

A report on
manchesters
woolworths fire
history essay



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Woolworth, which consist of six floors and two basement floors. There was no sprinkler system was installed at the store, on 8th May, a fire was notice by a painter, who was working in store. He informed all the people in restaurant area to get out off there and also raised alarm to inform others about the incident. There were about 500 customers and staff members were present at the store during the time of fire. Fire developed rapidly which formed a layer below the ceiling above the heads of occupants and as soon as the smoke plume reached the walls it flowed down to ground level due to which the occupants in the centre of the hall could not locate the exits.

It was believed that fire was started by damaged electric cable that had furniture stacked in front of it. The furniture was made up of polyurethane foam whichonce ignite would have spread rapidly, producing larger amount of thick dence smoke which would had soon obscured the exit signs. This would had led to confusion and together due to which the occupants in the centre of the hall could not locate the exits.

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During fire abou 10 people died, 26 were rescued by fire brigade and 6 others were assisted from the building by the fire personnels. Of which 47 people were shifted to hospital and 6 fire fighters were also injured in the accident. 90 % of second floor was seriously damaged by fire, third, fourth
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and fifth were severely damaged by smoke also first floor was slightly damaged. Stock that was placed at the first and in basement floors was damaged by fire fighting water.

StarDust Disco Fire:-

On 14th February 1981 a fire broke out at a Stardust Night Club in Artane, Dublin, Ireland in early hours of 14th. Around 840 people had attended disco and from which 48 died and near about 210 were injured due to fire. It was claimed that fire started by a slashed seat cover allowing a flame, possibly from a cigarette to ignite the foam beneath and also the paper decorations for Valentines night vinyl (PVC) covered, over polyurethane foam cushioning. Due to which the fire spreaded quickly in the seating arrangement area which had a curtain in front, due to which fire was not seen at its starting stage and was noticed when it reached the curtain from where the evacuation time was very less.

All the attendants as well as the people attending the Trade Union function tried to escape but were hampered as many of the fire exits were locked using padlocks and chains. Some had chains draped about the push bars. Also many of them tried to escape from mens toilet window but could not make it up as it had a metal plate fixed from inside and iron bars on the outside. So 7 people died in the toilet itself. But finally after investigation it was confirmed that fire was due to Arson.

(Reference:- Google search engine (en. wikipedia. org/wiki/stardust_fire) and David Purser note of Fire Investigation Case Studies)

Kings Cross Fire:-

It took place on 18th November 1987, about 7: 30 in the evening fire smoke was seen coming out from one of the wooden escalator that was used for transporting the passengers up from the platform levels to the ticketing hall. Fire-fighters after reaching the site saw fire burning about 20 feet below the escalator shaft with four feet high flames emerging from the escalator stairs. Then fire suddenly spreaded to the ticketing hall and created severe conditions, like that of a flashover. Thick black smoke started emerging from the entrance of the station and large amount of passengers exited to the street. The fire burned for several hours and killed about 31 people including the station officer, who died rescuing the lady from the fully engulfed ticketing hall.

During Investigation it was found that the fire was resulted due to discardment of lighted stick by a passenger and engulfed the wooden escalators. The spread of fire was due to establishment of trench effect, which caused hot gases in the buoyant plume to lay along the escalator surface and create a rapid airflow which caused these gases to curl over and over towards the next stage above. The airflow in the trench increased in proportion to the size of the fire, eventually creating a flamethrower type effect up and into the ticketing hall.

(**Reference:- www.firetactics.com/kingscross.htm)**

Dupont Plaza Fire:-

The fire broke out on 31st december 1986 and was initiated by three disgruntled employees of the hotel that were in dispute with the owner of the hotel. The hotel had total 423 rooms which were all filled and all the tables in the penthouse restaurant were reserved. This fire killed 97 and injured about 140 peoples. Some of them placed open cans of flammable liquid which was used in chafing dishes, in the storage room adjacent to ballroom on the round floor. Also the storage room was filled with the unused furniture from the hotel which contains mixed materials including cellulose (ie: wood) nitrogeous and non-nitrogeous having polymers (ie: wool, acrylics, plyourethanes etc). The fire was started deliberately by organising a fight for distraction in front of ballroom and the others let the fuel ablaze. The fire ignited the furniture in the store room and burned out of control, growing to massive proportion and flashing over. Initially security personnels didnt find that important to inform the people at its earlier stage as it was confined. But it started growing out of control and some point security officer saw things getting dangerous. So then he walked through to the casino trying to warn the occupants to evacuate the place as fast as possible but little of them noticed it as all were busy in their blackjack and fruit machines.

