatively low and amount of air sucked by lungs during breathing is at a rate of 15-18 times per minute. When more energy is exerted either through work or nervous excitement the breathing rate is increased and may be as much as 30 times a minute or even more.

At rest, about 30 cu. In. (1/2 Liter approx) air is normally inhaled at each breath and about the same quantity is exhaled; this amount is known as Tidal Air.



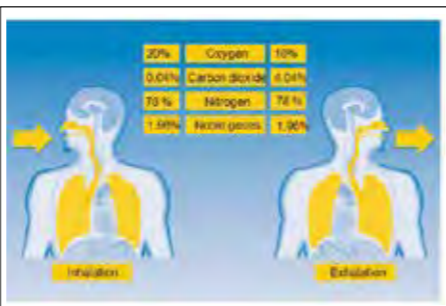
EFFECT OF RESPIRATION :

Before the student is taken into details, he should understand the effect of respiration, i.e., what takes place during inhalation and exhalation of air.

INHALED AIR BY VOLUME :		%
Nitrogen		79.04
Oxygen		20.93
Carbon-di-oxide		0.03

EXHALED AIR BY VOLUME :		%
Nitrogen		79.04
Oxygen		16.96
Carbon-di-oxide		4.80

This is to say about 4 per cent of oxygen is absorbed and an equal amount of Co2 exhaled.



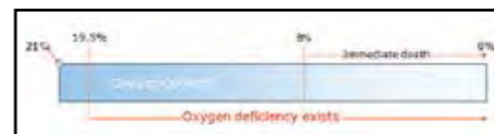
POTENTIAL EFFECTS OF OXYGEN-DEFICIENT ATMOSPHERES

Oxygen Content (% by Volume) (At Atmospheric Pressure)	Effects and Symptoms
19.50%	Minimum permissible oxygen level.
15-19%	Decreased ability to work strenuously. May impair coordination and may induce early symptoms in persons with coronary, pulmonary, or circulatory problems.
12-14%	Respiration increases in exertion, pulse up, impaired coordination, perception, judgement.
10-12%	Respiration further increases in rate and depth, poor judgement, lips blue.
8-10%	Mental failure, fainting, unconsciousness, ashen face, blueness of lips, nausea, and vomiting.
6-8%	8 minutes, 100% fatal; 6 minutes, 50% fatal; 4-5 minutes, recovery with treatment.
4-6%	Coma in 40 seconds, convulsions, respiration ceases, death. These values are approximate and vary as to the individual's state of health and his physical activities.

Oxygen deficiency can occur in confined or enclosed spaces, during fires or large chemical releases.

Normal air contains 21% oxygen. An area with oxygen content below 19.5% is considered "oxygen deficient".

Only a supplied air respirator can protect against the effects of oxygen deficiency.



These situations can occur in fires, enclosed spaces, pits and underground structures, sewers, silos and storage tanks. For satisfactory functioning of the body, the air breathed must contain at least 20% oxygen. Any reduction of the oxygen content will have an adverse effect on the body. The term used to describe the prevention of oxygen reaching the lungs is called asphyxia. The depletion of oxygen inside the body is known as hypoxia. In hypoxia the tissues deteriorate very rapidly - brain cells start to die if their supply of oxygen is interrupted for longer than 3 minutes. If hypoxia is not swiftly reversed, breathing and the heart may stop.

The symptoms include, rapid breathing, gasping, blueness of skin, confusion, irritability, unconsciousness and death. However, in many cases people may be unaware that hypoxia is occurring.

The consumption of air while carrying out different work is given below:-

Degrees of Exertion	Oxygen Consumed Litres Per Minute	Air Breathed Litres Per Minute	Volume of Air at each (Litres)	Number of Respirations
Rest in bed	0.237	7.7	0.457	16.8
Rest standing	0.328	10.4	0.612	17.1
Walking at 2 mph	0.780	18.6	1.27	14.7
Walking at 3 mph	1.065	24.8	2.53	16.2
Walking at 4 mph	1.595	37.3	2.06	18.2
Walking at 5 mph	2.543	60.9	3.14	19.5

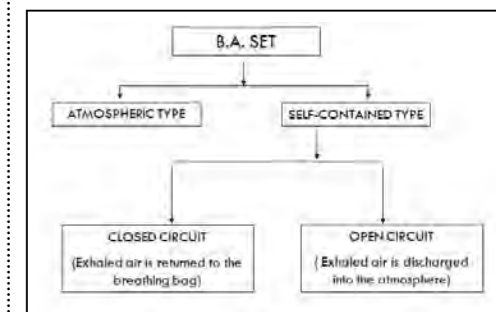
1Mph = 1.60934 kph

Even if two persons are carrying out the same task, and if the factors are kept constant but if there is slight change in conception in thinking capacity, the air consumption in litres may vary.

For eg., two persons A & B are given sets of identical question papers which requires one hour to solve and keeping all the factors constant such as environment, their IQ level ; but for one factor i.e time period, in which A is asked to complete the paper in 10 minutes and B in 60 minutes, one can easily imagine that for which person heartbeats will be quicker. Definitely, it will be "A" who will start to panic, even sweat and start to consume rather more air than "B". It is this panic situation which needs to be controlled at scene of fire and more importantly where there is a situation known as "Entrapped".

- In normal working condition, the rate of inhalation is 16 times per minute approx.
- The variation in air consumption and respiration may vary in degrees of exertion.
- Note: 28.3 litres - 1 cubic foot.
- In heavier work, such as ascending an incline or running, the oxygen consumed may amount to 3 litres per minute, while the volume of air breathed may reach over 100 litres per minute.

TYPES OF BREATHING APPARATUS



1. ATMOSPHERIC TYPE:

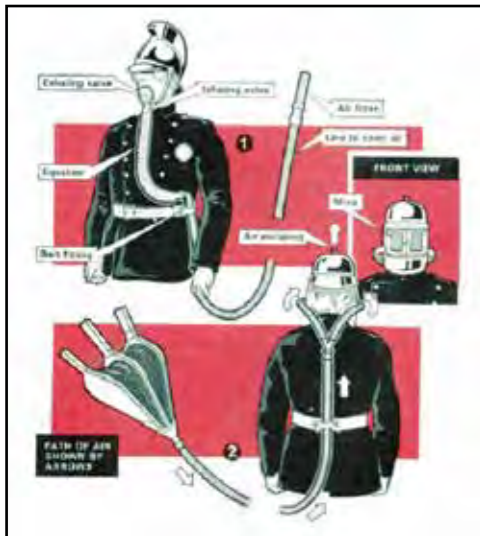
The earliest types consisted of a muzzle fitting to the mouth with valves connected to

which were tubes, the ends of which remained in the outer air. This type was used for a considerable period, in default of anything better, but suffered from the disadvantage that the energy required to overcome the friction of the air passing through the pipe had to be provided by the respiratory efforts of the wearer and breathing was consequently extremely difficult.

A more complex apparatus consisted of an airtight helmet and jacket of cowhide fitted with a hose-coupling to which air was pumped through delivery hose. In this type the exhaled air escaped down under the skirt of the jacket and helped to keep the wearer cool in hot atmospheres. This was an apparatus by which the wearer drew a supply of air from the atmosphere by his own effort. It was designed to work at a short distance from fresh air only. It comprised a face-piece, with non-return outlet valve for the passage of the exhaled air and a flexible corrugated tube of rubber connected to the

base of the face-piece to which was fitted a non-return inlet valve.

A length of strong wire-embedded air pipe, the bore of which was smooth in order to reduce resistance to inhalation, was connected to the valve inlet. The free end of the tube, usually 18 m long, was secured in fresh air, a strainer being fitted to prevent the ingress of foreign matter.



The disadvantages of this type of apparatus were:

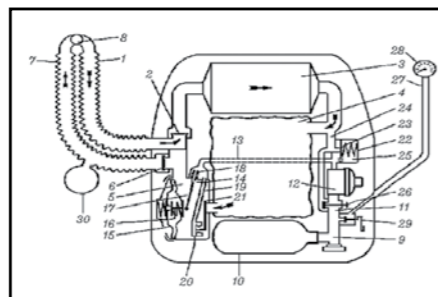
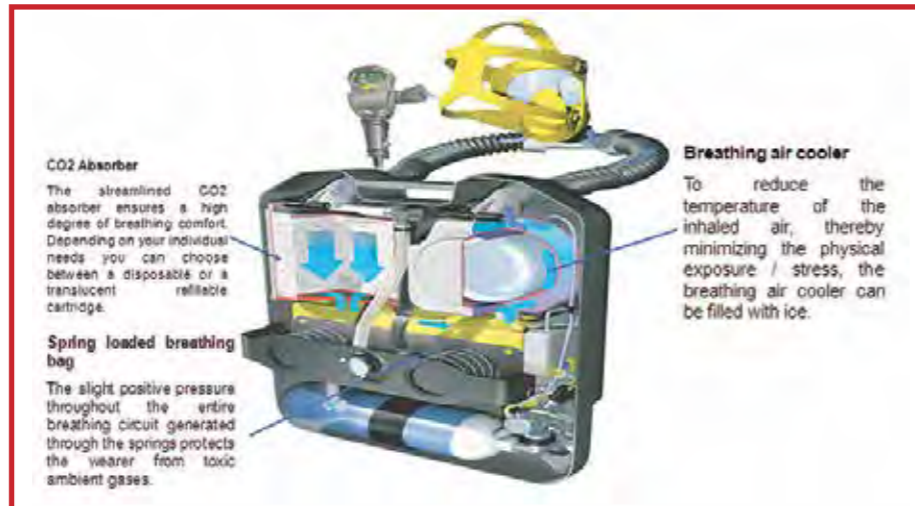
- The air tubing had to be trailed behind the wearer, thus restricting his movements to a certain extent and limiting the distance to which he could travel.
- The air tube could be cut or damaged by falling debris or other causes.
- The supply of air was dependent on the respiratory efforts of the wearer and involved considerable exertion and most important
- A constant supply of air was always dependent upon a second person.

More and more brigades discarded this type of apparatus in favour of a 'self-contained' apparatus in which the wearer carried his own supply of air or oxygen. Nevertheless, despite the limitations of atmospheric types of breathing apparatus, their use continued on a diminishing scale until the beginning of World War II.

2. SELF CONTAINED:

A. CLOSED CIRCUIT

The forerunner of the self-contained oxygen breathing apparatus now widely used in this country was introduced into fire brigades around 1912. This apparatus was a development of that used in the mines and was a self-contained closed circuit type. A cylinder of oxygen was carried sufficient for a duration of up to 1 hour. The exhaled breath was returned to a breathing bag containing an absorbent which removed the carbon dioxide; it was then



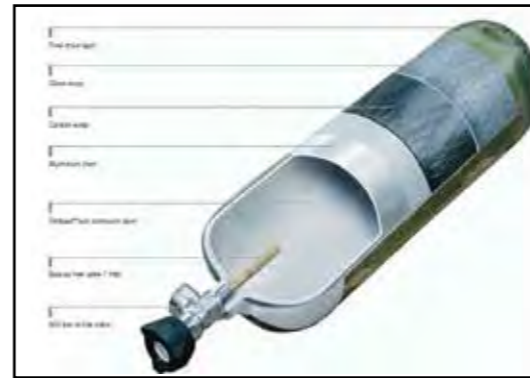
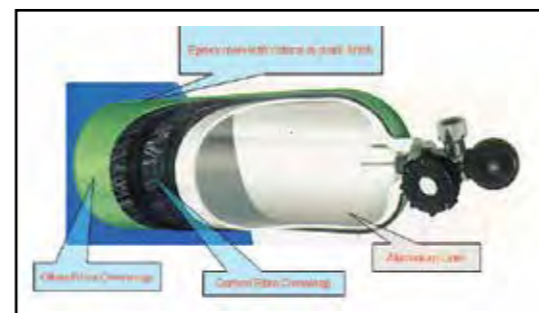
1. Exhalation Tube
2. Exhalation Valve
3. Canister
4. Breathing Bag
5. Valve Group Assembly
6. Inhalation Valve
7. Inhalation Tube
8. Facemask Connection
9. Cylinder Valve
10. Oxygen Cylinder
11. Oxygen Distributor
12. Pressure Reducer
13. Medium Pressure Line
14. Metering Orifice
15. Diaphragm
16. Cutter Pin
17. Lung Demand Valve Needle
18. Lung Demand Valve
19. Warning Signal Control Line
20. Warning Signal Control
21. Warning Signal Flap
22. Pre-flush Unit
23. Pre-flush Diaphragm
24. Pre-flush Line
25. Pre-flush Chamber
26. Manual Bypass Valve
27. Pressure Gauge Line
28. Pressure Gauge
29. Pressure Gauge Shutoff
30. Saliva Trap

- Black & White
- Features like Working Pressure, Filling pressure, Capacity, Manufacturer's name, Cylinder Number, CCE Cylinder Number etc. are embossed on it.
- The apparatus shall operate trouble-free over the temperature range - 30°C to + 60°C
- Lately, very light weight Carbon Composite Cylinders are also available.

PARTS OF CYLINDER



COMPOSITE CYLINDERS



Capacity

- 400 Litres [ELSA - Emergency Life Support Apparatus]
- 1200 Litres
- 1400 Litres
- 1600 Litres
- 1800 Litres
- 2250 Litres
- 3200 Litres [ULCC - Ultra-Light Carbon Composite]

But normally, three types of cylinders are available:-

- 1200 litre cylinder charged to 132 atmospheres (1900 lbf/in²) (132 bar)
- 1800 litre cylinder charged to 200 atmospheres (3000 lbf/in²) (207 bar)
- 2250 litre cylinder charged to 200 atmospheres (3000 lbf/in²) (207 bar)

CYLINDER WEIGHT:

Steel Cylinders

Water Capacity (ltr)	Service Pressure (bar)	Free Air Capacity (ltr)	Full Nominal Duration (Mins)	Weight Fully Charged (Kgw)
9.00	207	1,863	45	13.00
6.00	300	1,854	45	12.30

200 Bar Carbon Composite

Water Capacity (ltr)	Service Pressure (bar)	Free Air Capacity (ltr)	Full Nominal Duration (Mins)	Weight Fully Charged (Kgw)
9.00	207	1,863	45	7.00

300 Bar Carbon Composite

Water Capacity (ltr)	Service Pressure (bar)	Free Air Capacity (ltr)	Full Nominal Duration (Mins)	Weight Fully Charged (Kgw)
9.00	207	1,863	45	13.00
6.00	300	1,854	45	12.30

VALVE ASSEMBLY

- The cylinder valve is protected by a rubber buffer and the hand wheel is fitted with a ratchet to prevent the unintentional shutting of the cylinder valve.
- In order to prevent damage to the

threads, and/or ingress of dust into the valve, dust plugs must be fitted when the cylinder is not connected.

- Contains more than 50 tiny parts
- Shall not be opened or repaired
- Water, Oil or Powder shall not be used for any purpose
- It allows Air to come out with the pressure

Duration:

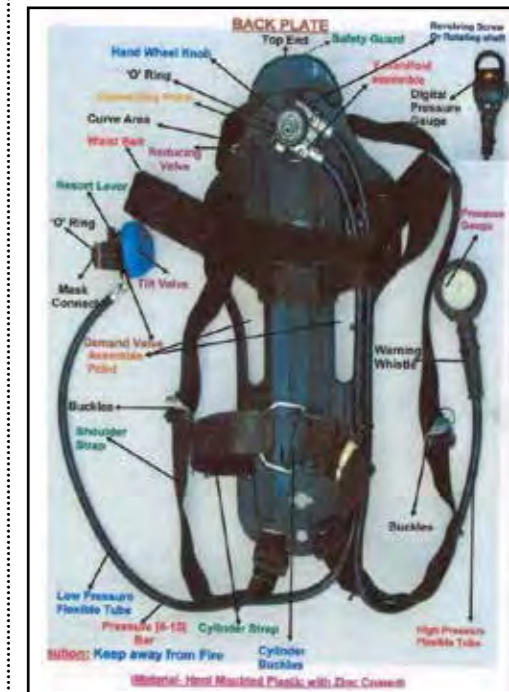
The duration of the set depends on the amount of work carried out by the wearer and his breathing efficiency but most important Air Volume of Cylinders in Litres and Air Volume of Cylinders depends upon water capacity of cylinders in Litres and recommended pressure of Cylinders in Bar. For Eg Water Capacity is either say 6.0 Ltrs & 9.0 Ltrs and Recommended Pressure is 200 Bar & 300 Bar and therefore Air Volume will be 200 X 6 = 1200 Ltrs., 200 X 9 = 1800 Ltrs., 300 x 6 = 1800 Ltrs & 300 x 9 = 2700 Ltrs (rather 2250 Ltrs) and thus capacity of cylinder is given as below:

Air Volume of Cylinder in Litres / Air consumption per Minute

For the purpose of these calculations, it is assumed that the wearer has an approximate air consumption of 40. l/min. and thus we can have 1200 / 40., 1800/40 & 2250 /40 which is also called as "Full Duration" of the Cylinder.

Working Duration is given as Air Volume of Cylinder in Litres/ Air consumption per Minute) - Safety Margin. The standard safety margin of 10 minutes is allowed and thus we can have (1200/40) - 10 = 20 min; (1800/20) - 10 = 35 min & (2250/40) - 10 = 46 min

- Straps are constructed of flame retardant polyester/nylon with closed cell padding.
- Full padded backpad.
- Pelvic support strap.
- Approx weight less cylinder = 3 kg



REDUCER ASSEMBLY

- It is a device with controlled high pressure air and helps to reduce high pressure to 6 to 8 Bar and also contain high pressure safety bursting disc
- The BA set is designed to convert cylinder pressures to more manageable, breathable pressures in 2 distinct stages. The first stage is accomplished by the pressure reducer. Pressures are reduced from cylinder pressure (anything from a minimum of 207 bar) down to 7 + - 1 bar ready for acceptance at the demand valve.
- A safety feature to prevent over pressurizing of the low pressure side of the device is provided. The valve is designed to discharge excessive pressure caused by a failing reducer, to waste, rather than allow pressure to build up and transfer to the demand valve. A calibrated spring (11.5 bar) holds the valve closed until pressures rise to an unacceptable level.

PRESSURE PIPES

- The hose leading to the pressure gauge also known as "High Pressure Pipe" is stainless steel braided. It has a test pressure of 450 bar with a burst pressure of 800 bar. A flow restrictor in the reducer will restrict flow to approximately 8-9 lpm at 70 bar should a defect occur in the hose.
- The demand valve supply hose also called as "Low Pressure Pipe" is nitrile reinforced

with a test pressure of 16 bar and a burst pressure of 80 bar.

