



Fire is a 24/7 issue

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THERE is a flurry of media activity every time there is a big fire. Expert opinion on prime time news, interview of fire officers, live talk shows on television, newspaper articles, and so forth. But the enthusiasm is sadly doused with the fire and everyone gets on with their work until another, pray not, fire. As a result of which the building that was on fire is worse off in about say three months time. I am not necessarily referring to the BSEC building in the city's Karwan Bazaar, in which fire four persons perished in 2007.

More could possibly have lost their lives than the seven at the Bashundhara City on Friday the 13th of March this year (no need to get giddy with silly superstitions) had the fire occurred on a working day. As can be expected perhaps only in this country, on the fourth day of the fire, as the premises was made open to the public on the food court and shopping areas, the collapsible gate of a staircase was found locked on the ground floor. Lessons that save lives are meant to be learnt, not blown away with the smoke.

Engineer Syed Azizul Haq in this week's dispatch highlights several issues that need to be discussed and dealt with by authorities, institutions, and service providers. His paper comes almost two months after the Bashundhara fire which is in the right vein because it helps to continue our parley about fire. It is absolutely imperative for a safer tomorrow to make fire a 24/7 issue.

Without waiting for fire to strike, and it may strike anywhere at any time, the call of the hour should be for every building owner to survey their premises now, and see how safe it is from a potential fire, whether the electrical wiring and installations are being maintained, whether there are alternate routes to escape in case of a fire, whether the premises has its own built-in fire-fighting plan and equipment, whether fire service vehicles can approach their premises, whether they can save lives.

As for the media, they should keep up their good work which they commence after a fire, by monitoring risky buildings round the year, by conducting weekly television and radio programmes and by writing regularly on different aspects of fire to raise awareness among the public, and indeed to give the architects, engineers, building owners, operators, and tenants the right guidance. That will save lives.

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Major building fire incidences: Lessons learnt

ENGINEER SYED AZIZUL HAQ, PENG

HUMAN being invented fire which is being used for its better living and developed building structures for better and comfortable living. With the passage of time mankind's race for more comfort and better living resulted in faster development in building construction along with its various service systems like electricity, water supply, sanitary drainage, mechanical escalators etc. Increasing trend in population growth coupled with poverty laden economy provokes people to live in urban centres. Shortage of urban land coupled with high demand of building infrastructures compels construction of high rise buildings. Exorbitant cost of land and callousness of concerned regulating and planning authorities encouraged owners to construct buildings of bigger floors and levels than the rules normally permits. In this way the urban areas predominantly the Dhaka city has turned to a chaotic city entangling its dwellers into the almost all sorts of manmade hazards of life threatening. Fire is one of those hazards whose occurrence increasing day by day mostly in buildings. In Dhaka fire is becoming an unmanageable threat particularly in high rise buildings mostly constructed violating the national building code. This paper describes the various incidences of major occurrence of fires in various buildings drawing the pen pictures of the causes and finally put some suggestions to overcome the situation.

Some major incidences of fire in buildings

Fire in BSEC Bhaban: A devastating fire broke out at the Bangladesh Steel and Engineering Corporation (BSEC) Bhaban at Karwan Bazaar in the capital at about 10.15am on 26 February 2007. Within minutes the fire engulfed the entire floor and gradually started to spread to the upper floors, trapping hundreds of people inside. There were fire extinguishers on almost all the floors but none dared to use them. Finding no fire lift but a switched off lift, people from the first to the eleventh floors madly rushed to the central staircase to go out off the building. The first batch of fire-fighters came in from the Tejgaon fire station after half an hour of ignition. Twenty-five fire-fighting units from different fire stations and worked frantically for more than six hours to bring the fire under control. Acute shortage of water and inadequate equipment hampered the rescue operation, by the firemen who had to bring in water from the nearby WASA Bhaban and the Sonargaon Hotel. The army and the air force commissioned three helicopters to rescue dozens of people stranded on the rooftop of the building. The idea of airlifting them was eventually abandoned as the rotors of the helicopters fanned the fire. Three persons were killed and more than 100 injured in this incidence. NTV, RTV offices totally burnt and went off air. Several witnesses said the fire originated from electric oven; while some others said it was sourced from electric short-

target period will be more effective. Herein all the suggested action programs in this regard are categorized for implementing in three levels of target period as below.

01. Immediate action programmes:

- Improving capacity and performance of fire brigades
- Improving management of traffic system
- Vesting the responsibility of Building Office on an existing Department engineering in building development activities throughout the country.
- Finalizing detail area plans for Dhaka and subsequently for other cities and urban areas.
- Obligating 'rain water harvesting' in all buildings. At first in Dhaka and subsequently in other areas.

02. Midterm action programmes:

- Motivating building owners and developers to install fire safety measures in buildings.
- Registering professionals and licensing all contractors related to building development.
- Development of street hydrant system by water supply authority.
- Capacity building and performance improvement of all regulatory authorities, academic and technical institutions concerned of building development.
- Updating BNBC incorporating comprehensive fire safety codes.
- Establishment of Building Office.

03. Long term action programmes:

- Establishment of Building safety research centre to formulate and aware all safety aspects related to building industry.
- Taking steps for introducing forensic engineering in engineering curriculum and training programs.
- Establishment of independent National Building Commission.

Fire in factory cum residential building at old Dhaka: Nine people died in a fire at a five-storey building on Aga Sadeq Road, Dhaka on 4th April 2007. Of the deceased eight were of a family and the other person was a house help. Twenty others of the building were also injured. From witness sources it was found that during a power cut fire triggered from a lit candle over glue used in shoe making. The building was a mixed occupancy building having shoe factory in ground and the residential units at the upper levels. Building was in a congested part of Old Dhaka and built on a very small piece of land surrounded by other buildings from three sides. The fire brigade units faced difficulty in reaching the spot and could neither use powerful hoses from those sides nor launch rescue efforts.

Bashundhara fire: On 13 March 2009, Friday at about 1-45pm, a hell fire engulfed the upper levels of 20 storey office cum shopping centre known as Bashundhara City Complex at Panthopad, Dhaka killing 7 and injured 20 people. The top six floors were totally gutted. All fire fighting units of the capital and from its surroundings took about six hours to tame the massive blaze that raged through the Tower. Black plumes of smoke from the high rise spiralled upward, while blazing windowpanes, furniture, and other objects rained down on the pavement causing another fire in adjacent one storey furniture shop. Building's own fire fighters had very little training and they could not control the fire. Though the building was equipped with sufficient fire detecting, suppressing, and evacuating systems but they were useless during the fire. From the fire Brigade sources it was known that complex's water reservoir remained empty, the hydrants were useless as there was no water in the tank. Initially water was pumped from nearby Unique Trade Centre. The fire brigade received the first call at 1:35pm and sent a fire engine within 15 minutes, but did not have enough hoses or water sources to tame the fire. Fire fighters claimed that the blaze brought under control at about 7:00pm. i.e. after five and half hours after the fire outbreak. Due to faulty fire fighting system, fire alarms set up at the building gave false warnings at least 886 times in the last two years. The fire alarm on the 18th floor, where the fire broke out first, gave false alarm 18 times during the same period. As there was false fire alarms on many occasions the firefighters of the building didn't care about those warnings. The probe committee that was formed to find out the cause of fire could not identify the source and cause of fire but mentioned gross negligence of the Bashundhara authority in managing the fire fighting system for the building.

Loss and sufferings due to fire

Loss of Life and property: Since 1990, over 350 workers have died and some 1500 injured in fire-related incidents in garments factories in Bangladesh. Till 2000, there were more than hundred fires in factories in Bangladesh. More than 5000 workers were injured in these fires and 246 workers were killed.

Properties worth around Tk 39.34 crore were damaged in 836 fire incidents in Chittagong district last year.

Besides these direct losses due to fire there results huge intangible loss which remains always in the dark.

Psychological problem: It is learnt that a number of survivors from a fire at KTS Textile and Garments in Chittagong, killing 62 workers in February, are reportedly suffering from psychological trauma. From Chittagong Medical College and Hospital sources it was learnt some of burnt patients were suffering from "post traumatic stress disorder" who needed long term observation along with psychotherapy for being fully cured. Experience says that those patients could become mentally deranged if proper treatment would not be provided at the initial stage.