- Metallic high pressure tubes, valves and coupling shall be capable of withstanding a test pressure twice the maximum filling pressure or 50 per cent of the maximum filling pressure.
- Non-metallic parts shall be capable of withstanding a test pressure twice the maximum filling pressure of the cylinder.

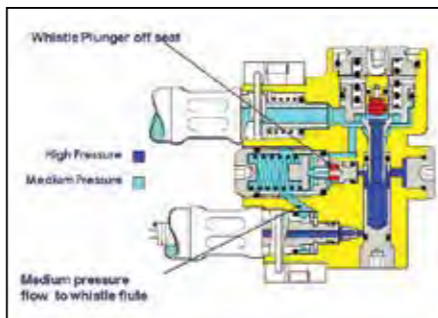
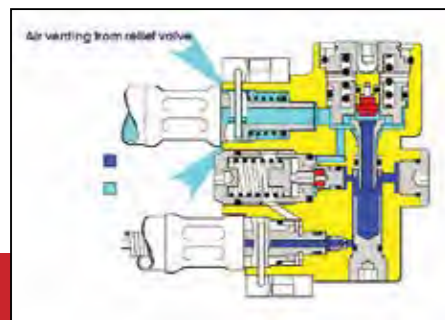
High Pressure Gauge

- Device to measure the quantity of air
- Calibrated with recommended cylinder pressure
- Red indication mark from 40 to 45 Bar for low pressure
- A Bourdon Tube type gauge gives the wearer a constant indication of cylinder pressure. The casing is constructed of stainless steel.
- The gauge is calibrated from zero to 350 bar in 10 bar calibrations.
- It has a luminous backplate with black pointer and marks every 50 bar.
- A flow restrictor in the base of the gauge.
- - Heavy duty neoprene cover.
- - Polycarbonate shatterproof window.
- - A blow out disc in the back of the gauge.
- The gauge window is made of a material of non-splintering glass or of clear plastic material.

WARNING WHISTLE

- It is a safety device and gives whistle as a warning to wearer that supply of air in cylinder is low
- The low pressure warning whistle is actuated by a change in cylinder air pressure. The whistle sounds when the cylinder pressure drops to 20% of the fully charged cylinder capacity (45-40 bar).
- The warning device shall respond at the latest when only one-fifth of the total breathing air volume is left
- The operation of the whistle marginally affects the duration of the set, with a consumption of 2 litres of air per minute.
- If there is an audible warning device the acoustic pressure level shall be a minimum of 90 dB (A) as a continuous or intermittent warning at the wearers ears. The frequency range shall be between 2 000 Hz and 4 000 Hz.
- The duration of the warning at 90 dB (A) shall be at least 15 sec for a continuous signal and 60 sec for an intermittent signal.

WHISTLE ACTIVATION

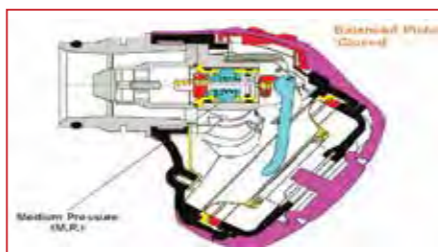
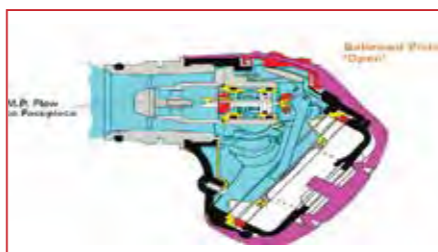


LUNG CONTROL DEMAND REGULATOR:

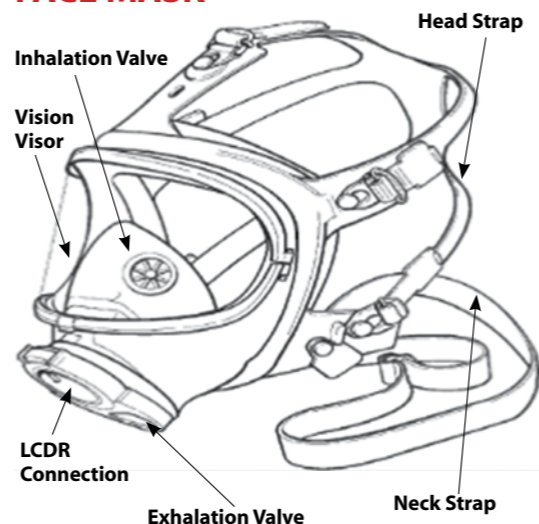
- Supply of air as demanded by the wearer
- Control the supply of air and reduces from 7 to 8 Bar to 1 Bar (1.004 Bar)
- Also known as Positive Pressure B.A. set due to this characteristic
- Easy to breath for B.A. wearer
- Entry of atmospheric gases containing poisons or toxins is restricted
- The BA wearer feels cool and increases his working capacity
- Prevents formation of moisture on vision visor
- Positive B.A. have minimum failure changes
- In positive pressure air supply is continuously and more than atmospheric pressure i.e 1.004 bar

DEMAND VALVE FIRST BREATH MECHANISM

- When the BA set is first turned on, air will flow into the demand valve but will not flow from the outlet port into the facemask. The air is held back from this final stage by the 'first breath mechanism'.
- The mechanism is actuated by lowering the pressure within the facemask, which is done on inhalation by the operator. This will allow the set to be switched on without the facemask having to be held onto the face.



FACE MASK



- All rubber parts of face mask are made up of high quality neoprene rubber.
- The vision visor is made up of high quality polycarbonate plastic.
- The facemask is a panorama full vision mask made of anti-dermatic neoprene.
- It has a reflex seal and a polycarbonate visor. It has a removable ori-nasal inner mask and speech diaphragm.
- A neoprene neck strap and adjustable head harness.
- In this two part series about "Breathing Apparatus", the basics of Breathing Apparatus, the requirement of Breathing Apparatus in Fire Service & the most common type of Breathing Apparatus along with the features used in Fire Service is highlighted.

“In the second and Concluding Part, we shall deal with various Testing Methods, Care and Maintenance, Donning & Doffing Method and most important the Training Procedure to be followed during training and Dos and Don'ts of Breathing Apparatus for Commanding Officer as well as for the Wearer.”

HIGH RISE BUILDING SAFETY – CHALLENGES AND THE CHANGING TRENDS

WE LEARNT A LOT FROM PAST INCIDENTS AND AS A RESULT OF NUMBER OF EYE OPENER FIRE INCIDENTS, THE FIRE SAFETY ARRANGEMENTS, EMERGENCY EVACUATION AND PREPAREDNESS WERE GIVEN PRIORITY WHILE DEVELOPING A HIGH RISE STRUCTURE.



PURUSHOTAM SINGH
Dy. Manager Fire Safety
DLF Gurgaon

History of High Rise Buildings:

The history of today's high rise structures or so called skyscrapers are years old. When we look back in the era of Chariots and Palki which were the only means of transportation at that time, there existed some big structures like Brihadeshwara Temple. A Hindu temple dedicated to Lord Shiva in Tamilnadu state constructed in 1010 AD during the statesmanship of Chola dynasty king Raja Chola is approx. 66mtr in height. Qutub Minar (1368) – 72.5 mtr and Taj Mahal (1653) - 73mtr are other examples. The concept of high rise structures in ancient ages had been limited to temples, monuments and castles only.

From there we have witnessed Rajabai Clock tower, Mumbai (1878) – 85mtr. and World trade center, Mumbai (1970) – 156 mtr, Palika Kendra, Delhi (1971) 91mtr., State Trading Corporation Building, Delhi(1983) – 120 meter to Imperial tower 1, Mumbai – 254 mtr. Over a period of time people start migrating from villages to cities in search of better scope for jobs, education, luxury and life style. Industries, trade and commerce activities and number of educational institutions in cities attract floating population from villages and districts. This has expanded the cities in all directions and all aspects of development which resulted in rise of demand for residential and office space.

To meet the increasing demand of residential and commercial office space for fast growing population in urban areas, the concept of high rise structures developed over a period of time. While making high rise structures developer's prime focus used to be the maximum utilization of space for residence, office and utility purpose.

Major Fires in Indian History:

Fire safety arrangements were given lesser importance in initial stages. Let's have look on some fire incidents

- State Bank of India Building, Mumbai a 19 storey complex caught fire on 14th January, 1972. The fire originated from a room at 15th floor and it spread through the horizontal and vertical openings available. 9th, 14th, 15th, 16th, 18th and 19th floors were affected by fire. Fire-fighting operation went on for almost 20hrs. 4 people found dead due to inhalation of smoke and toxic gases. This was considered the first high rise fire in India. It raised the importance and interest of community for fire safety aspects of high rise buildings.
- A fire broke out in Siddhartha Continental Hotel, Delhi on 23rd January, 1986. This hotel had 10 floors and 2 basements. The fire started in a banquet hall located in basement and it was not detected in the initial stage. Lower floors were engulfed by fire and smoke entered in upper floors. 37 people lost their lives and 75 were

hospitalized.

- Uphaar Cinema, New Delhi – A major fire broke out in the evening of 13th June, 1997 in a cinema building, Uphaar in Green Park area. This fire was initiated with a blast in the transformer installed in the parking area. 48 fire tenders and more than 200 fire fighters were involved in fire - fighting and rescue operation till late night. Death toll hit 59 and a total of 200 were injured including CFO, DFS. Like in every fire incident the main cause for deaths was suffocation and inhalation of smoke and toxic gases.

Current Scenario:

We learnt a lot from past incidents and as a result of number of eye opener fire incidents, the fire safety arrangements, emergency evacuation and preparedness were given priority while developing a high rise structure. State fire prevention acts came into existence and National Building Code draw fire experts attention. This is how we have travelled the journey of firefighting arrangements from sand buckets to automatic fire suppression systems. The manually operated escape ladders and extension ladders are now replaced by turn table ladders and hydraulically operated platform which enable us to perform rescue and firefighting operations at comparatively more heights.

The latest trend is going for higher hydraulic platforms. Chennai has ordered a hydraulic platform for a capacity of 104 meter height. Three 90 meter and several 70 meter hydraulic platforms are operational in different parts of the country. But still a lot more needs to be done with regard to fire safety. Even though we have attained considerably better fire technologies, we faced some following incidents in the recent past which needs a brain storming in this regard -

- AMRI Hospital, Kolkata (09.12.2011) – 93 dead
- Lotus Business Park - Andheri Link Road, Mumbai – One Fireman died (Sh. Nitin Yevlekar)



- Gokul Niwas building, Kalbadevi, Mumbai – 4 fire service staff (CFO – Sh. Sunil H Nesarikar, DCFO – Sh. Sudhir Amin and ADFO – Sh. Sanjay W Rane and STO – Sh. Mahendra N Desai)

Unfortunately fire safety arrangements are taken as legal obligations for getting Fire NOC to enable business to run. These are not considered for saving life and property in most of the organizations. At



the time of Fire NOC Inspection, fire safety arrangement can be seen well in place but nobody bothers after getting fire NOC. Fire NOC is subjected to renewal in 5years / 3years and one year in some parts of the country.

Fire protection equipments are used irregularly, there are chances of malfunctioning, damage and tempering by individuals. As far as fire protection arrangements are concerned, some building owners seek cheaper solutions. These buildings are most vulnerable and non-availability and non-operational status of systems have led to havoc some times. It should be remembered that fire protection systems within a building are readily available resources for fire fighters to deal with fire emergencies within the buildings.

Even fire evacuation drills which are exclusively meant for education and preparedness against emergency are not given importance by our educated society. NBC –



2005 clearly states that fire drills shall be conducted, in accordance with the Fire Safety Plan, at least once every three months for existing buildings during the first two years. Thereafter, fire drills shall be conducted at least once every six months. Though fire drills are conducted but for the purpose of creating video evidence for submitting to local fire brigade at the time of NOC renewal. Seriousness and participation in fire evacuation drills is a challenge today. Most of the time very important people did not evacuate and participate in such drills.

What "Good" Looks Like:

There should be commitment from top level and a robust mechanism for main-

taining the fire and life safety standards to be developed. Following are some examples of best practices which may be adopted in this regard –

- A well trained , experienced fire safety team for buildings (Even clause C - 6.1 of Part 4, NBC-2005 recommends about fire officer for high rise building of specific occupancies)
- Fire protection equipment manufacturer / supplier who provide fire equipment and installation can be engaged for at least 5 years to be held accountable for testing and maintenance
- Fire safety Policy and Fire safety management system which includes at least the following



UNFORTUNATELY FIRE SAFETY ARRANGEMENTS ARE TAKEN AS LEGAL OBLIGATIONS FOR GETTING FIRE NOC TO ENABLE BUSINESS TO RUN. THESE ARE NOT CONSIDERED FOR SAVING LIFE AND PROPERTY IN MOST OF THE ORGANIZATIONS. AT THE TIME OF FIRE NOC INSPECTION, FIRE SAFETY ARRANGEMENT CAN BE SEEN WELL IN PLACE BUT NOBODY BOTHERS AFTER GETTING FIRE NOC.

- > Policy Statements
- > Statutory requirements pertaining to life and fire safety
- > Testing and Maintenance schedule for fire protection arrangements
- > Standard operation procedures for testing and maintenance
- > Safe work practices and permit to work system
- > Fire safety training and drills for staff and occupants
- > Incident capturing and route cause analysis mechanism
- > Frequent fire safety review and safety committee meetings
- > Activities to develop a positive safety culture in the organization

● Third Party fire and safety audit by a competent agency – Engaging a third party fire and life safety audit agency to assess the level of adopted standards, provisions, preparedness, performance of system / staff and key areas of opportunity to improve the system is another proactive step to enhance safety. Third Party agencies provide detailed reports on shortcomings and non-compliance areas. These observations are classified into different categories for example statutory requirements and good practices. Based upon these classifications priority for rectifying actions may be decided. The competency and experience of third party agency should be given importance while shortlisting for conducting fire and life safety audits. There are number of international agencies providing quality service in this field.

We all know and even past incidents investigation reports also concluded that a major contributory factor to fire incidents is electrical. A number of technologies like circuit breakers, earth leakage circuit break-



ers, fire retardant wires, FRLS cables and portable gas / powder based quick response automatic fire suppression system for electrical panels are available in the market. By having these technologies electrical fire, having potential to create a disaster,

WE LEARNT A LOT FROM PAST INCIDENTS AND AS A RESULT OF NUMBER OF EYE OPENER FIRE INCIDENTS, THE FIRE SAFETY ARRANGEMENTS, EMERGENCY EVACUATION AND PREPAREDNESS WERE GIVEN PRIORITY WHILE DEVELOPING A HIGH RISE STRUCTURE. STATE FIRE PREVENTION ACTS CAME INTO EXISTENCE AND NATIONAL BUILDING CODE DRAW FIRE EXPERTS ATTENTION. THIS IS HOW WE HAVE TRAVELLED THE JOURNEY OF FIREFIGHTING ARRANGEMENTS FROM SAND BUCKETS TO AUTOMATIC FIRE SUPPRESSION SYSTEMS.

can be extinguished or spread of fire can be restricted. These all activities required budgets and so it solely becomes the matter of interest of individual organization except compliance with mandatory requirements. Most of the organizations cut corners in the name of safety but there are some conscious builders who value safety more than anything and invest in employ-

CONCLUSION:

There is a strong requirement to develop the noble concept of fire safety in every building developer, occupants, visitors and facilitator by means of obligation, monitoring and effective training awareness programs. Being part of this developing scenario it needs to be understood by all that investment in fire safety may not give immediate returns but provide a strong foundation for bigger growth with safe lives and property.

ee and tenant safety.

Source:

- Wikipedia – Timeline of tallest building of India and Google Images
- MAJOR HIGH RISE BUILDING FIRES IN THE WORLD – Compiled By Sh. G.B. Menon
- NAFO Generals
- National Building Code of India



► Mr. Ferdinand Roberts paying homage at the Cenotaph bearing his father's name

Unforgettable Emotional Moment

We are saddened to note the passing away of Mr Ferdinand Roberts in Perth Australia this year.

He was named in memory of his dear father Auxiliary Fire Officer Ferdinand Roberts who had died battling the inferno in the devastating Bombay Dock Explosion in 1944.

His mother had told him several tales about his father's bravery, it was only a couple

of years ago that Mr. Roberts chanced upon the NAFO website, which carried the list of martyr's (Listed ninth in the list)

Mr. Roberts had never seen his father, for he was born five months after that fateful day in Bombay. He had then migrated and was now settled in Australia.

But he was determined to visit Bombay, India, "I had a bucket list, where I had listed out all things which I wanted to do during my life-



► Ferdinand Roberts being felicitated at the Fire Week function on 20th April 2014.



► Ferdinand Roberts with his family at the Fire Safety Week function

time. This was one of them," he had stated.

Mr. Roberts accompanied by his granddaughter and her boyfriend visited us last year and paid his respects offering a wreath at the Cenotaph listing the Bravehearts names.

"It was a proud and an emotional moment." Mr. Roberts had expressed then.

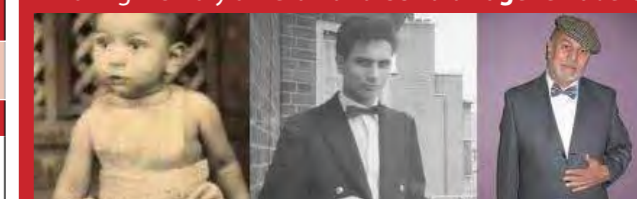
He was also felicitated at the Fire Week function on 20th April 2014.

May his Soul rest in Peace.

Martyrs Who Died While Attending Operational Duties (Died At The Altar Of Duty) In The State Of Maharashtra

Sr. No	Full Name of Martyrs S / Shri	Designation	Date & Year of Martyrdom	Brief account of incident involved in
Mumbai Fire Brigade, Mumbai				
1	Robert Thomson	Acting Chief Officer	13-08-1915	Fire on board the Hospital Ship Madras at Alexandra Docks.
2	Harold Palmer	Asstt. Officer Commanding	14-04-1944	While fighting the conflagrations of Dock Explosion (1944)
3	Robert Chargers G. Andrews	Company Officer	14-04-1944	- do -
4	Arthur D. Reynolds	Company Officer	14-04-1944	- do -
5	Rustom Phirozshah Palamcoat	Station Officer	14-04-1944	- do -
6	Rajaram Meghashyam Chavan	Auxiliary Officer	14-04-1944	- do -
7	Samuel Thomson	Auxiliary Officer	14-04-1944	- do -
8	Mirza Muzaffer Baig	Auxiliary Officer	14-04-1944	- do -
9	Ferdinand Roberts	Auxiliary Officer	14-04-1944	- do -
10	Aron Joseph Days	Auxiliary Officer	14-04-1944	- do -

In Loving Memory of Ferdinand Oswald Eugene Roberts



- Rest in Peace Ferdy -

"You will never be forgotten. You will always be in our hearts. We will treasure wonderful memories with you. We love you for eternity."

The Family thanks all guests for attending today and sending their wishes

3rd September 1944 - 28th April 2015





M. V. Deshmukh
President

To
Mr. Rajnath Singh,
The Hon'ble Home Minister,
Government of India,
Ministry of Home Affairs, North Block,
NEW DELHI.

Sub : Closure of the **National Fire Service College** by emerging it into so called National Disaster Response Force Academy

Ref : Govt. of India, MHA letter F.No.S-8/2010-NDRF, Dated 18.06.2015

Respected Sir,

1. The Fire fraternity across the country was just shocked and shattered with the decision of the Government of India to merge the **National Fire Service College and National Civil Defence College** to create a new entity called as the **National Disaster Response Academy**. The world is looking at the present Government for better reforms to protect the best interest of its citizens. In the new era of OPTIMISM & HOPES, the fire fraternity is not an exception to dream the '**Make In India**' mission of the Government. In the light of the devastating fires across the country, as per the data published by the **NCRB** in 2014, more than 24,000 people died due to fire. In recent fire in Mumbai, 4 **Fire Officers** have laid their lives for the cause of saving life and property of the citizens.

2. In the aftermath of 1944 Dock explosion in Mumbai, the then visionary Government roped in Shri M. G. Pradhan, the **Chief Fire Officer**, erstwhile **Bombay Fire Brigade** to be the **Fire Adviser to the Government of India**, who was given the task to establish the **National Fire Service College (NFSC)**. The **NFSC** was first conceived in **Rampur** in **1955** and taken a birth in the city of **Nagpur** in **1956**. Nagpur was chosen as appropriate location being the centre of the country. The **NFSC** was one of the leading institutions not only in India but in the entire Asia-Pacific region and was catering to the needs of training and development of fire professionals in the country and beyond its borders.

3. The Fire services have a history of more than 1000 years and in India itself the **Fire Services** are the legacy of the British Era and surprisingly in the Nizam State of Hyderabad, there was a **State Fire Service**. Virtually, all fire and life safety vertical has matured to a level of an independent engineering faculty and therefore the **B.E.(Fire)** degree course was started in **NSFC** in the year 1978 and this was affiliated to the Nagpur University. Due to the paucity of infrastructure, this important **B.E.(Fire)** degree was discontinued in the year 2004. But last ten to twelve years, the office of the **DGCD** on behalf of the fire services in the country, with the help of the Fire Adviser to the Government of India and Senior Fire Officers have been pursuing to develop **NFSC** as an institute of excellence. The Government of India had been kind enough to consider the proposal submitted by the office of the **DGCD** which was well prepared in consultation with the important stakeholders and members of the **Standing Fire Advisory Committee (SFAC), MHA, GOI, Director of NFSC, Fire Adviser** to the Government of India and professional heads of the Fire services across the nation. As we understand, the proposal had gone right up to the Cabinet. In 2009, Government of India allocated Rs.205 crores for this noble cause. The work of the development of this institute of excellence is nearing completion; and the country was looking forward to the inauguration of this premier institute at the hands of the Hon'ble Prime Minister of the country. This wave of optimism, hopes and dreams of the Indian Fire Officers had created a motivating wave in the fraternity. But this sudden decision has created an anti-clock wise turbulence which needs to be reversed. In the developed nations like US, UK, Germany, Finland, China Japan, Singapore etc., they have the best of the Fire academies developed on sprawling 20-400 acres of land.

4. MODEL FIRE SERVICE BILL- DEFICIENCIES OF FIRE SERVICES

The Government of India, in the year 1957, came up with the **Model Fire Service Bill** which was circulated to all the State Governments with instructions to bring in the enactment with corresponding changes depending upon the needs of the respective States. The majority of the State Governments got the **Fire Force Bill** enacted by the respective State Legislatures and efforts are on to bridge the deficiencies of this yeomen service. Off late, survey was done and as per XIIIth Finance Commission, the deficiency of fire services accepted by the Government of

India is more than 97%. This is clearly mentioned in the XIIIth Finance Commission report of the Government of India. There was a lot of debate about this deficiency and it was decided by the Government of India to appoint a professional agency to do a realistic gap analysis based on potential hazards and the response mechanism required to be augmented across the nation. The Government of India appointed **RMSI** as an agency and even as per the studies submitted by **RMSI**, the deficiency pointed out by them is phenomenal is to the tune of almost 70% in most of the States. To bridge this gap, the Government of India has been facilitating to augment the fire services in the developing country like India and the major contribution of the Government of India has been the establishment, management and further development of **National Fire Service College** as an institute of excellence to strengthen the fire services with well trained human resources. It is needless to emphasise that the Government of India's decision of closing down this mother institution by merging with some other institution and re-naming it as National Disaster Response Force Academy would be of a bad taste of the basic principle of the welfare State. It is, therefore, requested that the Government of India may kindly reverse this decision to avoid the criticism by the society at large.

5. **The National Association of Fire Officers (NAFO)** which is the only association of the Fire Officers across the country is constrained to submit angst of fire professionals across the nation to reconsider the decision taken by the Government without taking a single Fire officer or stakeholder into confidence. We are having Fire Adviser to the Govt. of India till sometime, but unfortunately I am sure, his views are also not taken into account before deciding the demise of our Alma Mater.

6. **National Fire Service College** has its own significance and if merged may dilute the following :-

- ▶ This will dilute the main objective of providing trained first responders, to the State Fire Services, Local Bodies, Public Sector Undertakings, etc.,
- ▶ The technicalities involved in preventing devastating fires will be diluted by post disaster preference of NDRF.
- ▶ The inability of state government to train their own personnel requires helping hand from the Centre, which may be diluted.
- ▶ The Fire Service being a permanent force at the disposal of State and Municipal Fire Services, the personnel trained by NFSC will be an asset for fire prevention and life safety ..
- ▶ Fire Prevention in line with National & International Codes and Standards.

7. World over, advancement is taking place in Fire protection engineering and science. Many countries have set up their own fire research establishments and research is ongoing in the area of fire loss prevention. The engineers passing out in coming years will be an asset to fire loss prevention for the country.

Let the **NFSC**, a glorious and prestigious institution having trained some of the finest Fire Officers, remain a professional **Fire Service College** without diluting its core purpose.

We, the National Association of Fire Officers earnestly urge you to reconsider this decision and reverse it.

Thanking you,

Yours faithfully,

(M. V. DESHMUKH)
PRESIDENT

Copy respectfully submitted to :-

1. **Shri Narendra Modi**, Hon'ble Prime Minister of India, South Block, Raisina Hill, NEW DELHI-110 001.
2. **Shri Kiren Rijju**, Hon'ble Minister of State, Ministry of Home Affairs, North Block, NEW DELHI - 110 001.

Copy Submitted to:-

1. The Hon'ble Principle Secretary to the Prime Minister of India, Prime Ministers' Office, South Block, Raisina Hill, NEW DELHI - 110001.
2. The Hon'ble Secretary to the Government of India, Ministry of Home Affairs, Department of Home, 113, North Block, NEW DELHI - 110 001.
3. The Director General, Civil Defence, East Block VII, Level-7, R. K. Puram, NEW DELHI- 110 001.
4. The Fire Adviser to the Government of India, East Block VII, Level-7, R. K. Puram, NEW DELHI- 110 001.
5. The Director, National Fire Service College, MHA, Government of India, Civil Lines, Palm Road, NAGPUR- 440 001 .

No.5-8/2010-NDRF
 Government of India
 Ministry of Home Affairs
 (Disaster Management Division)
 3rd Floor, 'C' Wing, NDCC-II Building,
 Jai Singh Road, New Delhi
 Dated, the 21st July, 2015.

To

Shri M.V. Deshmukh,
 President,
 National Association of Fire Officers,
 3/13 Tardeo Air Condition Market Bldg.,
 Dadasaheb Vichare Road,
 Tardeo, Mumbai – 400034.

Sir,

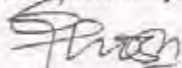
I would like to refer your letter dated 01.07.2015 addressed to the Union Home Minister, Government of India regarding creation of National Disaster Response Force (NDRF) Academy at Nagpur by merging of National Fire Service College (NFSC), Nagpur and National Civil Defence College (NCDC), Nagpur.

2. I would like to inform you that the Government of India has raised National Disaster Response Force to provide specialized response to disaster or disaster like situation. Over a period of time, NDRF has grown by its strength and stature. The growing need for providing specialized training to NDRF personnel in a dedicated institute was being felt for some time. The Government has already created the National Fire Service College (NFSC), Nagpur and National Civil Defence College (NCDC), Nagpur for providing training to fire service personnel and civil defence personnel respectively. The resources at existing institutes at NCDC, Nagpur and NFSC, Nagpur are remaining underutilized for a period of time. As the basic objective of all these institutes is to provide training on response to various hazards, the synergy of providing training to fire service, civil defence and NDRF personnel under a common umbrella organization was mooted. Considering all above aspects, the government has decided to create a combined Academy i.e. "National Disaster Response Force Academy" to fulfill the training requirement of Fire Services, Civil Defence and National Disaster Response Force/State Disaster Response Force personnel.

3. The training of fire services will continue in the existing campus, rather it will be more strengthened & professionalized under the new integrated NDRF Academy.

4. Further, I would like to point out that NSFC and NCDC shall continue with their training schedules without any hindrances and will continue to provide training to fire service personnel of State Governments. I would like to assure you that creation of combined NDRF Academy by merging NFSC & NCDC, Nagpur will no way dilute the objective of training of fire service personnel of State Governments at the Central level.

Yours faithfully,



(Goutam Ghosh)
 Director (DM-I)
 Tel No.23438123

THE 5 MOST UNDERRATED FIRE-FIGHTER EXERCISES

Physical training and being in shape is vitally important, just as important as sharpening your mental skills.

Around most firehouse workout rooms, there seems to be a constant focus on the newest, flashiest and trendiest workout regimen or exercise. But, in pursuing the new, the cutting-edge and the fresh, we can sometimes overlook the basics. There are five underrated Fire-fighter exercises that Fire-fighters have a tendency to skip or forget to integrate into their workouts.

Granted, these exercises will work every muscle in your body, but they don't focus on just the biceps, abs or chest specifically. One thing is certain, though: These underrated exercises work the muscles that are essential for the demands of the fire-ground.

Crawling

Crawling—the movement you used to do as a child could be the one thing that can improve your strength, mobility and performance on the fire-ground. Most of us don't think of crawling as an exercise (or we just don't think about it at all), but consider how integral a movement this is on the fire-ground, as we navigate through a building to search for a trapped occupant.

Incorporate crawling after your next strength training or cardio session. Think of crawling like it's a traveling core exercise. You have to maintain the same rigid, neutral core you would while in a plank position, but with the crawl, you're moving forward, backward and side-to-side. All you need to do to feel the burn in your shoulders, quads and core is get down on your hands and feet and move around for a couple sets of 20 to 30 seconds.

How to do it: To use nearly every muscle in your body, try to crawl (on your hands and toes) in different directions: forward, backward and sideways. Additionally, you can work through these crawling movements slowly and with a weighted vest for strength, stamina and flexibility, or you can do them explosively for speed, power and agility. Try to crawl for three sets of 20 to 30 seconds at the end of your workout.

Farmer's Carry

One of the basic principles of the fire-ground is to make sure you always have a tool in your hand. Some of the tools we carry are lighter, and some can weigh almost 100 pounds. Regardless of weight, carrying is a movement that requires good grip strength,

core stability and balance—and it should be an exercise in every Fire-fighter's workout.

While simple to perform, the Farmer's (or Suitcase) Carry exercises are among the most challenging exercises you'll ever try. How to do it: Grab some weights, sandbags, kettle bells or something heavy. Then stand up straight and walk for a predetermined distance or time. There are variations related to how you carry the weight. It is suggested to start with the Suitcase Carry, meaning the weight is at your sides, and then progress to shoulder carry, where the weights are at your shoulders. Use caution when picking up and putting down the weights. One of the biggest mistakes seen is people using poor lifting technique. Finally, make sure to keep your head and shoulders back at all times. Dropping your head or rounding your shoulders will increase the risk of injury and eventually limit your performance. Walk using a normal stride at first then shorten your steps as you become tired to help maintain proper technique. Try the Farmer's Carry for 2 or 3 sets of 30 to 90 seconds at the end of your next workout.

Deadlift

The deadlift is probably the most popular of the underrated exercises, so why did it make the list? The deadlift can be an intimidating exercise, so many Fire-fighters have a tendency to skip it or substitute the leg press for it. If you break down the mechanics and motion of the deadlift, it's easy to recognize that as Fire-fighters we perform the deadlift many times a shift and don't realize it: grabbing a cot, lifting hose, carrying saws and tools, etc. Deadlifts are a part of our job.

How to do it: Nothing is more natural to the human body than the task of lifting something from the ground. The principal idea of the deadlift is very simple—pick up a barbell or dumbbells off the ground and set it or them back down.

Drags

Pulling or dragging things around is difficult, which is why most of us avoid doing it. Like crawling, this movement isn't usually thought of as an exercise. However, pulls or drags are things we do on the fire-ground or on a rescue scene, so it only makes sense that we integrate this movement into our workout routine.

The benefits of dragging as an exercise are numerous. Depending on the size of the

object and distance, dragging can work your cardiovascular recovery and challenge your overall conditioning.

How to do it: How and what to drag depends on the room and objects you have available. One of the easiest (and most common) items to drag is a large tire. You can also change the direction and angle of your drags—forward, backward and sideways—which challenges your muscles in different planes of motion (like that on the fire-ground). It is recommended dragging a mid-size tractor tire (100 to 250 pounds) over a short distance. You can easily tie some webbing around the tire to use as a handle/harness, or just use the edge of a sledge. The biggest point to remember when performing a drag is to maintain good posture and focus on engaging the muscle of the core.

Glute bridges

The bridge is a common exercise in the rehabilitation field but not a mainstream exercise. Fire-fighters use the glutes for almost every fire-ground operation, which makes them one of the most important muscles in the body to train. The glutes have also been described as the brain of the lower body because they control everything that happens in your legs. What's so great about the glute bridge is that it's simple and versatile, and everyone who sits on their butt for hours or wants to be stronger and more powerful stands to benefit from it.

How to do it: The classic glute bridge is great to perform anytime, especially toward the start of a workout. Here are the basics of how to do a glute bridge. Begin by lying flat on the floor in supine position with knees bent, feet flat, toes pointing straight ahead and arms by sides. Activate your core by drawing the navel toward the spine and squeezing the glutes. With core engaged and glutes squeezed, push through your heels and lift your hips off the ground to form a straight line between your knees and shoulders. Hold and slowly return back to the floor, touching the floor momentarily then repeat. Try to perform 1 or 2 sets of 10 to 15 reps.

Wrap-up

Here's hoping these five exercises will help you break out of an exercise rut or plateau. Incorporating them into your workout program will help you become a better fire rescue athlete.

(Source: www.firehouse.com)

INDIA FIRE & SECURITY YATRA 2015 (IFS Y)

The Fire & Security Association of India (FSAI) had organised the Indian Fire and Security Yatra (IFS Y) which included road shows at 11 destinations, across the country. The objectives of IFS Y includes showcasing cutting-edge technologies, new products & services from leading OEMs; dissemination of knowledge amongst the stakeholders & thought leaders; initiation of mutually beneficial partnerships and strengthening awareness about fire safety and security. It was for the first time in the history of FSAI that Underwriters Laboratories (UL) joined this event as Knowledge Partner and as a part of their association, technical presentations were made by its senior personnel. Each of the eleven road shows were organised at prime properties of the respective cities, with a full day programme, embedded with key note addresses, technical

presentations, panel discussions, product demonstrations and one-to-one interactions. This exhaustive programme won laurels from one and all, as it helped delegates in gaining knowledge on new products & technologies, interaction with professionals, and develop fellowship with professionals. At the same time, the sponsors were also satisfied with quality footfalls at each destination. Not to miss, FSAI received an exposure, which resulted in enrolment of new members. In a nutshell, IFS Y 2015 created a win:win situation for all the stakeholders. Needless to say, such a massive exercise would not have been successful and meaningful, but for the tireless efforts of FSAI teams at national and chapter levels; faith and confidence of industry partners and participation by domain experts and government officials for sharing their knowledge with delegates.



► Keynote address by Mr. M. V. Deshmukh, Fire Advisor, Maharashtra Fire Services, Mumbai at IFS Y 2015 Mumbai



► Mr. S. S. Warick, Director, Maharashtra Fire Services addressing the gathering at the IFS Y 2015 Partners Award Night



>> IFS Y – 2015: DELHI

THE DELHI EVENT WAS HELD ON 18TH SEPTEMBER 2015 AT EROS HOTEL. THE FULL DAY EVENT GENERATED HUGE INTERESTS AMONG VARIOUS GOVERNMENT OFFICIALS AND INDUSTRY PLAYERS INCLUDING END USERS.



► Guest of Honour Sri. A. K. Sharma, Director, Delhi Fire Service addressing the gathering at IFS Y 2015 New Delhi

The conference was inaugurated by Dr. Sudhir Krishna, Chairman BIS Smart Cities Sectional Committee and former Secretary, Ministry of Urban Development, Government of India. DK Shami, Fire Advisor to Government of India – Ministry of Home Affairs and A.K. Sharma, Director, Delhi Fire Services were Guest of Honours and were also recognized for their immense contribution to safety by award of Life Long Honorary Memberships to FSAI. Pankaj Dharkar, President – FSAI and Ajit Raghavan, Secretary – FSAI also attended the inaugural session. Dr. Krishna made remarkable impression on the audience clarifying the focus area for further urban development in India while providing useful data on the spread of Indian population among city and rural sectors. Dr. Krishna also provided expedient comments about the need of security and safety in future smart cities and all other present developments as well. Shami emphasized about need of regular improvement and implement of design codes. He also commented about the possibility of FSAI playing the role of a critical bridge between the government and private sector. Sharma shared details of the ongoing situation in fire safety, need to build self-reliance and some future possible developments.