Losing job: After any devastating fire in any commercial or industrial units if the owners cannot restart their business after the incidence then there remains fear of losing job of the workers of the concern organization which brings huge sufferings to the victims and their family members as well.

Traffic congestion: Traffic

view to performing such difficult and risky jobs, this authority shall be well capacitated to manage fires that may occur at any corner and level within its boundary. Narrow width of road for fire engine vehicles to ply, height of buildings beyond the reach of turntable ladder, and lack of sufficient water in any operation are the major obstacles in performing their duty. Nevertheless, despite the following limitations the FSCD is doing a commendable job.

Dhaka city: Dhaka city now has 13 fire stations equipped with about 20 vehicles including water carrying tenders, and pickup vans for carrying pumps. The agency has only two hydraulic ladders which can hose water up to the 14th floor of a building at best and the country does not have helicopters equipped to put off flames in high rises.

Chittagong city: There are 11 fire stations in the city. Chittagong fire fighters are unable to douse flames beyond sixth floor of a high rise building. There is no turntable ladder.

Limitations: The major complaint against the fire fighters is that they often reach the place of fire late. For this rea-

son fighting was held in Dhaka Export Promotion Zone on 08 February 2006 in view to improving capabilities of the enterprises to protect fire accident and to create expertise of the workers of EPZ.

Fire drill conducted in secretariat: The Fire Service and Civil Defence authority conducted a fire drill in the 21-storey building of the secretariat on 19 March, 2009 to educate the officials and employees about what to do in case fire breaks out.

Construction of intelligent building: There are 15 fully intelligent buildings in Bangladesh. All are built in Dhaka. These intelligent buildings have automated fire fighting and suppression systems, air conditioning systems, and access control with CCTV and intruder alarms.

Failure of the concerned authorities: Buildings cannot be made cent percent fire occurrence proof but loss due to building fire can be minimized to satisfactory level by taking various measures amongst which planned development of cities and strictly regulated building construction are the major factors to be satisfied,

a survey prepared by a NGO. Rest 28 percent of high-rise buildings keep some arrangements and equipment to deal with fire and earthquake, but there was doubt whether those could be hardly used when needed. This situation emerged due to absence of any office that can monitor the safety aspects related to building construction, maintenance, operation, and above all occupational safety. According to BNBC there shall be an authority to be named as Building Office who would be shouldering these responsibilities. This office is yet to be established though following BNBC in building management has been obligated through amendment of Building Construction Act in 2006.

Fire safety and some limitations of BNBC

■ Bangladesh National Building Code (BNBC) has been published in 1993 with a view to streamlining the building construction practices which was done before following various guidelines at one's will. BNBC provided sufficient guidelines to make a building safe in all respect including safety against fire hazards. Almost 16 years have passed after the emergence of BNBC. By this time technology has advanced a lot. Moreover this was the first effort of its kind. So in few cases some shortcomings in the BNBC may have surfaced. Some of those in respect of fire safety of buildings have been discussed below.

- BNBC did not mention categorically what type and extent of fire safety measures shall be incorporated in respect of type of occupancy, size of building, location of building and importance of building.
- Incorporation of fire hydrant from rooftop water tank working under gravity does not ensure perfect solution for fire suppression requirement by water.
- Use of 50mm landing valve and hose is not common, which is incorporated in BNBC.
- Guideline for hydrant sizing gives result for using relatively higher sized hydrant.

Lessons learnt

Though fire in buildings are mostly coloured as accidents, but in reality they are primarily caused due to some mistaken acts of human beings involved in the process of manufacturing, collecting, installing or maintaining any items or works that may have initiated a fire. The extent of loss due to fire can be minimized by taking various protective measures like detection, evacuation, suppression and running rescue operations. So for successful avoidance of fire occurrence in buildings and satisfactory achievement in protective measures and rescue operations the related factors should be flawless. But the incidences of fires and situations prevailing in fire related issues so far delineated reveal that in all aspects of fire avoidance, protection and rescue operations there exists more or less various problems, some of which have been listed hereunder:

01. Building aspect: Planning related problems

- High rise buildings lack of proper refuge areas.
- Adequate and proper escape routes are not provided.
- Inadequate width of approach road for fire engines to reach the building.
- Underground reservoirs are mostly undersized for holding adequate water for fire fighting.
- Fire hydrants may not work properly for faulty design.
- Building components are seldom designed considering fire resisting ratings.