The panel discussion on 'What challenges are there in Smart Cities with re-

spect to Security & Surveillance' was moderated by Garry Singh, MD - IIRIS Consulting. The panel had members from retired government officials, corporate users and OEM/Consultants. The panel concluded the following points as need of the present hour:

- Possibility to create safe zones at smaller level rather than focussing only on safe cities on larger framework
- Need to standardize and codify security equipment and its uses
- Promote Public Private Partnership
- Time to seek inputs of uses and their expectations



► Guest of Honour Mr. D. K. Shami, Fire Advisor to Govt. of India - Ministry of Home Affairs addressing the gathering at IFS Y 2015 New Delhi

- Judicious use of technology suited for Indian conditions with an eye on cost of implementation and maintenance
 - Sandeep Goel, Founder Director – Proion Consultants moderated the second panel discussion on 'How We Can Create & Manage Tall, Smart & Safe Buildings'. A.K. Sharma, Director – Delhi Fire Services and many other top professionals were part of the panel. The panel empathized need of the following issues:
 - Need of high excellence and commitment on safety design matters
 - Raise the awareness on the critical aspect of understanding the requirement of fire safety and moreover effective management for ensuring safety of the occupants
 - The tall buildings in itself pose engineering and safety challenges which are to be addressed through engineered approach and consistent monitoring of the systems upkeep
 - Requirement for all bodies to work together to reach correct results
- The day also included new technology and futuristic products presentation from top companies such as United Laboratories, Geberit, Hikvision, Watchdog Security, Blazemaster, Monsher, Newage Industries, Nohmi, UTC, Siemens and Honeywell. Presentations were also made by teams of Fire India 2015 and Acrex India 2016.
- The event provided a great opportunity to the policy makers, consultants, manufacturers and users to interact and provide crucial road map points for future. ■■

AHMEDABAD

>> IFSY – 2015 : AHMEDABAD

THE INDIA FIRE & SECURITY YATRA – 2015 AT AHMEDABAD, HELD ON 19TH SEPTEMBER 2015 AT HOTEL HYATT, RECEIVED AN OVERWHELMING SUPPORT OF 303-DELEGATES WITH MORE THAN A FULL HOUSE KEEPING THE SPEAKERS, SPONSORS AND ASSOCIATES BUSY THROUGH THE DAY.

It was a jammed packed hall, at Hyatt-Ahmedabad, when the welcome address of IFSY 2015 Ahmedabad was delivered by the Gujarat Chapter President, Nimit Sheth. He emphasized the need of this IFSY 2015 Yatra across 11-cities & importance of its core topic, as it was for facilitating Prime Minister, Narendrabhai Modi's dream project of having 100 Smart Cities in India. He briefed that to succeed the dream of "Tall, Smart, Safe Buildings for Smart Cities" and to aid the dream, FSAI pledge their full support. For Tall & Smart Buildings in Smart Cities above 70 mtrs to 250 mtrs, special technology & infrastructure is required and for that appropriate policies, norms and standards should have to be put in place so that when push comes to shove, India as a nation can propel forward while protecting billions of lives that live in it and giving them a safe, secure & better standard of living.

The Inaugural Address was given by National President Pankaj Dharkar, he explained in detail the background and vision of IFSY Yatra and its theme each year, and ensured the delegates that each edition will bring in novelty, to pass on benefits to professionals and end users and the country at large. He explained

about various initiatives of the Chapters across India and appealed to delegates to give their support for better dissemination of results. He also informed that all stakeholders like Govt. officials, PSU's, corporates, civil engineers, architects, consultants, developers, manufacturer, contractors etc. all are brought under a common platforms and there is discussion, debates and idea sharing and technology presentation to come out with a better & broad based thoughts, norms & standards for Fire Protection Challenges & Security Surveillance Challenges to come in Smart Cities.

The Chief Guest B.K.Thacker, IAS, (Director State Fire Prevention Services – Govt. of Gujarat) informed in his speech of implementing of Fire Act 2013 in State of Gujarat to its best & also invited FSAI to work in tandem with his department as per support needed for benefit of people at large.

The Chief Guest & Keynote Speaker A.K.Singh IPS, (Addl. DGP, Govt. of Gujarat) made an elaborate presentation on the steps needed to be taken in the direction of making city not only a smart city but also its citizen safe. He shared his experience and guided all on the security challenges and threats being faced in today's world and the need of an hour.

He called upon FSAI to work in tandem with their concern departments in sharing knowledge and educating people for better safety-security of Smart Cities at large. Also discussion on better technology, norms and putting of standards in place as per challenges faced by Smart Cities was discussed.

The Guest of Honor & Keynote Speaker M.V.Deshmukh (Fire Advisor, Maharashtra Fire Service, Govt. of Maharashtra) delivered a wonderful speech about the fire challenges in Tall, Smart & Safe Buildings in Smart Cities. He shared his vast experience as a Mumbai Chief and the kind of challenges in fire protection that tall buildings and Smart cities would face and its solutions. He called upon all stakeholders to work together to come out with the best of solutions and its positive implementation.

During the event, the Student Chapter of FSAI Gujarat Chapter was launched in presence of all Chief Guests & Guest of Honor with the MOU signing of FSAI & School of Fire Technology, Sanand, Ahmedabad for giving benefits to the student studying Life Safety. FSAI Gujarat Chapter have planned to also discuss this initiative with other leading Institutes like IIT-Gandhinagar, LD-Engineering, Nirma-College etc for their



▶ IFSY 2015 Ahmedabad Audience

student's benefit and interact with students and discuss about the opportunity in Life Safety domain..

There was a Panel discussion on 'Security and Surveillance Challenges in Smart cities', which was quite interactive and was Moderated by K.Nityanandam- IPS-Retd (Ex. Addl DGP & Home Secretary, Gujarat State) along with Panelist Ashish Dhakan,(CEO, Hikvision), Hiren Patel (Leading Architect), Jaxay Shah,(MD – Savvy Developers), Nilay Patel (MD- Deep Builder) Vijay Singh (GM GIFT City, Gandhinagar) they all had an in-depth discussion of not only the problems but also the solutions and challenges pertaining to security challenges in tall &



▶ Chief Guest Mr. B. K. Thacker, IAS, Director, Gujarat State Fire Prevention System, Govt. of Gujarat addressing the IFSY 2015 Ahmedabad Gathering

smart buildings in Smart Cities.

There was also a Panel Discussion on "Fire Protection Challenges in Smart Cities" being Moderated by Abhay Purandare, Fire Consultant along-with Panelist M.F.Dastoor (Chief fire Officer- Ahmedabad), Pavan Bakeri , (MD,-Bakeri Group) , Chitrak Shah – (MD, Shivalik Projects), Satheesh Kumar (GM Reliance Industries) and Bharat Sharma – (GM – UTC), they had in-depth discussion on the convergence of technology for not only making tall buildings smart but also safe for occupants. The important factors of the codes in force, implementation and maintenance of safety installations, and their convergence with building automation were discussed.

The technology exhibition was visited by all the delegates and was found to be very useful. The exhibitors, on their part, expressed happiness about the seriousness of visitors. The technical presentations by associates kept audience attention and provided a suitable platform for extensive knowledge sharing.

The customary vote of thanks was presented by the Gujarat Chapter Secretary, Mukesh Shah. He thanked chief guests, guest of honor, speakers, moderators, panelist, delegates & specially sponsors for their overwhelming support & making this event IFSY 2015 a great success. ■■

CHENNAI

>> IFSY 2015 - CHENNAI

THE ONE DAY EVENT IN CHENNAI ON AUGUST 6TH AT HYATT REGENCY , CHENNAI WAS WELL ATTENDED BY MORE THAN 200 REGISTERED GUESTS FROM ALL SECTORS LIKE SYSTEM INTEGRATORS, MANUFACTURERS, ARCHITECTS, CONSULTANTS AND END USERS. THE CHENNAI EVENT HAD THE PRESENCE OF THE NATIONAL PRESIDENT, SECRETARY AND TWO NATIONAL PAST PRESIDENTS OF FSAI.

The registration for the event started at 9:10 am and by the start of the event at 10 am, there were 130 registered guests. The chapter President Rakhi Deepak welcomed the gathering followed by Presidential Address by the National President Pankaj Dharkar.

The Chief Guest Gladson Bhaskaran, Head EHS , Saint Gobain and CII convenor for Renewable Energy, delivered his message on " Smart City My Perception". He conveyed a smart city as

- S** – Simple to access & scalable to deliver
- M** - Maximum utilisation & minimum wastage
- A** – Automated and analytic
- R** – Response time & responsibility
- T** – Technology investment

There were eight technical presentation along with two interactive panel discussions.

The Security Panel Discussion was moderated by Shivaramkrishnan.V, Principal Consultant, S&S Consulting Engineers on the topic "Security Challenges in Smart City". The elite

panel had perception of End User (T.S.Thiruppathy, AGM - TRIL INFOPARK LTD), Manufacturer (Ravishankar, Director - SHLARA Automation), Consultant (Arun Moorthy, Director QPro consulting) and System Integrator (Col. Raj Kumar, Sr. Regional Manager, Globe Detective Agency).

A special keynote address was given by Padmashree Prof. Ashok Jhunjhunwala, IIT Chennai, Advisor to PMO. He stressed on the need to have technology updates and manufacturing in India for the fire and security products.

The Fire Panel Discussion was moderated by Ajit Raghavan, Joint MD, Nohmi Boshai India Pvt Ltd on the topic "Fire System Installation Practices and Maintenance". The elite panel had perception of Insurance Agency (K.A.Yeshwanth, L&T Insurance), Manufacturer (Rajasekaran, MD Ravel Electronics), Consultant (S. Arul) and Architect (C. Venkatesu, CRN Associates).

The event concluded at 5 pm with a customary Vote of Thanks by the chapter secretary Arunkumar Balachandran. ■■



▶ Inaugural Address Mr. Pankaj Dharkar, National President, FSAI at IFSY 2015 Ahmedabad



▶ Guest of Honour Mr. M. V. Deshmukh, Fire Advisor, Maharashtra Fire Services, Mumbai addressing at IFSY 2015 Ahmedabad



▶ Keynote Address by Mr. A. K. Singh, IPS, Additional DGP, Govt. of Gujarat at IFSY 2015 Ahmedabad



>> IFSY – 2015: VIZAG

THE IFSY 2015 VIZAG WAS ORGANIZED AT NOVOTEL HOTEL ON 29TH AUGUST 2015 AND WAS ATTENDED BY MORE THAN 160 DELEGATES-ARCHITECTS, CONSULTANTS, CONTRACTORS, BUILDERS AND PROFESSIONALS. THERE WAS ALSO A PRODUCTS EXPO OF VARIOUS MANUFACTURERS OF FIRE-FIGHTING, SECURITY SYSTEMS LIKE HONEYWELL, HIK VISION, UNITED TECHNOLOGIES, SHALARA AUTOMATION, NOHMI, UL, NEWAGE INDUSTRIES, AND OTHER LEADING PLAYERS.



► Inaugural Address by Sri. K. Hari Babu, Hon'ble Member of Parliament, Visakhapatnam at IFSY 2015 Visakhapatnam

The President, FSAI Vizag Chapter, B. Madhu welcomed the gathering and explained various objectives of FSAI and Vizag Chapter's contribution taking forward the same for the benefit of all the members and professionals.

The President, FSAI Vizag Chapter, B. Madhu welcomed the gathering and explained various objectives of FSAI and Vizag Chapter's contribution taking forward the same for the benefit of all the members and professionals.

The FSAI National President, Pankaj Dharkar said the Yatra with reputed companies participating was touring all the 11 Chapters of the association. In a major step forward, an MOU was signed with the Council of Architecture to introduce fire safety solutions as a compulsory subject in the course.

The Chief Guest of the day, K.Hari Babu, Hon. Member of Parliament, Visakhapatnam, in his address said with Visakhapat-

nam being short-listed in the first round of smart cities and also selected for development with the US collaboration, creating safe buildings was an imperative and FSAI could play a role. Stressing the importance of developing human resources and skill development for fire safety, K. Hari Babu said he will take up the issue of introducing it with National Skill Development Corporation. He said the successful replacement of 92,000 conventional streetlights with LED Lamps in Visakhapatnam was an example to be followed in smart cities as energy conservation was equally important.

While delivering his key note address on High Rise and Tall Buildings in smart cities, M.V.S.Murthy, President, GITAM University, Visakhapatnam & Member Of Legislative Council of Andhra Pradesh underlined the need for third party certification of safety of buildings apart from builders and the government. The use of low quality material was leading to fire and it needed to be checked. With cellars being encroached upon and converted into kitchens, safety appeared to be a mirage in the city he said. Fire safety education was also important and a course should be introduced in engineering he added.

The Keynote Address was delivered by Amit Garg, IPS, Commissioner of Police, Visakhapatnam. In his address he explained security of various applications and securing data as being equally important while providing online services to public in a smart city. Protocols and standard operating procedures should

be in place and the government agencies should give importance to security aspect of applications. He said State Data Research Centre was the offing and would help in prevention of various agencies penetrating websites.

With more and more services offered online, there was a conflict of interest between better functioning of systems and securing data. There should be a robust system to check fraud with a lot of online trading taking place as the city becomes smart. Also there should be a protocol on who should have access to what data and a backup plan, he said pointing a recent instance of tampering with data in the issue of birth certificate.

The municipal corporation's core IT team should be strengthened along with smart city projects. He also said total logistic support including other agencies with power, connectivity and communication system was required for initiatives to work. Recalling his experience at the helm handling traffic in Hyderabad, he said 20 per cent of surveillance cameras did not work. This was true even in Visakhapatnam with connectivity problems for vehicle tracking and passport verification with tabs. He spoke on the recent initiatives for passport verification, i-click kiosks and Abhaya app.

As the city prospered economically and socially it might become vulnerable to urban terrorism. The city police will soon have a cyber crime police station in the place of the present Cyber Crime Investigation wing, Right now the cyber crime investiga-



► Lok Sabha Member Dr K Haribabu speaking at 'India Fire and Security Yatra-2015' workshop held in Visakhapatnam on 30 August 2015

tion wing was not well equipped and faced resource & manpower limitations. The draft GO had already been issued. Soon the government order granting the setting up of the cyber police station would be issued, he said.

The panel on 'Security and surveillance challenges in smart cities' was quite interactive, and saw in-depth discussion of not only the problems but also the solutions. Challenges pertaining to access control, identification, surveillance and specially analysis of data and others were discussed. It was moderated by K. Shankar, Director, e-Zone Security Solutions India Pvt Ltd. The Panelists were Ravi Shankar, Director, Shalara Automation; Ravi Chennupati, Chairman, e-Zone Security Solutions India Pvt. Ltd., Hyderabad and Ashish Dhakan, Managing Director, HIK Vision.

The FSAI Honorary Memberships were given to . K.Hari Babu, Hon. Member of Parliament, Visakhapatnam, i Amit Garg, IPS Commissioner of Police, Visakhapatnam, J. Padma Janardhan Reddy, Chief Electrical Inspector to Govt. of AP & Mavuri Venkata Ramana, Chairman & Managing Director of CMR Group.

In his Keynote Address, J. Padma Janardhan Reddy, Chief Electrical Inspector to Govt. of AP stressed on the need and importance for following standard practices of electrical installations using Earth leakage circuit breakers and other wiring standards as per NEC 2011 to avoid electrical fires. The ensuing panel discussion was moderated by V.Srinivas, Synergy Consultants & Chairman of FSAI Learning, Training & Development Committee. The Panelists were J. Padma Janardhan Reddy, Chief Electrical Inspector,

Govt of AP; K.Leela Prasad, MEP consultant and Founder President of FSAI Vizag Chapter and Pankaj Dharkar, MEP Consultant and National President FSAI.

The panelists mainly discussed and highlighted the causes of electrical fires due to improper Installations carried out by unskilled technical manpower. Not only that, not following the standard electrical gadgets, earth protecting devices a lot of fire accidents were taking place causing property loss and loss of human lives. The discussion stressed on the importance and need on creating public awareness for using Earth Leakage circuit breakers and standard earthing practices. The products expo stalls were visited by all delegates. The whole program was anchored by Dominic, FSAI National Honorary General Secretary and Chapter Secretary Rajagopal Reddy proposed Vote of Thanks. ■■



>> IFSY – 2015: HYDERABAD



► Keynote address by Sri. Somesh Kumar, IAS, Commissioner, Greater Hyderabad Municipal Corporation at IFSY 2015 Hyderabad

The Chief Guest of the day, Somesh Kumar, IAS, Commissioner and Special Officer, Greater Hyderabad Municipal Corporation made an elaborate presentation on the

IT WAS A PACKED AUDITORIUM IN ASIA'S FINEST CONVENTION FACILITY, HICC, HYDERABAD, WHEN THE WELCOME ADDRESS OF IFSY 2015 HYDERABAD WAS DELIVERED BY THE CHAPTER PRESIDENT, NARAYAN BHOSEKAR. HE EXPLAINED THE VARIOUS INITIATIVES OF THE CHAPTER AND APPEALED TO DELEGATES TO CONTINUE THEIR ATTENTION FOR BETTER DISSEMINATION OF RESULTS. IN THE PRESIDENTIAL ADDRESS, PANKAJ DHARKAR HAD EXPLAINED IN DETAIL THE BACKGROUND AND VISION OF IFSY, AND ENSURED THE DELEGATES THAT EACH EDITION WILL BRING IN NOVELTY, TO PASS ON BENEFITS TO PROFESSIONALS AND THE END USERS. CHAIRMAN OF LEARNING, TRAINING AND DEVELOPMENT COMMITTEE, V.SRINIVAS PRESENTED THE VARIOUS INITIATIVES IN THAT DIRECTION.

steps taken in the direction of making Hyderabad not only a smart city but also citizen safe. Of particular relevance was an initiative to brand and label buildings as 'Fire unsafe' where they fail the compliance of fire safety. He called upon FSAI to work in tandem with the corporation to reach the benefits of technology and help the corporation achieve higher levels of compliance, in raising the bar of standards in civic facilities.

The panel on 'Security and surveillance challenges in smart cities' was quite interactive, and saw in-depth discussion of not only the problems but also the solutions. Challenges pertaining to access control, identification, surveillance and specially analysis of data and others were discussed. The audience paid rapt attention and made this very interactive. The

second panel on 'Creating and managing tall, smart and safe buildings' discussed the convergence of technology for not only making tall buildings smart but also safe for occupants. The important factors of the codes in force, implementation and maintenance of safety installations, and their convergence with building automation were discussed.

The exhibition was visited by all the delegates and was found to be very useful. The exhibitors, on their part, expressed happiness about the seriousness of visitors. The technical presentations by associates kept audience's attention and provided a suitable platform for extensive knowledge sharing.

The customary vote of thanks was presented by the chapter secretary, Prasad Raju. ■■



>> IFSY – 2015: KOLKATA

THE IFSY-2015 KOLKATA WAS ORGANIZED AT THE PARK HOTEL. THE TOTAL NUMBER OF ATTENDEES WAS MORE THAN 180. THE WELCOME ADDRESS OF IFSY 2015 KOLKATA WAS DELIVERED BY THE CHAPTER PRESIDENT, ASHIM MUKHERJEE. HE EXPLAINED THE VARIOUS INITIATIVES AND ACTIVITIES OF THE CHAPTER AND APPEALED TO DELEGATES TO CONTINUE THEIR PARTICIPATION AND TO CONTRIBUTE ACCORDINGLY FOR ACHIEVING THE ULTIMATE GOAL THAT IS TO BRING AWARENESS AMONG STUDENTS AND THE MASSES. IN THE PRESIDENTIAL ADDRESS, PANKAJ DHARKAR, FSAI NATIONAL PRESIDENT, EXPLAINED IN DETAIL THE BACKGROUND AND VISION OF IFSY. APART FROM THE NATIONAL PRESIDENT, NATIONAL SECRETARY AJIT RAGHAVAN AND NATIONAL TREASURER MS. KOYELI DUTT WERE ALSO PRESENT ON THAT DAY.



Chief Guest Janab Javed Ahmed Khan, Hon'ble Minister-in-Charge FES, Civil Defence & Disaster Management, Govt. of West Bengal addressing the IFSY 2015 Kolkata gathering.

The Chief Guest of the event, Janab Javed Ahmed Khan, Hon'ble Minister-in-Charge, Department of Fire and Emergency Services, Disaster Management, Civil Defence, Govt. of West Bengal made an elaborate presentation on the steps taken in the direction of making Kolkata a safe and smart city.

The Keynote Address on Security in Smart Cities was given by Dr. Tinku Acharya, Founder and Managing Director of Videonetics Technology Private Limited, Kolkata, India. He is an inventor, entrepreneur, and internationally acclaimed technologist. He is inventor of more than 150 granted patents in electronic imaging, data compression, multimedia computing, computer vision, intelligent video, and VLSI architectures. The audience appreciated his speech very much.

The Keynote Address on Fire Safety in Smart Cities given by D. K. Shami, a member of IFE UK and a fellow of IFE, India. He has been in the Industrial, State and Central Fire Services including Advisory role for Government of India for the last 28 years. He has been a recipient of the



Mr. Jogesh Chatterjee, IPS DG (Retd.), WBFES, addressing the IFSY 2015 Kolkata gathering

address delivered by him was full of knowledge and information.

The panel on 'Security and surveillance challenges in smart cities' was quite interactive, and saw in-depth discussion of not only the problems but also the solutions. The challenges pertaining to access control, identification, surveillance and specially analysis of data and others were discussed by

Moderator, Tuhin Bose, VP & CTO, Videonetics Technology Pvt. Ltd. The panelist were Rajib Mondal, Founder & CEO, Integrated Infrastructure Solutions, Consultant; Ajay Kumar, Chief Signal Engineer at South Eastern Railway; Debjit Mukherjee, Infrastructure Management and Services Group, ICICI Bank; Debabrata Choudhary, Founder Director, NIS Group, System Integrator; S.S. Rajput, MD - Security Engineers Pvt. Ltd.

President's Fire Service Medals for Meritorious Services and for Distinguished Services. Shami has been Chairman, Co-Chairman and Member of various Committees of Bureau of Indian standards, Oil India Safety Directorates and contributed in development of Standards and Codes of Practices. The keynote



Inaugural Address by Mr. Pankaj Dharkar, National President, FSAI at IFSY 2015 Kolkata

The Panelists were Dilip Chatterjee, Architect, IIA; Gourprasad Ghosh, Director WBFES; P.K. Banerjee, President, Technical, Forum Group; Sekhar Dey, Fire Consultant and Preetam Basu, Fire Consultant.

The discussion and deliberation were very technical and academically very helpful for the end-users, architects and installers. The audience paid attention and made this very interactive. The state of the art technology and the latest products and systems were presented by the exhibitors which was acknowledged and appreciated by the audience. The exhibition was visited by all the members and non-members delegates and was found to be very useful. The exhibitors were very happy about the seriousness of visitors.

The vote of thanks was presented by the chapter secretary, Ranjan Kumar Dey.

The second panel on "Fire Safety in Smart Cities - Installation & Practice" was also interactive and informative. It was moderated by D.K. Shami, Fire Advisor, Ministry of Home Affairs, Govt. of India and D.P. Biswas, Addl. Director General (Retd), Fire & Emergency Services, Govt of West Bengal.

THE OBJECTIVES OF IFSY INCLUDES SHOWCASING CUTTING-EDGE TECHNOLOGIES, NEW PRODUCTS & SERVICES FROM LEADING OEMs; DISSEMINATION OF KNOWLEDGE AMONGST THE STAKEHOLDERS & THOUGHT LEADERS; INITIATION OF MUTUALLY BENEFICIAL PARTNERSHIPS AND STRENGTHENING AWARENESS ABOUT FIRE SAFETY AND SECURITY.

The Benefits (and Dangers) of Using Social Media in the Fire Services

LIKE IT OR NOT, SOCIAL MEDIA IS HERE TO STAY. IT'S A TOOL FIRE DEPARTMENTS CAN USE TO BUILD GOODWILL WITHIN THEIR COMMUNITIES AND IMPROVE HOW THEY COMMUNICATE WITH THE PEOPLE THEY SERVE, HOWEVER, IT'S ALSO SOMETHING FIRE DEPARTMENTS SHOULD ENTER INTO STRATEGICALLY.



So how should fire departments approach social media, what is the importance of developing policies (yes, that's multiple policies), as well as best practices to avoid some of the horror stories we hear on the news.

Social media use is exploding and what a valuable tool technology is offering us if we're willing to embrace it. One of the reasons departments don't embrace social media is because many fire leaders aren't comfortable with technology. In very general terms, there tends to be two groups: an older, more conservative and less tech-savvy group; and a younger, more liberal, high-tech group. For the younger group, social media is just another way of communicating, but for the older group it's often a new and slightly daunting form of communication.

And there's issues with both groups. The older generation tends to avoid social media, whereas the younger generation often takes it too far. The younger generation is coming up with level of comfort with technology that often collides with their job responsibilities. There were several case studies presented during a webinar that featured fire-fighters who had been reprimanded for their (mis)use of social media - some were understandable, others seemed ludicrous. So, what was the common denominator for many of these cases? Well, it was the fact that none of those involved tried to hide their identity. These fire-fighters made no effort to disguise their identity. People didn't make an effort, which was wrong.

The consequences of many of these incidents have reached far beyond punishing the individual, too. In several cases, fire chiefs have been asked to resign and their reputation has been damaged. When incidents make it to the media spotlight, it damages the reputation of the department as well.

DEVELOP A POLICY - AND REVIEW IT OFTEN!

Fire departments often need multiple policies. First of all, it's critical to have a digital imagery policy, which is about 50% of the solution. Digital imagery spurs other issues such as public records laws (if you're on-duty and take a picture, is that now considered a public record?). Also, there may be the possibility that that picture may be used as evidence, so then there's laws about what you must do to retain those images.

The other policies should focus on balancing employer rights with employee rights. In terms of employee rights, there are three broad categories that must be addressed: privacy/liberty rights, first amendment rights, collective bargaining rights.

While there are model policies for fire departments, fire departments must develop policies that are specific to them. It's also important to regularly review your social media policy because things change so fast. Perhaps every six months. There are so many moving parts in a policy and you need to update it every year and often sooner than that.

Be sure your policy addresses how your department will handle the not-so-glowing comments it's bound to get. Remember, social media is an interactive tool. Platforms like Facebook enable the public to post comments, good and bad, on your site. It's important to talk about how to best handle those situations.

If someone in the public posts something inappropriate on your site, who's responsible? There are restrictions on what content you're going to allow because at some point it's your Facebook account and to some extent you're responsible. You do have the responsibility to manage that well.

DON'T JUST WRITE IT, TEACH IT
But the work isn't done after the policy is

drafted. Besides a policy for digital imagery and social media, departments need to teach people and train them. There needs to be strong leadership in place to teach people about social media usage. Fire leaders need to address social media in recruit school and they need to lay out their expectations early.

The reality is, fire-fighters are on duty 24 hours a day and they represent the department and the city 24 hours a day. Even though many of these cases occurred while off-duty, fire-fighters and public employees are often held to a higher standard - that's just the reality of the job.

IF IT'S SO MUCH TROUBLE, WHY USE SOCIAL MEDIA?

Well, one doesn't really have a choice - he is involved whether he likes it or not. And, there are amazing opportunities to seize (really). Here are the big ones:

BUILDING GOODWILL WITHIN YOUR COMMUNITY

Social media presents fire departments an opportunity that they've never had before: The ability to communicate directly with the public. Fire departments are finding ways they can use Twitter and Facebook and the Internet to talk directly to the people they serve. The importance of building "reputation equity" and goodwill within community cannot be ignored. Social media is a way to inform those you serve about what you do to protect them.

SOCIAL MEDIA IS FREE (SORT OF)

Social media tools like Facebook and Twitter are free, but using them effectively might cost some money. For example, the importance of having a Public Information Officer who is experienced with social media. In today's difficult economic climate it may seem like a luxury for a department to have a PIO, but really, it's a necessity. Since you're building reputation equity it's important to have someone dedicated to this important effort.

ENHANCED AND DIRECT COMMUNICATION

This line of communication is important in good times and bad. In good times it's important to inform the public about what you do on a daily activity to keep them safe. In bad times, it's important to be able to structure a direct message to the public about the situation. No longer do fire departments have to rely on traditional news media to communicate with the people they serve - they can do it straight through social media and are able to better control the message.

Overall, social media should be viewed as an opportunity for fire departments, but it's something that needs to be entered into strategically, with forethought and policies to back it up.

So what's holding your department back?
(www.firerescue1.com)

TIANJIN BLAST PUTS SPOTLIGHT ON CHEMICAL INDUSTRY

CHINA'S STATE MEDIA ARE CARRYING CONFESSIONS FROM THE OWNERS OF THE COMPANY AT THE CENTER OF LAST WEEK'S DEADLY BLASTS IN TIANJIN AND APOLOGIES FROM LOCAL OFFICIALS IN THE NORTHERN PORT CITY.

ACCORDING TO REPORT IN THE BEIJING NEWS, ONE OF THE FIRST MEASURES YANG DONGLIANG APPROVED AFTER STEPPING INTO OFFICE WAS RELATED TO THE APPROVAL SYSTEM FOR BUSINESSES WORKING WITH HAZARDOUS MATERIALS.



Tianjin's mayor has apologized and said he bears responsibility as the city's top official for what happened. Two of the top shareholders of the company that runs the warehouses where chemicals exploded, Yu Xuewei and Dong Shexuan, who is the son of a late Tianjin port police chief, confessed in an interview with the Xinhua news agency that they used their guanxi, or connections, to obtain fire safety, land, environmental and safety certifications. Chinese media and the public have focused on how such dangerous chemicals

came to be stored in an area not far from residences. Just days after the blasts occurred, the anti-graft agency of the Communist Party of China announced that it was investigating Yang Dongliang, the head of the country's State Administration of Work Safety. Before rising to his current post, Yang served as a vice mayor in Tianjin for more than a decade.

According to report in the Beijing News, one of the first measures Yang Dongliang approved after stepping into office was related to the approval system for businesses working with hazardous materials. The measure states that such companies only need approval from port authorities to obtain a license. Industry sources say such de-centralization of authority is common in China. But while it is common, it may also have opened up the door for the kind of corruption that appears to have existed in Tianjin Port.

Industry practices under scrutiny

The deadly blasts, triggered by a fire and toxic brew of volatile chemicals, are raising questions about how effectively China enforces a long list of hazardous materials that are subject to tight regulations, and whether there are other locations with similar lax policies. The accident has raised concerns about violations of safety standards, from the testing and documenting of chemicals, to how such dangerous materials should be sealed, transported and



FILE - A FIREFIGHTER WALKS AMONG DAMAGED VEHICLES AS SMOKE RISES AMIDST SHIPPING CONTAINERS AT THE SITE OF EXPLOSIONS, AT BINHAI NEW DISTRICT IN TIANJIN, CHINA, AUG. 14, 2015.

The deadly blasts, triggered by a fire and toxic brew of volatile chemicals, are raising questions about how effectively China enforces a long list of hazardous materials that are subject to tight regulations

stored. "There are strict rules for each kind of hazardous chemical depending on its risk factor. Some have to be kept at specific temperatures and away from moisture. Some even underground," said one industry source.

Standards violated

At daily press conferences, officials have been hesitant to assign blame or even answer basic questions about the chemical industry's legal regulations, despite repeated questions such as how the company was allowed to operate within a kilometer of residential areas in violation of national zoning laws. Officials have confirmed that 700 tons of sodium cyanide was stored on the

grounds of the company at the center of the blasts when the disaster occurred, but have said less about how that violates standards that only 10 tons can be stored in one place at a time. At press briefings, authorities have hesitated to comment, citing that an investigation into the disaster is underway. The central government's State Council has established a task force to head up the investigation, which held its first meeting Wednesday.

Tight regulations, weak enforcement

The warehouse at the center of last week's explosions is located in Tianjin's Binhai New Area. As a newly developed economic district, the Binhai New Area has had tight regulations regarding the safety management of hazardous chemicals in place since it was set up in 2009, analysts noted. But how carefully those regulations are enforced is already in doubt. State media reported Tuesday the warehouse operator, Ruihai International, did not have a

AT DAILY PRESS CONFERENCES, OFFICIALS HAVE BEEN HESITANT TO ASSIGN BLAME OR EVEN ANSWER BASIC QUESTIONS ABOUT THE CHEMICAL INDUSTRY'S LEGAL REGULATIONS, DESPITE REPEATED QUESTIONS SUCH AS HOW THE COMPANY WAS ALLOWED TO OPERATE WITHIN A KILOMETER OF RESIDENTIAL AREAS IN VIOLATION OF NATIONAL ZONING LAWS.



FILE - A FIREFIGHTER WALKS AMONG DAMAGED VEHICLES AS SMOKE RISES AMIDST SHIPPING CONTAINERS AT THE SITE OF EXPLOSIONS, AT BINHAI NEW DISTRICT IN TIANJIN, CHINA, AUG. 14, 2015.

proper license to run a hazardous chemicals business from October of last year until June of 2015. Other safety violations have been reported in the past as well.

Analysts said that in addition to proper licensing, the training of personnel who handle such chemicals and the facilities where they are housed are also key. "When it comes to warehousing, there's got to be a separate design and location for storing hazardous chemicals as well as restrictions on a maximum storage quota or the strength of its walls," said Ivan Su, a logistics professor. Ruihai converted an ordinary warehouse and logistics center into a special storage facility for dangerous chemicals in 2012. It did not receive approval to handle dangerous chemical goods until April 2014, and that approval expired in October.



FILE - SMOKE RISES AMONG SHIPPING CONTAINERS NEXT TO DAMAGED VEHICLES AS FIREFIGHTERS TRY TO PUT OUT A FIRE AFTER EXPLOSIONS ON WEDNESDAY NIGHT, AT BINHAI NEW DISTRICT IN TIANJIN, CHINA, AUG. 14, 2015.



FILE - IN THIS IMAGE TAKEN FROM A VIDEO FOOTAGE FROM AP VIDEO, A WOMAN HOLDS UP A PHOTO OF HER SON, A MISSING FIREFIGHTER, OUTSIDE A HOTEL WHERE OFFICIALS HELD A DAILY MEDIA CONFERENCE IN NORTHEASTERN CHINA'S TIANJIN MUNICIPALITY, AUG. 16, 2015.

Influence peddling

So far, little is known about Ruihai's practices on site, but already a picture of callousness and corruption is beginning to emerge. Officials confirmed Wednesday that one of the key shareholders of the company was the son of a former police chief in Tianjin. "This is likely a case of influence peddling. The fact that they [Ruihai] were able to turn normal warehouses into those for the storage of hazardous chemicals shows that some strings had been pulled to secure governmental approvals to do so," professor Su said.

After China's Premier Li Keqiang vowed to get to the bottom of the devastation on Sunday, Chinese media have suggested that as many as eight safety regulators, including public security, quality supervision, environmental protection and transport departments are likely to be held responsible.

Not in my backyard

Public concern is growing following the blasts, not only about the spread of contaminants in the water and air, but also about similar warehouses and their distance from places of residence. In recent years, China's public has become increasingly vocal and the "not in my backyard" movement is well underway. Ding Xueliang, a professor of social science at Hong Kong University of Science and Technology, said the incident is likely to put a spotlight on the nation's warehousing sector. "Following the blasts, the warehousing sector will be under heavier scrutiny as opposition and protest used to largely target at pollution derived from the chemical reprocessing sector. From now on, more attention will be paid to the storage [of hazardous chemicals]," Ding said.

The fate of the warehousing sector will be taken into serious consideration, because Tianjin is central to a massive government project underway to turn Beijing, Tianjin and Hebei province into a mega-metropolis, housing a population of more than 110 million people.

(Source:voanews.com)

FIRE FIGHTING IN HOSPITALS

IN EACH FIRE DEPARTMENT'S RESPONSE AREA, THERE ARE LIKELY MANY DIFFERENT FACILITIES. FIRE DEPARTMENTS NEED TO CONDUCT PRE-INCIDENT PLANNING AND TRAIN REGULARLY FOR RESPONSES TO THESE FACILITIES. ONE OF THE MOST COMPLICATED TYPES OF FACILITIES THAT A FIRE-FIGHTER WILL EVER RESPOND TO IS A HEALTH CARE FACILITY. THIS ARTICLE WILL GIVE FIRE-FIGHTERS AN OVERVIEW OF HEALTH CARE FACILITIES AND SOME OF THE UNIQUE CHALLENGES THEY POSE.

The National Fire Protection Association (NFPA) 99, Life Safety Code®, defines a health care facility as, "An occupancy used for purposes of medical or other treatment or care of four or more persons where such occupants are mostly incapable of self-preservation due to age, physical or mental disability, or because of security measures not under the control of occupants." "Incapable of self-preservation" means that the individual would not be able to get out of the building by himself in case of fire. Health care occupancies, according to NFPA 101 are general hospitals, psychiatric hospitals, and specialty hospitals as well as nursing and convalescent homes, skilled nursing facilities, intermediate care facilities, and infirmaries in homes for the aged.