- Lack of exit signals for escape route.
- Doors of escape routes are not made as fire doors.
- Use of substandard and untested materials causing fire and aggravating fire.
- Bad workmanship due to engagement of unauthorized working personnel.

Maintenance related problems

- Escapes routes remain blocked.
- Parked vehicles, unauthorized establishments etc. obstruct exits to the open air.
- Fire fighting detectors and equipments are seldom tested and checked as routine work.
- Absence of regulatory authority to care for all safety aspects of building.
- Unauthorized construction of buildings of mixed occupancies.

02. Institutional aspect:

- The authorities and the institutions responsible for urban infrastructural development and various service providing activities suffers from manifold problems. Incapacitation and lack of cooperation and coordination among the institutions or the authorities intensifies the fire related hazards.

Incapacitation and lacking of concerned authorities

- Lack of sufficient fire fighting equipment and personnel of fire brigades.
- Supplying sufficient quantity of water by the Water Supply Authorities.
- Controlling quality of building materials impairing fire safety by BSTI.
- Failing in finalizing detail area plan for the cities by the concerned development authorities.
- Lack of coordinated and integrated efforts among concerned authorities for holistic development.
- Absence of building office to regulate building development and maintenance activities.
- Poor initiatives for capacity building and performance improvement of the concerned authorities.
- Lack of initiatives for sustainable development in a planned, integrated and coordinated manner.

Way forward

The problems so far surfaced up in various levels of activities are not difficult to solve. Planned approach toward mitigating the problems identified will bring holistic preparedness in managing the anticipated fire incidences in buildings. It will not be wise to take all the steps at a time rather implementation of action plans within multiple



movement in the vicinity of the fire occurrence become more or less to a standstill because of any fire. Where in normal situation the traffic movement in many parts of the city roads remains nearly standing condition, in case of any fire at city centres it creates heavy grid lock at almost all the roads nearby. The extent of such effect widens depending upon the main reason is the gathering of the onlookers at the site. The onlookers create all sorts of trouble in fire fighting and rescue operations. In this circumstances law enforcing agencies become literally helpless, which badly hampers in rescue and fighting operation resulting avoidable losses.

Fire Brigade's capacity and limitation

The Fire Service and Civil Defence (FSCD) authority is held responsible for suppressing fires that occurs within its jurisdiction and run rescue operation for the victims. In addition as per Fire Prevention and Dousing Act 2003 (original in Bangla) the Fire Service and Civil Defence authority is empowered to inspect any building and check its compliance with the fire safety provisions. With a

sons they sometimes get attacked by the victims of fire. Firemen can fight for about 30 to 40 minutes with their carried water in a single tanker, which might be too meagre than the demand. In such cases they had to search for reserve water from nearby buildings or other sources which is seldom found to be sufficient. Though the FSCD has been entrusted with the responsibility of checking the status of fire safety provisions of buildings, the reality is that there is no instance that FSCD inspected any private high rise buildings to ensure its occupants safety from fire hazards in the building. But the authority claims that it inspects government high rises as a routine work.

Some positive initiatives

Amidst limited resources and capacity the FSCD has taken various steps to keep people safe from fire as far as possible. On the other hand some committed owners have shown respect to the prevailing building code by constructing safe buildings for its occupants. Here some of those initiatives are cited.

Demonstration on fire fighting:

A demonstration on fire

Unfortunately in these regards the cities are lagging far behind due to the failure of the respective concerned authorities. The following factors point toward those failures:

Not finalizing the detailed area plan (DAP) for Dhaka: The detailed area plan (DAP), the major component of the DMDDP, could not be prepared in about 12 years, leading to unplanned urbanization. Being drafted in 1995, the 20-year DMDDP plan was approved by the government in 1997 with retrospective effect, but it is yet to be materialized for want of the DAP.

Lack of enforcement of BNBC: Around 90 per cent buildings are being constructed in the capital city in violation of building construction regulations prepared on the basis of Bangladesh National Building Code 1993 (BNBC). Majority of the building owners have committed gross violation of setback rules followed by the urban development authorities due to lack of proper monitoring by the respective concerned authorities.

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