THE USE OF NFPA 101 IS AN IMPORTANT DISTINCTION FOR HEALTH CARE FACILITIES. WHILE MANY LOCAL AUTHORITIES HAVING JURISDICTION (AHJ) USE THE INTERNATIONAL BUILDING CODE AND FIRE CODE, IT SHOULD ALSO BE RECOGNIZED THAT SOME USE THE NFPA 1, FIRE CODE, AND NFPA 101 STANDARDS.

with the Centers for Medicare and Medicaid (CMS) conditions of participation, which requires compliance with NFPA 101. In addition to CMS hospital operators, refer to several other regulatory agencies when discussing the Life Safety Code. These agencies include the Joint Commission (TJC), DNV GL (an organization that provides deemed status for CMS), or health care facilities accreditation program (HFAP). These organizations are authorized by CMS to accredit hospitals as conditions of participations and to receive payments from Medicare and Medicaid. Thus, health care facility operators use NFPA 101 as an operating manual for their life safety systems.

laboratories with significant quantities of flammable and potentially hazardous chemicals, equipment that requires specialized response including, MRI and CAT scan machines, liner accelerators, full-service commercial kitchens, large complex central energy plants, hazardous materials storage, and so on. While this may seem like a great challenge it is important to note that fire-fighters will likely encounter a well maintained facility, with a very knowledgeable staff where fire protection features are in good working order.

The use of NFPA 101 is an important distinction for health care facilities. While many local authorities having jurisdiction (AHJ) use the International Building Code and Fire Code, it should also be recognized that some use the NFPA 1, Fire Code, and NFPA 101 standards. When responding to a health care facility, the operators will likely be much more familiar with NFPA 101 because they need to comply



(2) AN ELECTRIC BUSS DUCT.



(1) A STEAM HEADER. (PHOTOS BY AUTHOR.)

In addition to the problems posed by inpatient areas who cannot evacuate on their own, there are surgical procedures that cannot be stopped because of a fire. Other hospital challenges may include helipads, labo-

To understand the challenges that hospitals present, fire-fighters first need to understand the history of hospital fires. There are several NFPA studies and United States Fire Administration (USFA) articles on this topic which raise awareness of the issue.

According to NFPA, between 1980 and 1984—the earliest years of detailed national

data—fire departments across the country responded to an estimated average of 7,100 hospital fires annually, resulting in an average of five deaths per year. In the four-year period between 2006 and 2010, fire departments responded to an average of only 1,400 such fires that caused less than one death per year.

The implementation of smoking bans at many health care facilities has led to a significant decrease in the number of fires started by smoking materials, from a high of 35 percent between 1980 and 1984 to seven percent between 2006 and 2010.⁽¹⁾ Additionally, automatic sprinkler systems were installed in new construction, while retrofitting existing health care facilities has increased significantly in recent years. Between 1980 and 1984, automatic sprinkler systems were present in less than half of the reported hospital fires, whereas between 2006 and 2010 automatic sprinkler systems were present in four out of five reported hospital fires, and sprinklers were present in almost two-thirds of the fires.⁽¹⁾ As the data indicates, fires in hospitals still occur; however, much work has occurred to make hospitals safer.

THE IMPLEMENTATION OF SMOKING BANS AT MANY HEALTH CARE FACILITIES HAS LED TO A SIGNIFICANT DECREASE IN THE NUMBER OF FIRES STARTED BY SMOKING MATERIALS, FROM A HIGH OF 35 PERCENT BETWEEN 1980 AND 1984 TO 7 PERCENT BETWEEN 2006 AND 2010.⁽¹⁾ ADDITIONALLY, AUTOMATIC SPRINKLER SYSTEMS WERE INSTALLED IN NEW CONSTRUCTION, WHILE RETROFITTING EXISTING HEALTH CARE FACILITIES HAS INCREASED SIGNIFICANTLY IN RECENT YEARS.

involve having patients move to wheelchairs, while others will be moved in their beds. Inpatients that can be moved easily and do not require additional equipment such as ventilators and other monitors will be moved, and those inpatients that have the greatest risk of movement will be moved as a last resort. All hospitals are required to conduct one fire drill per shift per quarter; it is beneficial for fire companies to participate in these drills to understand how the hospital reacts to a fire emergency.



(4) NORMAL AND EMERGENCY POWER BREAKERS.

Even though the numbers of fires has significantly decreased, it is still very important for fire-fighters to understand how they need to operate at a fire in a health care facility. The biggest difference between fires in commercial and residential structures and fires is that in a hospital, the occupants are not able to leave the building on their own during a fire. Inpatient areas are protected by moving patients horizontally from one smoke compartment to another during a fire. This is accomplished through a systematic process that will vary at each facility. Most facilities will ask all visitors to evacuate as they would in any other type of occupancy.

Staff from other areas of the facility and from various departments will respond to assist in the movement of inpatients. Staff will then begin the process of moving inpatients as quickly as possible; this may

A health care facility with inpatients follows the NFPA 101 standard as “defend-in-place” or a horizontal evacuation mode. Understanding the “defend-in-place” mode is the most important piece of life safety information for any that a fire-fighter needs to understand. All fireground tactics and objectives used to fight a hospital fire need to be implemented understanding that many inpatients will remain in place. For inpatients to survive, it is important to know where the smoke compartments are constructed on the hospital floors. Work with the hospital’s director of facilities, tour the hospital, obtain a copy of the hospital’s life safety plans, identify the smoke compartments, and have a set of architectural floor drawings readily available at the hospital fire command center for an emergency response. Hospital pre-incident planning needs to be accomplished with the first-due companies or departments playing an integral role.

Additionally, it is very important to understand the fire protection features of the hospital. Although new hospitals built after 1991 are required to have full automatic sprinkler coverage, many existing hospitals may have either partial or complete sprinkler coverage. Because of their size, many health care facilities have a fire pump; where it is located; its gallons-per-minute rating; if present, the size of water tank and the fire reserve water capacity, and whether the fire pump activation is an automatic or manual operation. Fire-



(5) STEAM BOILERS.

fighters need to know if the fire pump serves standpipes and/or the automatic sprinkler system.

Fire-fighters also need to understand the fire alarm and detection systems in health care facilities. Many newer facilities have fully addressable fire alarm devices that will indicate the exact device that has activated. Although this is good information, the fire-fighters must know how to interpret the fire alarm device location and how to get there from the fire alarm annunciator panel. Older hospitals may still have a non addressable fire alarm system that will simply tell you zone where the alarm has activated.

Hospitals often are large complexes that



(6) HAZARDOUS MATERIALS STORAGE BUILDING.

may have multiple interconnected buildings. It is important to understand if the fire alarm systems in these buildings are tied together and how the alarms sound in connected buildings when a fire alarm device is activated in one building. Some hospital’s public safety or security staff may have done this prior to your arrival and will be able to assist fire-fighters in reaching the location of the alarm.

It is important to build a relationship with the hospital public safety or security staff prior to arriving at the facility for an incident. In addition to the public safety or security staff, most hospitals have an administrator-on-call and a house supervisor. The administrator-on-call is a hospital administrator responsible for providing leadership at a facility. A house supervisor is responsible for facility operations outside of normal business hours; this individual is typically a nurse and is focused on the clinical operations but will serve as the incident commander (IC) in the event of an emergency until the administrator-on-call arrives. Like the fire service, the hospitals follow the incident command system, and the administrator-on-call/house supervisor will be the hospital liaison to the IC, who will likely not be on site after normal business hours (i.e., midnight to 8 a.m. on weekends) and will be responding to the facility once notified of the incident. Having a predetermined fire



(7) BULK MEDICAL GAS STORAGE.

MANY OLDER HOSPITALS HAVE 100-PERCENT OUTDOOR AIR SYSTEMS; ALL OF THE AIR DISTRIBUTED THROUGH THE AIR HANDLER SYSTEM IS BROUGHT IN FROM OUTSIDE, AND ALL OF THE AIR BROUGHT INTO THE SPACE IS EXHAUSTED OUTDOORS. THE AVAILABILITY OF A 100-PERCENT OUTDOOR UNIT CAN BE VERY BENEFICIAL FOR OVERALL OPERATIONS. IN ADDITION PER NFPA 99 HOSPITALS ARE REQUIRED TO HAVE SMOKE PURGE SYSTEMS IN OPERATING ROOMS SO SURGERY CAN CONTINUE IN THE EVENT OF A SMALL FIRE.

command center location and communication protocols are important building features that a hospital staff must understand and meet responding fire department as part of the pre-incident planning process. Based on research by Fire Department of New York Battalion Chief Greg Bierster, “This can be one of the most critical elements of your preincident planning. The fire department IC will need access to the hospital liaison and the staff leaders from the medical, safety, security, and engineering departments to mitigate a fire incident.

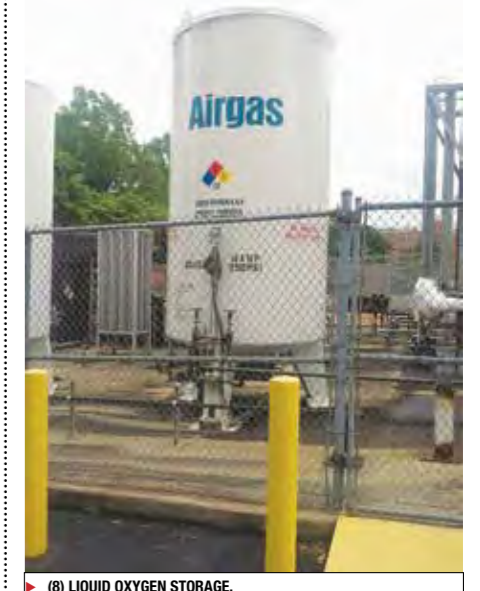
When fire-fighters review the life safety plans with the hospital staff, it is also imperative to gain an understanding of the building(s) heating, ventilation, and air-conditioning (HVAC) systems, medical gas systems, fire protection systems, the electrical systems, and the emergency generator system serving the facility. In the event of a fire, most hospital’s air handling units (AHUs) are equipped with duct smoke detectors, which automatically shut down the fan in the unit where the fire occurs.

Air handlers also have manual emergency shutdown buttons typically located in the vicinity of the nurse’s station; NFPA 99, Health Care Facilities Code, requires manual shutdowns on all air handlers serving patient care areas.

The manual and automatic shutdown devices assist in preventing the movement of smoke throughout the air han-

dling system.

Many older hospitals have 100-percent outdoor air systems; all of the air distributed through the air handler system is brought in from outside, and all of the air brought into the space is exhausted outdoors. The availability of a 100-percent outdoor unit can be very beneficial for



(8) LIQUID OXYGEN STORAGE.

overall operations. In addition per NFPA 99 hospitals are required to have smoke purge systems in operating rooms so surgery can continue in the event of a small fire. On activation, these systems will exhaust all air from the space and replace it with fresh air at the same rate the unit normally operates.

Some hospitals also may have a fire alarm panel smoke control system. These systems are very similar to a smoke control system in other commercial facilities.

Hospitals have medical gas systems that make use of oxygen, nitrous oxide, nitrogen, and carbon dioxide. These gases are typically stored in bulk tanks or in multiple larger cylinders combined at a manifold. The bulk tanks are typically located outside the facility, normally near a locking dock or receiving area. The tanks in a manifold system may be stored inside or outside, generally in the same location as the bulk tanks. Some of these gases are stored in a liquid form and they then expand to gas as they are used in the facility. These gases are then distributed throughout the facility and are segmented using zone valves. Zone valves allow isolation of the system; it is important to understand who is authorized to operate a zone valve. In most hospitals, the clinician in charge is the only individual authorized to operate the valve. In addition to these gases, hospitals will have medical air and medical vacuum. These two gases are produced on



(9) ELECTRIC SERVICE ENTRANCE.

site using medical air compressors and medical vacuum pumps.

Electric power is critical to a hospital's inpatient care and facility operations. Hospital's electrical systems are typically very large and complex.

THE KEY TO BEING SUCCESSFUL IN FIGHTING FIRES IN HOSPITALS IS TO UNDERSTAND HOW THE BUILDINGS ARE DESIGNED TO OPERATE AND HOW THE FIRE SAFETY FEATURES FUNCTION UNDER A FIRE OR OTHER TYPE OF EMERGENCY RESPONSE. AS WITH MANY THINGS IN FIRE-FIGHTING, THIS REQUIRES TRAINING AND PRE-INCIDENT PLANNING TO DEPLOY A DECISION-BASED KNOWLEDGE FOR PREDETERMINED STRATEGIES AND TACTICS.

When responding to a hospital fire, disconnecting electricity is complicated for two reasons:

1. The continual need for power even during a fire situation. It is not uncommon in a residential or commercial facility for fire-fighters to secure the power in the entire building or a portion of the building to eliminate the damage of electrical shock. When working in hospitals, fire-fighters need to know exactly what systems will be impacted when power is secured. The outcome of secur-

HOSPITALS HAVE MEDICAL GAS SYSTEMS THAT MAKE USE OF OXYGEN, NITROUS OXIDE, NITROGEN, AND CARBON DIOXIDE. THESE GASES ARE TYPICALLY STORED IN BULK TANKS OR IN MULTIPLE LARGER CYLINDERS COMBINED AT A MANIFOLD. THE BULK TANKS ARE TYPICALLY LOCATED OUTSIDE THE FACILITY, NORMALLY NEAR A LOCKING DOCK OR RECEIVING AREA. THE TANKS IN A MANIFOLD SYSTEM MAY BE STORED INSIDE OR OUTSIDE, GENERALLY IN THE SAME LOCATION AS THE BULK TANKS.

ing power without knowledge of the emergency power system that will be impacted may include removing power from inpatient medical equipment, operating rooms, intensive care unit areas, and so on. As discussed earlier, in many situations, operating room staff cannot simply stop surgery; they need to continue the procedure until the patient is stable and able to be relocated.

2. All hospitals have emergency generation capability. Fire-fighters need to have a clear understanding of the emergency power supply system at hospitals. Fire-fighters need to know the generator room location, the areas supported by emergency power, and how that power is distributed. This will vary greatly based on the age of the facility. At a minimum, older health care facilities will have a life safety in equipment branch; new health care facilities will have a life safety, critical care, and equipment circuit branches.

The following circuit branch requirements are outlined in NFPA 99:

1. The life safety branch is reserved for egress lighting and power needed for life safety systems such as fire alarm and suppression systems.
2. The critical branch is reserved for power to inpatient rooms, medical air, and medical vacuums pumps.
3. The last branch is the equipment branch reserved for items like HVAC equipment and elevators.

Another electrical utility issue to be aware of is multiple utility feeds into the hospital from the utility provider that serve particular areas of the facility with normal power. The areas supported by emergency power and how that power is distributed will vary greatly based on the age of the facility.

One of the best ways to gather pre-incident planning information is to work with the health care facilities management staff, which will have significant knowledge of the overall building system operations and fire protection features. It is critical that fire-fighters take advantage of the health care facility staff knowledge and document critical building information in the pre-incident plan for initial operations and beyond. Train all the fire-fighters on the availability of pre-incident plan information. It is important that the local fire companies and command staff as well as mutual-aid fire companies work with the health care facility personnel to coordinate the pre-incident plans into response actions so when the unthinkable happens, they are better prepared.

Once you have the critical building(s) information, it is important to document it in a manner that is readily available to any fire unit that may respond to the facility. Fire-fighters should also test the building information gathered when they have an opportunity. In many locations, hospitals have a significant number of activated alarms. When a company responds to one of these alarms, it should be used as an opportunity to test the pre-plan and the data that has been gathered from the hospital. Using this as a fire survey observations obtained during these alarms will provide a higher level of execution when they are needed for a more involved emergency.

Health care facilities across the country in large cities and small towns pose a very significant challenge and risk to fire-fighters. Hence, fire-fighters and command staff must learn about the hospital building features in their response districts and learn the building system features while they have the opportunity.

The key to being successful in fighting fires in hospitals is to understand how the buildings are designed to operate and how the fire safety features function under a fire or other type of emergency response. As with many things in fire-fighting, this requires training and pre-incident planning to deploy a decision-based knowledge for predetermined strategies and tactics. Having pre-incident building information will support various emergency situations, from initial operations by the first-due fire units to supporting further fire-ground operations.

(Source:www.fireengineering.com)

OIL & GAS SPILL AND LEAKS Offsite Fire Fighting

HOW OIL GAS FIRES TAKE PLACE. PRACTICAL TIPS TO FIGHT FIRES, SPILLS, LESSONS LEARNT OUT OF LIVE FIRE CASE STUDIES/EMERGENCIES OFFSITE ARE DISCUSSED.

THERE ARE MANY CASES WHERE OIL/GAS BEING CARRIED IN ROAD TANKERS/ FROM OIL/GAS PIPELINES HAVE LEAKED OUT AND RESULTED IN EXPLOSION AND FIRES OFFSITE ON ROAD WHICH ARE AWAY FROM THE OIL DISPATCH LOCATIONS LIKE TERMINALS. REFINERIES AND PLANTS. LESSONS LEARNT FROM VARIOUS LIVE CASE STUDIES, AND LESSONS LEARNT TO OBSERVE PRECAUTIONARY SAFETY MEASURES AND TIPS TO HANDLE SUCH EMERGENCIES AND USE PROPER FIRE FIGHTING TECHNIQUES ARE DISCUSSED

THE CASE STUDIES DISCUSSED SHOWS THE VARIOUS FIRE CONDITIONS/ SITUATIONS OF ROAD VEHICLES FIRES AND METHODS/MEASURES TO BE ADOPTED TO COMBAT/CONTROL FIRES. THESE CASE STUDIES GIVE PRACTICAL TIPS TO FIRE FIGHTERS TO COMBAT OIL/ GAS FIRES.



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BSC (Hons) Petroleum Engg,
AISM,
FIRE PROTECTION ENGG (USA)



CASE STUDY - 1

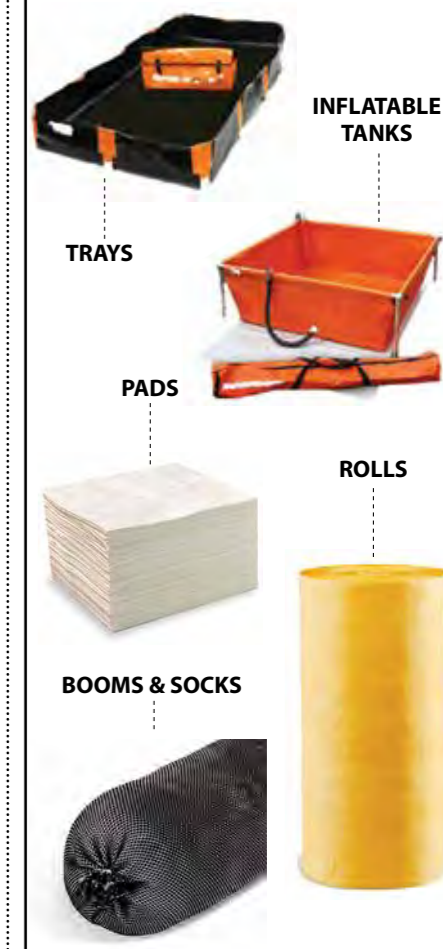
Scenario: Tank Truck Leak-Off Site

A tank truck has started leaking from the bottom shell plate on a road. The motor spirit is spilling on ground. There is no fire.

Handling Emergency:

- a) Barricade/cordon off the area;
- b) Divert traffic to alternate route;
- c) Allow no Matches/flames in the area;
- d) Make a mud bund to stop product entering into drains & collect spilled oil;
- e) Use sorbent pads/ booms to arrest spillage of product;
- f) Use water sprays to disperse vapor;
- g) Fill water into tank truck to raise oil level so that water leaks from the Shell plate hole;
- h) Use leak seal pad/ wooden plug to stop the shell plate leak;
- i) Transfer product into a sound truck;
- j) Check area for vapor accumulation.

METHODS TO COLLECT SPILL



CASE STUDY – 2

Scenario: Tank truck carrying MS has leaked from pipe on bottom manifold. The leaking product has caught fire at the bottom. The fire is also on the ground.

Handling Emergency

- Barricade 100 meters;
- Divert traffic;
- Do not allow any naked lights, persons with matches/cigarettes;
- No Naked lights, matches cigarettes to be allowed in area;

- Approach Tank Truck and under water spray cover and close master valve to stop leak;
- Use DCP extinguishers to extinguish the fire;
- If the fire becomes large, use foam hand lines from fire engine to extinguish the flames;
- Simultaneously cool the tank truck. With water sprays;
- Collect spilled oil in Pit or make a mud bund around to collect spill;
- Transfer spilled product into barrels/containers;
- Check area for vapor accumulation;
- Clean area.



CASE STUDY – 3

Scenario: Pipeline leak & fire in busy market place

A 14-inch die pipeline carrying kerosene oil started leaking in the busy market area.

The pipeline runs from Terminal 'A' to Terminal 'B' of the same oil company and covers a distance of 2 Km. Underground portion of the line developed a leak about 300 meters from outside of the terminal 'A'. The leaking kerosene started spreading in the busy market area where many small grocery shops etc were existing. Seeing the leaking kerosene, a large number of persons came with buckets to take away the kerosene. Oil Company staff immediately rushed to the spot and informed the police who restricted all the persons from collecting kerosene in

their buckets. The pipeline leaked area was dug up and it was found that pipeline was leaking at one of the joints and therefore a new piece of pipeline will have to be welded. Temporarily two clamps were installed to arrest the leak. Before welding the line it was necessary to water flush the line. A 14 inch line was flushed by putting a 4 inch dia water connection from Terminal 'A'. Outlet valve of the storage tank with which this pipeline was connected, was closed but no isolation connection was done. After twice water flushing of the line and the removing the product from pipeline, it was thought that welding operation could be done On the damaged portion of pipeline thinking it was vapor free. However outlet valve on the storage tank at Terminal 'A' was passing. The oil continues to flow in the pipeline and thus the oil & water started flowing in the pit and spread in the market area. Probably

due to spark from the nearby shop or from the welding splatter, there was a flash fire and the fire engulfed the pit area, a few nearby shops and there was a ground fire wherever the oil-water mixture was present. Dry Chemical Powder extinguisher, which was positioned, were used but could not extinguish the fire. Fire brigade was called and foam attack was started on the fire. Also portable fire pumps along with hoses, nozzles, and foam stock were brought from Terminal A by the oil company staff, which was used for fire fighting operation. Fire was extinguished within half an hour.

Handling Emergency

- Barricade the area;
- Evacuate minimum 100 meters all around;
- Do not allow naked flame in area;
- Isolate the pipeline by dropping flange or isolating flange;
- Close all valves;
- Use foam hand lines, Foam Trolley, Portable fire pumps for foam attack;
- Continue cooking operation with water spray so that there is no resignation;
- Collect oil-water mixture in drums or in empty vessels /truck tank/synthetic;
- Tank by using hand pump or by using flameproof motors;
- Check the area for any vapor floating with explosimeter;
- Clean the area.

CASE STUDY – 4

Scenario: Handling Leaks and Oil Spills A 12 ton LPG tank truck started, rolled over and started leaking on road. Vapors travelled to nearby field where a few hutments were there and caught fire. The fire jet impinged on the hutments

Handling Emergency

- Barricade the area.
- Start cooling the tank
- Allow gas to burn out since could not be extinguished

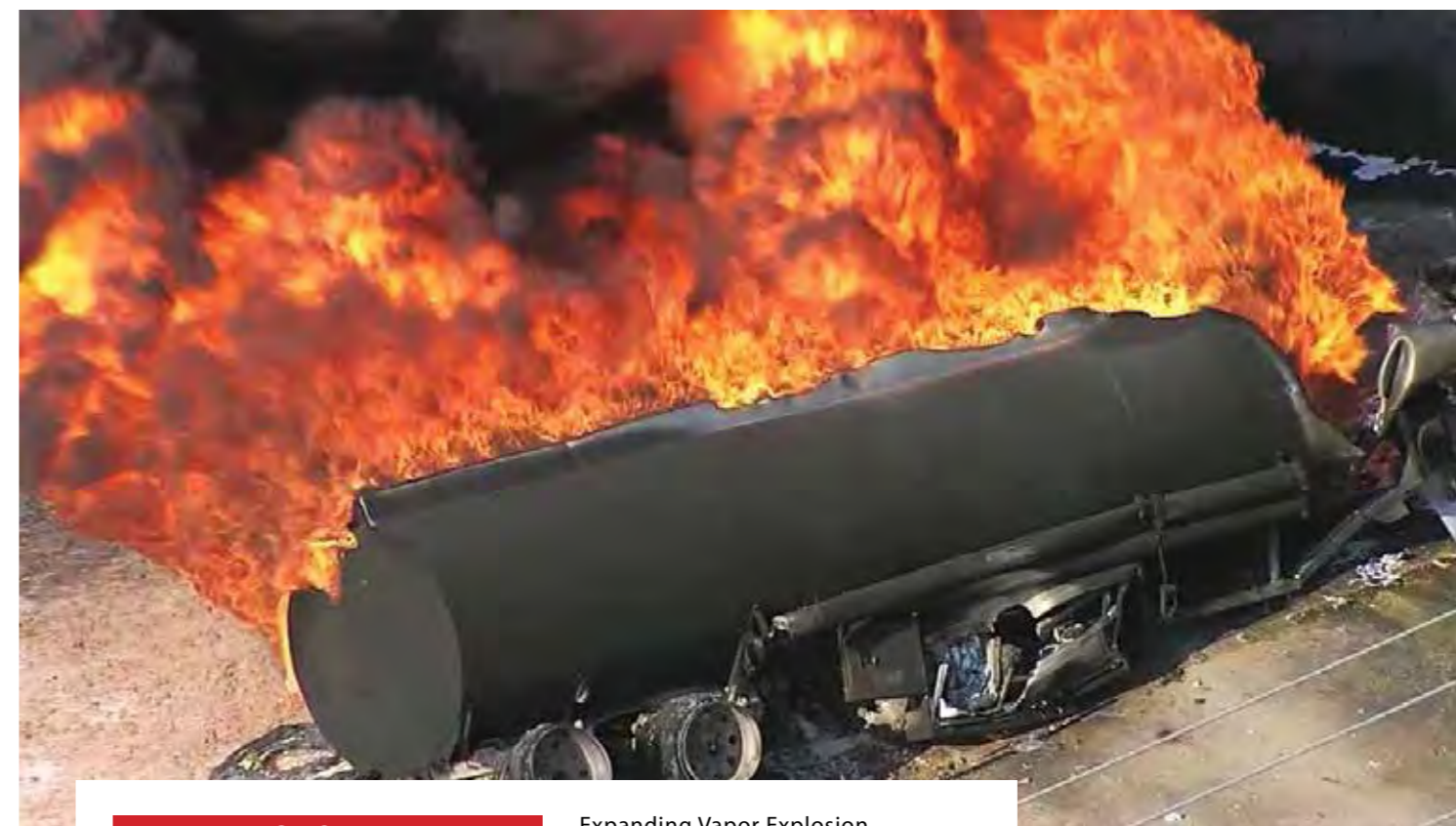


CASE STUDY – 5

Scenario: A LPG truck was passing under the subway rail bridge. The safety valve on the top of truck got sheared off under the bridge the gas started to leak and reached nearby village and caught fire. There was much causality due to burns

Handling Emergency

- Barricade the area;
- Alarm public nearby places;
- Evacuate;
- Cool the tank;
- Disperse gas cloud with sprays;
- Provide height barriers on trucks.



CASE STUDY – 6

Scenario: LPG leak BLEVE

A LPG truck was loaded at a facility to deliver product to a site where it had to make over night journey. The truck started leaking at the manifold on the way but no attention was paid. When it started leaking profusely the driver abandoned the truck on side of the road. The leaking gas came in contact with an ignition source and fire started, which resulted in BLEVE (Boiling Liquid

Expanding Vapor Explosion

The LPG vessel exploded into 3 pieces. The dish ends fell about 250 meters away from the central portion, which itself was found at about 650 meters from the damaged driver's cabin lying on the road. There was no casualty

Handling Emergency

- Cordon off area;
- Use water sprays to cool the tank;
- Watch if LPG flame is impinging from bottom on the truck body. It may explode and pieces may lift off to large distances.

SUMMARY

First Fire Responders, Disaster Teams, Mutual Aid Teams, Fire Combat Teams should know about the handling emergencies of flammable liquids and gases. Practical Tips given in this paper will help to fight and control such fires



Shri Sanjay Deshmukh, Addl. Municipal Commissioner alongwith Prabhat Rahangdale, Chief Fire Officer, Mumbai Fire Brigade with the speakers at the 'Fire Safe Mumbai - International Conclave' held on November 7, 2015 at Mumbai Fire Brigade HQ



FIRE SAFE MUMBAI INTERNATIONAL CONCLAVE THROWS LIGHT ON SEVERAL FIRE SAFETY ASPECTS



Audience in rapt attention



Mr. Santosh Warick, Director, Maharashtra Fire Services sharing a Lighter Moment with Mr. Yazdi Malu, Hon. Secretary NAFO



Shri Sanjay Deshmukh Addl. Municipal Commissioner Lighting the Lamp

WITH THE CITY GROWING VERTICALLY AND WITNESSING INCREASING INCIDENTS OF FIRE, THE MUMBAI FIRE BRIGADE IN ASSOCIATION WITH DNA AND ZEE 24 TAAS ORGANISED A FIRE SAFETY CONCLAVE IN MUMBAI ON DECEMBER 7, 2015, CALLED 'FIRE SAFE MUMBAI - AN INTERNATIONAL CONCLAVE.' THE CONCLAVE WAS PLANNED WITH THE PRIMARY OBJECTIVE OF CREATING MASS AWARENESS ABOUT PREVENTING FIRES AND MITIGATING THEIR ADVERSE EFFECTS. THE CONCLAVE HAD MANY DOMESTIC AND INTERNATIONAL EXPERTS SPEAKING ON FIRE SAFETY ISSUES. OTHER STAKEHOLDERS FROM THE FIRE FIGHTING AND SAFETY INDUSTRY TOO WERE PART OF THE CONCLAVE. THE FOCUS WAS ON FORMULATING A PERSPECTIVE THAT WOULD SERVE AS A GUIDELINE FOR FIRE BRIGADE PERSONNEL, CIVIC OFFICIALS AND INDUSTRY EXPERTS TOO.

One of the major issues discussed was fire safety science, which has attracted considerable attention in western countries but is in its infancy in India. With the city witnessing construction of a large number of high rises on one hand and at the same time, recent fires that have proved to be fatal, focus is back on fire safety norms.

This was a maiden attempt in India to involve all the stakeholders on a single platform. The agenda was to build up a

scientific basis for handling fire-related problems, promote high standards, to encourage and stimulate civic planners to address fire problems, to establish a suitable administrative foundation and the ways and means to facilitate the applications aimed at reducing



Shri P. S. Patankar High Court Judge (Retd.) inaugurating the Conclave by cutting the Ribbon



Delegates at the event paying rapt attention to the proceedings

the loss to life and property.

Among experts at the fire conclave were those from the US, UAE, UK, and Israel, who discussed international practices for suppression of fire in high-rises, passive fire protection, fire code best practice, early smoke detection, glass facades and evacuation solutions.

"It is important that the seals in the buildings are properly done. Also, it is important that tests are carried out for the right thing," said Robert James, Global Business Head, Built Environment U L Chicago, USA. James gave an example wherein a test was conducted on a material that is inflammable. "The test was conducted on the material to check if it burns when used in an appliance," he said.

Stating that part knowledge of anything is dangerous, Barry Bell, a fire safety consultant in UAE, said, "The code has a conduct and that is to ensure safety of life and property, and assuring that the fire does not spread. Here, the code seems to be in work in progress."

Kunal Ajgaonkar, Regional Manager, Xtralist, UK, while talking about early smoke detection, said there was technology for detection, which could save crucial time. "There is detection, assessment and then response to fire. Early detection means more safety," said Ajgaonkar, elaborating on laser-based android applications that are helping in advance detection.

On glass facades, which have been looked at critically in the city, architect Christoph Timm from SOM, US, said, "Sealing of gaps

should be done in such a way that it insulates and eliminates fire movement." Jonathan (Yoni) Shimshoni, CEO of Escape Rescue system Ltd, Israel, gave examples of lifts and other escape routes, including those in hospitals.

The architect fraternity was represented by famous Hafeez Contractor, more popularly known as the "man who draws India". Speaking about the challenges faced while designing high-rises, Contractor said, "There is a need for some radical changes in laws, because laws govern everything from architecture to design. There is ambiguity in laws with respect to fire safety." He also emphasised on the need to have a comprehensive fire manual in the state.

"We need to look at other cities such as New York, Shanghai, Dubai, and so on, which have a proven track record of constructing fire-ready buildings," he said. Most speakers agreed to Contractor's views on a standard fire manual, and requested Chief Fire Officer Prabhat Rahangdale to do something in this regard.

The developers perspective was presented by noted construction magnate, Niranjan Hiranandani. The president of the National Real Estate Development Council (NAREDCO) in Maharashtra was one among the several speakers at the conclave, who expressed their views on making Mumbai a fire-safe city. "Around 50 per cent of the city population resides in slums, meaning half of the population lives under unsafe conditions," said Hiranandani, adding, "We have the required technology, design ideas and rigour to change this paradigm. What we need is a document that gives a minimal idea about fire codes."

Hiranandani stressed on the importance of educating various stakeholders in the fire safety industry. "There is a need of propagation and education, instead of regulation. Everyone, including architects, interior decorators, developers and occupants should be educated with respect to fire safety," he added.

Mukesh Patel, honorary joint treasurer of the Maharashtra Chamber of Housing Industry (MCHI), too voiced his opinion regarding the matter. According to Patel, developers, architects and fire department are the three pillars of safety and development. He also suggested some steps such as drills, knowledge sessions, learning sessions, fire camps and so on, to spread awareness among common citizens.

Patel, on behalf of MCHI, declared the organisation of an award ceremony from this year onwards, to felicitate the fire-fighting personnel. He said it was essential to acknowledge the real heroes who ensured safety of the citizens. Seconding Patel on this, Hiranandani said, "We are all proud of the fire brigade. The fire fighting needs to be internalised so that there is transparency in the operations of all stakeholders."

The event concluded on a successful note with the delegates taking back with them a lot of insights on Fire Safety aspects.



Ajoy Mehta, Municipal Commissioner expressing his views



Sanjay Deshmukh, Addl. Municipal Commissioner emphasizing importance of fire services



Prabhat Rahangdale, Chief Fire Officer, Mumbai Fire Brigade affirming his belief of Fire Safe Mumbai



Niranjan Hiranandani, A Leading Real Estate Developer explaining the builders perspective



Hafeez Contractor, A Leading Architect proposing a uniform Fire Code manual

Fire Protection System For 30m. tall warehouses

IT IS NOTED THAT ACROSS THE INDUSTRIES, THE PROCESSES, THE METHOD OF OPERATION, THE MATERIAL BEING UTILISED, THE SOURCE OF POWER BEING UTILISED ETC. ARE CONTINUOUSLY EVOLVING IN ORDER TO MEET NEW DEMANDS FOR END PRODUCTS, CONFORM TO STRICTER POLLUTION NORMS, LESSER AVAILABILITY OF RAW MATERIALS, ETC.



K. MUTHUKRISHNAN
Technical Director
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UNNIKRISHNAN VALERI
Managing Director
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KEY FACETS AND RELEVANCE TO SAFETY

1. Due to the "JUST IN TIME" manufacturing planning, warehouses now form the crucial link in the supply chain and manufacturing businesses.
2. Cheap land is no-longer available. Hence when money is spent to allocate space for warehouses, it is obvious that "every pie worth" is tried to be extracted from the warehouse area. This is by increasing the height of the warehouse, stacking more densely etc.
3. More so the earlier model of business had the warehouses as an useless accessory area to the manufacturing unit which has been superseded and warehouse management team are expected to furnish their performance as a PROFIT CENTER by themselves.
4. More-so for organisations in warehousing businesses, Warehouses have now become the sole PROFIT CENTER for some key organizations including yours.
5. It has now become a practice for warehouses to be managed by a LOGISTICS MANAGEMENT which provides the building facility, the electric power supply managed with building management system etc. And some lease the warehouse to prospective clients. The LOGISTICS MANAGEMENT expects some minimum standard of automation and safety for their operations.
6. The warehouse applications have also undergone large changes. Earlier, bulk storage on the floor I rack storage with adequate space for the fork lift movement and hence installation of the fire protection system was possible.

Project Brief

The project site is at Mondipatti village, Mannapparai, Trichy District, Tamilnadu. The client already has an existing paper and paper pulp product in Tamilnadu and is setting up a second new factory to manufacture paper pulp products for the packing industry.

Unique Aspects

It is noted that across the industries, the processes, the method of operation, the material being utilised, the source of power being utilised etc. are continuously evolving in

order to meet new demands for end products, conform to stricter pollution norms, lesser availability of raw materials, etc.

But nowhere is the evolution more evident than the warehouse building design and processes.

The client also had earlier the warehouse for paper storage which was low height but this new plant has warehouse which is more than 30 m tall and is fully automated and stores paper products.

We describe a few unique aspects of some fundamental changes in the warehouse and complexity to handle fire protection systems.

Presently due to space constraints, "ASRS - Automatic Storage and Retrieval Systems" with much restricted aisle spaces, much higher rack storages have become the norm.

7. Further, some warehouses have hygiene in warehouse storage, they have imposed providing vertical separators of sections. These barricades cause limitation to sprinkler and detection system designs.
8. The stored product mix is now more greatly diverse as bar-coding and other identification and retrieval systems are not limited by human intellect to identify products. But due to this, the hazard could be badly varying and manifold.
9. The warehouse roofs, in many locations are made of "PEB" structures. But these have imposed limitation in supporting headers in the columns and branch sprinkler pipes in the roof.
10. The crane movements sometimes cause the fault signals in the beam detector type fire alarm system.
11. The risk insurance norms expect the pallets, the racks etc. to be of fire safe, listed and approved and these increase the planning in the conceptualization of the warehouse.
12. Warehouses generally have been given lesser priority in terms of safety, but in actuality, the warehouses have much more critical requirement for fire protection as is evidenced by the fact that there are more chapters in NFPA.
13. To handle storage goods than for the general hazards. The warehouse generally gets installed at the remotest part of the projects and away from the fire pump house.
14. Some warehouses become an enterprising playing ground, cum mall cum experience center inviting wide range of visitors other than professionals hence exacerbating safety requirements.
15. The configuration of the storage of the warehouse is "accepted" to be changed by the owners more easily than process areas as it involves lesser financial costs and operational impairment. This includes changing the height of storage, type of storage like bin, solid pile, portable rack, etc.
16. However all these have a drastic influence on the fire scenario and it could affect the performance of the system.
17. International clientele have set their base in India with expectation of their system provisions meeting the stringent standards.
18. Provision of reliable back up power, safe inbuilt active and passive fire protection systems including sprinkler system consisting of ceiling and in rack sprinklers as required in conformity to International and local codes, Fire detection and alarm system, etc. are now envisaged.

Building and Storage Particulars

The project has two storage warehouses - Intermediary Storage warehouse and Finished Storage-warehouse

Intermediate Storage Warehouse

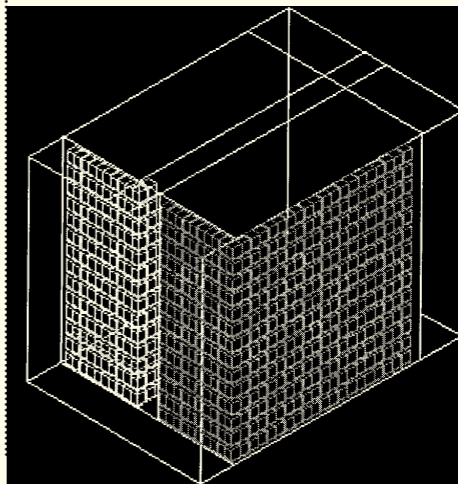
The intermediate bulk storage building is a steel clad building 118.5m long x 28.2m wide and 29.0m to roof level. The building will store 00.7 to 01.8m paper rolls stored horizontally in multiple row racks which extend to roof level and throughout the building. The building's roof and wall cladding is supported by the multiple row racking.

The storage racking comprises of vertical racking uprights spaced at 2.02m between upright centres forming 53no horizontal paper roll positions and horizontal storage supports spaced vertically at 2.02m forming 12 no. racking tiers. The paper rolls are loaded onto and off the racking by two automatic stacker cranes which maneuver via a longitudinal racking aisle 4.03m wide located approximately central to the building. At either end of the building a 5.5m wide laydown area is provided along the full width of the building.

Finished Storage Warehouse

The finished bulk storage building is a steel clad building 38.05m long x 45.44m wide and 28.5m to roof level. The building will store 0.75m to 1.2m wide x 1.5m high storage pallets stored in multiple row racks which extend to roof level and throughout the building. The building's roof and wall cladding is supported by the multiple row racking.

The storage racking comprises of vertical racking uprights spaced at 2.315m and 2.715m between upright centres forming 22no pallet positions and horizontal storage supports spaced vertically at 1.96m forming 14 no. racking tiers. The storage pallets are loaded on to and off the racking by a single automatic stacker crane which ma-



neuvere via a longitudinal racking aisle 3.1m wide located approximately central to the building. At either end of the building a 4.75m wide laydown area is provided along the full width of the building.

It is considered that the pallets will be manufactured from wood and the inner tube of the paper rolls will be manufactured from card. The paper stored is considered to be non-plastic coated medium weight paper rolls stored in banded horizontal rolls or stored in cardboard boxes on pallets and shrink wrapped. There will be no amount of expanded plastics and any un-expanded plastics stored will be no greater than 5 per cent of the stored goods. The commodity classification shall be considered as class III.

Control Room

The warehouses namely the Intermediate Storage Warehouse and the Finished Goods Warehouse are approximately 25 m from each other. Client has proposed a control room to manage the operation of the warehouses. This warehouse will accommodate the central fire alarm panel to supervise the air sampling detection and alarm system of both warehouses.

The site shall have power supply with following specification to supply power to the detection and alarm system of both the warehouses,
Voltage : 230 volts + 15%
Cycles : 50 cycles .

Unique Challenges to The Fire Protection System

- 30 M tall warehouse is much higher than the current standards covered by NFPA etc.
 - The roof is supported by racks and no separate columns.
 - The ASRS System has made the racks adjacent to each other.
 - Hence while normally beam type detection system is considered at the roof, in this project, detection of fire could be badly delayed by only providing detection system in the roof.
 - While ESFR Sprinkler system are normally provided in the roof, this warehouse has height and interferences which are not conducive to only roof type protection.
- A solution had to be worked out which could be acceptable to the international vendor as well.

Fire Detection System

The Solution for the Fire Detection System
This section outlines the design basis and operating philosophy for the Fire Detection and Alarm System for the project.

Air sampling detection system with detection at the roof level and in-rack levels would be the most ideal form of detection system for both the intermediate and finished bulk storage buildings.

The key advantages are as follows:

- Immediate detection of incipient fires is possible as the detection tubes are located at strategic location in between the storage racks.
- The tubes are small in size and could be routed to avoid direct obstruction to material movement.
- Each air sampling hole acts like a detector and hence each tube acts like multiple detectors.
- The air sampling detectors are certified by key testing laboratories like UL, FM, VdS etc. And hence their performance for the application could be guaranteed.
- The Controller could be located at an accessible location and cabling need not go to in-accessible locations. The controllers can be connected to an addressable panel at the control room for individual supervision of the fire and fault.
- Any damage to the tubes will be annunciated by the air sampling controller enabling immediate maintenance activity to be undertaken.

The scope of this document is to provide the design parameters and operating principles for the air sampling system and centralised fire alarm system for these buildings.

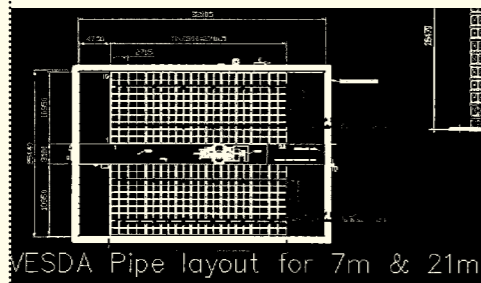
Design criteria-ASD system

The Air Sampling Design (ASD) system is considered as an ACTIVE form of detection because the aspirator continuously draws air from the protected area into the sensing chamber. This process is continuous and does not stop unless the ASD is shut down. The active nature of the ASD provides for the earliest possible detection of the presence of smoke, that's why ASD systems are often referred to as Early Warning Fire Detection Systems.

Reference Documents

The basis of design for fire protection systems will be based on the following Codes and Standards.

NFPA 72: National Fire Alarm and Signal



ling Code

IS 694: PVC Insulated Unsheathed and Sheathed Cables/Cords with Rigid And Flexible Conductor

IS 1554: PVC Insulated (Heavy Duty) Electric Cables - Part 2

Components of System

The basic ASD system has five main components:

- The sampling pipe network, which collects air through sampling holes and transports it from the protected space to the detector, where it's tested for the presence of smoke particulate.
- Detector, which is a sensing chamber with a high sensitivity sensor to detect smoke particles suspended in air along with an aspirator or fan to draw air from the protected area to the sensing chamber.
- An filter to remove all large particles that may damage the sensor within the sensing chamber.
- The housing for mounting the detector along with the I/O modules, power modules etc complete.
- The exhaust pipe to expel the sampled air from the detector.

Description and Operation of the System:

i. Sampling Pipe Network:

The sampling pipe network is connected to a port on the top or bottom of the detector. It's typically constructed of plastic, but can be made of copper, brass, or another non-ferrous metal. Individual manufacturers have specific requirements for sampling pipe. The type of pipe is determined by the specific application and specified in the design software.

The project will utilize two methods of sampling pipe networks,

- Single pipe configuration: In which, pipe is connected to the detector and extending through the entire covered space. Selecting this configuration may result in longer pipe runs and delay sampled air collection at the detector.
- Multiple pipe configuration: It is composed of multiple or branched pipes. It is utilized where the length of the protected area is smaller and hence, the full capacity of the detector could be utilized.

The sampling pipe can be installed horizontally at ceiling level, in-racks, or vertically in the warehouse. For concealed locations, wherein necessary the sampling pipe can be hidden in a void space with smaller capillary tubes to sample the space.

The piping network contains sampling holes that allow the air to enter the pipe. The individual sampling holes are sized according the design software, which considers the fluid dynamics of ASD systems and the type of design criteria of the detection system.

ii. Aspirating Smoke Detector:

The ASD systems as indicated above have similar components, but work on some key detection technologies as follows:

- Laser-Based Systems (Filtered).
- Laser-Based Systems (Non-Filtered).
- Cloud Chamber.
- Dual Source Sensor.

The air sampling detectors based on their sensing capacity as approved by certified authority like UL/FM etc. will be provided in suitable quantities.

Annunciation-Air Sampling System

The individual air sampling detectors controllers are strategically placed at various locations of the Intermediate warehouse and finished goods warehouse.

The individual air sampling detectors are capable of annunciating the fire detected by them. However due to a number of the air sampling detectors being provided and the detectors being installed at locations which are not immediately approachable. All the air sampling system detectors are connected to a central fire alarm panel which will be located at the central control room.

The particulars of the various devices constituting the fire alarm system are as follows;

Fire Alarm Panel

The centralized fire alarm panel will be of microprocessor based type.

Fire Protection System

The Solution For Fire Protection System

The active internal fire protection system comprises of sprinkler system for the warehouses with yard piping, external protection, pumping provided by customer.

The purpose of installing a wet automatic water sprinkler installation is to provide asset protection in the event of a fire. An automatic sprinkler installation is designed to detect a fire, signal an alarm and extinguish the fire in its early stages, or control it in order that the local fire brigade can achieve extinguishment should they so decide.

The sprinkler protection will be of the wet type with the sprinkler piping constantly charged with water under pressure.

The sprinkler protection for each building will be controlled via two Wet Installation control valve stations. The first station will control the sprinkler protection at roof level and the second station will control the inrack sprinkler protection.

The sprinkler protection shall be considered as Extra Hazard and the commodity classification of the stored paper shall be considered as class III.

The design will provide roof protection at high level over the racking with a minimum design density of 12.2 l/min/m2 over a maximum area of operation of 186m2. Maximum spacing of the sprinkler heads shall be 3.7 metres and discharge over a

Expression of Gratitude

We M/s UKA CONSULTING AND ENGINEERS PVT. LTD. express our gratitude to Shri Warick and all personnel of our esteemed fire department for providing us this opportunity to highlight this unique project.

Please feel free to contact us for any information or clarification and we will be obliged to provide the feedback.

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maximum area of 9.3 m2

The in-rack sprinklers shall operate at a minimum flow of 115 l/min with a maximum of 10no sprinklers operating (5no sprinklers on 2 branch lines). The in-rack sprinkler spacing shall not exceed 4.5m vertically and 3.1m horizontally.

Pipework and Fittings

Pipework

Pipe shall meet the requirements of the specification for IS: 1239 for the pipe sizes upto 150NB and as per 15:3589 for pipe sizes above 200NB. All pipes should have welded joints.

Up to and including 50mm (2" Nominal Diameter pipe, socket welded joints to be used. Above and including 65mm (2.1/2" Nominal Diameter pipe shall have butt welded joints.

Fittings

Fittings from 15 mm nominal dia to 65 mm nominal dia to be socket welded / socket threaded to ASTM A 105, dimensioned to ANSI B 16.11 3000 lb forged.

Fittings above 65 mm nominal dia upto 150 mm nominal dia to be butt welded to ANSI B 16.25, MOC to ASTM A 234 Gr. WPB and dimensioned to IS: 1239 Heavy Gauge.

Fittings above 150 mm nominal dia can be fabricated at site from pipe size of same thickness or can be pre-manufactured butt-welded fittings.

In exceptional cases or for UL listed / FM approved products with groove ends, then grooved fittings / groove - flange adapters could be utilised in concurrence with the client.

Pipe Supports

Pipework shall be supported such that no load is imposed upon plant machinery. Pipework shall be supported at intervals not exceeding the following:

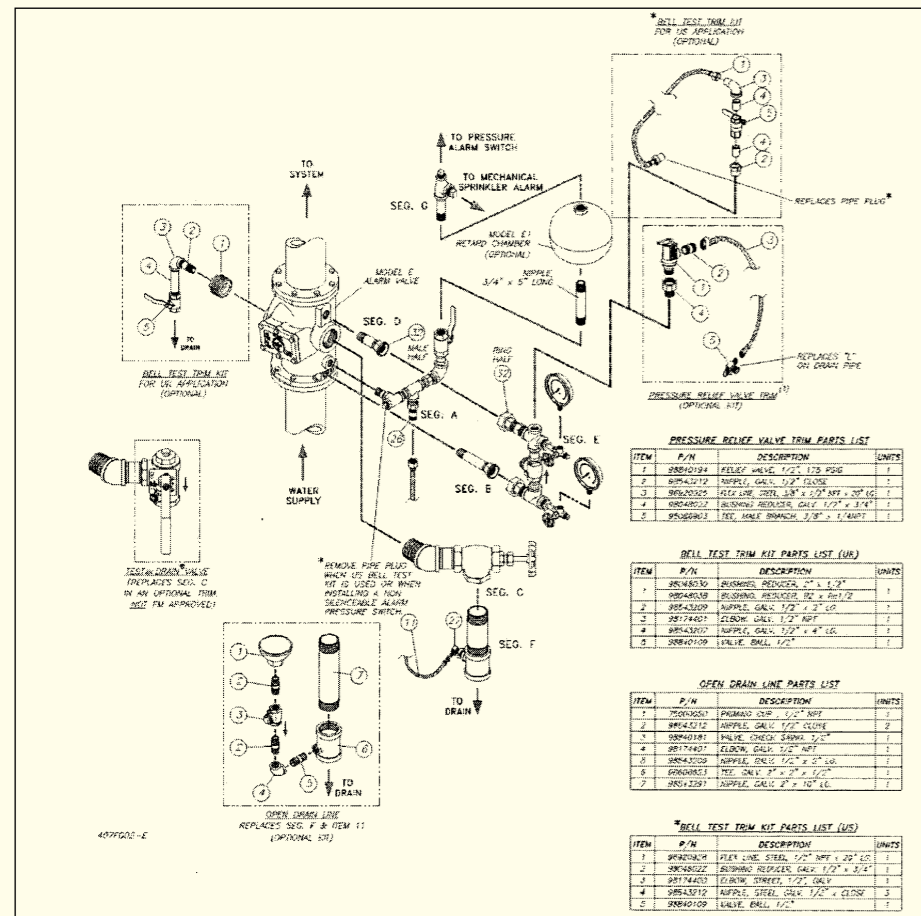
15mm	: 1.8m
20mm	: 2.5m
25mm	: 2.75m
32mm	: 2.75m
40mm	: 3.0m
50mm	: 3.6m
65mm	: 3.6m
80mm	: 3.6m
100mm and above	: 4.5m

Conclusion

The PROJECT follows the often sited issue that the implementation of "new project, requirements is much faster than the code preparations."

We all now need to run with the hare and hunt with the hounds.

We now need to understand the projects, the processes, the systems, the code compliance requirements and work out a on-going solution which will meet local code requirements, international vendor standards and client expectations.



► Fig 1 Diagram showing a typical wet alarm valve components



NATIONAL ASSOCIATION OF FIRE OFFICERS

(REGISTRATION NO.: S-35438 OF 1999 UNDER SOCIETIES REGISTRATION ACT XXI OF 1860)

MEMBERSHIP FORM

NAME: _____

RANK: _____

ORGANISATION: _____

ADDRESS FOR CORRESPONDENCE: _____

..... CITY

(PO) DIST. STATE PIN

TEL.NO MOBILE E-MAIL

AGE: DATE OF BIRTH: BLOOD GROUP:

QUALIFICATION (S) (ATTACH XEROX COPIES OF CERTIFICATES OF HIGHEST PROFESSIONAL/FIRE SERVICE QUALIFICATION)	EDUCATIONAL (HIGHEST)	
	PROF./TECH. (HIGHEST)	
FIRE SERVICE EMPLOYMENT PROFILE	NAME OF ORGANIZATION:	
	LENGTH OF TOTAL SERVICE:	
	PRESENT POSITION: (IF RETIRED SAY SO)	
	TEL: FAX: E-MAIL :	

APPLIED FOR :

SR. NO.	MEMBERSHIP TYPE	PROCESSING FEE	MEMBERSHIP FEE	TOTAL AMOUNT	PLEASE TICK MARK [✓]
1	ANNUAL / ORDINARY MEMBERSHIP (RENEWABLE EVERY YEAR)	NIL	500/-	500/-	
2	ELITE MEMBERSHIP (RENEWABLE AFTER EVERY 10 YEARS)	NIL	3000/-	3000/-	

MODE OF PAYMENT	DD/MO.NO	DATE	BANK NAME	AMOUNT

I hereby certify that the information given above is correct and also that I will abide by the Memorandum, Rules & Regulations of the Association.

Signature of the Applicant

Station:

Date :

N.B. Family members (Wife & Children) Names to be listed along with age.

C/o : Directorate of Maharashtra Fire Services, Maharashtra Fire Service Academy, Vidyanagari, Hans Bhugra Marg, Santacruz (East), Mumbai 400 098
Tel No. 2667 0439, Fax No. 2666 0287.

FOR OFFICE USE

The above application has been considered / not considered by the Sub – Committee onand the above enrolment No. is

GENERAL SECRETARY

An amount of Rs. as been received by DD/MO on and Receipt No

Dateis issued.

TREASURER

- DD should be drawn in favor of **NATIONAL ASSOCIATION OF FIRE OFFICERS**. Payable at MUMBAI.
- The Membership Form along with relevant fee should be sent to **Mr. Yazdi Malu Hon. Secretary, NAFO, C/o: Directorate of Maharashtra Fire Services, Maharashtra Fire Service Academy, Hans Burga Marg, Santacruz (E) Mumbai 400098 (Tel 022-26670438/39)**



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■ ■ **Analogue Addressable Fire Detection System**

■ ■ **Wireless Fire Alarm System**

■ ■ **Gas Flooding System**



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