Initially the plume passed through an opening in the ballroom and filled it with smoke from under the ceiling. Fire then engulfed highly flammable airwall producing larger flames, in the ballroom. After which the superheated gases swept up the grand staircase into the lobby of the hotel, from where the fire was sucked into the open doors of the casino by the smoke-eaters

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present through out the casino. Most of them died in casino as they could find only one egress from the casinowhich were a pair of inward opening doors and the casino patrons pressed against the doors to no avail. Some of them left from second floor of the casino from the plate glass window to the pool deck below. Few of them went to the upper floors of the casino from the deadly smoke and others were consumed as they rode through the elevators to the lobby only to discover the conflagration when the door was opened. Many died of smoke inhalation and in the late afternoon the survivors were rescued from the top with the help of helicopters.

(Reference:- Google Search Engine (en. wikipedia. org/wiki/dupont_plaza_hotel_arson) & (www. times. com/time/magazine/article/0, 9171, 963192, 00. html) and from the notes of David Purser.

Buncefield Fire:-

The fire took place in the early hours of Sunday on 11th december 2005 and number of explosions occurred at Buncefield Oil Storage Depot, Hemel Hempstead, Hertfordshire. From which at least one of the initial one was of massive intensity and was a large fire, which engulfed most of the area of the site. In this over 40 people were injured and none of the fatality took place. But significant damage was found in commercial as well as residential building in the nearby area and large area around the site was evacuated. The fire was burning for several days and destroyed most of the site giving dense black smoke cloud in the atmosphere.

Three progress report of the plant made it clear that the overfilling of a fuel storage tank (No. 912) led to an escape of fuel. This in turn led to the

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formation of flammable vapour cloud that subsequently ignited. About 2000 people living near the site were evacuated while the others were advised by the police to keep their doors and window closed because of fumes. In explosion about 20 fuel tanks were participated, each holding about 3 million gallons of fuel. The fire ball that came from the back of the building was about 50 meters wide as said by the tanker driver at the spot.

Many houses were damaged reporting felling effects from the explosion as far as away as Oxfordshire and the noise of explosion was such that it was heard in number of counties and even in France and Netherlands. Witness reported buckled front doors, crackled walls and blown out windows.

The Oil depot was the fifth largest fuel distribution depot, it was also used by BP, Shell and British Pipelines and was generally storing oil, petrol and kerosene which was supplied to the airports across the region, including Heathrow and Luton.

(Reference:- Google Search Engine. (www.buncefieldinvestigation.gov.uk), (www.buncefieldinvestigation.gov.uk/faqs.htm) & (news.bbc.co.uk/2/hi/uk_news/4517962.stm)

Hickson & Welch Explosion:-

It occurred on 21st September 1992, during the clean out operation of the still known as " 60 still base" which was organised to remove residues. This vessel was never been cleaned since it was installed in the nitrotoluene area in 1961. The operator dipped the sludge to examine it and reported that the sludge was gritty with the consistency of soft butter to management. No

sample was taken for analysis and nor the atmosphere of the vessel was checked for the presence of flammable vapours inside and it was proposed that the material was thermally stable tar.

In order to soften it, steam was applied to the bottom of the battery and was advised not to exceed 900c. Employees started cleaning using the metal rake. The material was tar like and had a liquid entrained in it. After about one hour of cleaning process longer rake was used for taking out tar to reach further still. The vessel temperature gauge in the room was showing 480c, instructing to isolate the steam. After some time only single person was left at the scaffolding for the cleaning process and the one who was left for cleaning stopped raking and noticed a blue light, which turned instantly to an orange flame. Suddenly a jet fire occurred from the man hole which lasted for about one minute and projected horizontally towards the Meissnes building and vertically shot out of the top rear vent to the height of the distillation column nearby. The jet severely damaged the building and then impacted on the north-face of the main office block causing a number of fires to start inside the building premises.

There were many reasons that were proposed for the reason for this accident and were, The decision to clean out vessel for the first time after 30 years, Failure to analyse the sludge and atmosphere within the vessel prior to cleaning, Thermal stability and the effect of the impurities in the sludge, Identifying the potentially hazardous impurities, Inadequate measurement of the sludge temperature, because of the position of the temperature probe.

Also faulty pressure reducing valve on the steam supply at the higher

pressure then anticipated, Failure to isolate the still base inlet prior to the <https://assignbuster.com/a-report-on-manchesters-woolworths-fire-history-essay/>

work commencement, Using metal rake to clean the sludge from a still containing flammable vapours, Identifying the ignition sources and eliminating them and also the positioning of the occupie building was not proper.

(Reference:- Google search engine. (www. hse. gov. uk/comah/lossprov. pdf))

Bradford City Disaster:-

The Bradford city disaster occurred on Saturday, May 11, 1985 when the flash fire consumed one side of the valley parade football stadium in the Bradford, England. Total of about 56 people died in this disaster.

It was proposed that the fire started when a spectator dropped a match or cigarette, which fell through the holes in the stand to the rubbish which was lying below the stands. One of the witness saw the debris and papers on fire about nine inches below the floor boards just five minutes before the half time at 3: 40pm from back of " G" block. The call to fire brigade was timed at about 3: 43pm until which the fire escalated and flames become visible after which the police started evacuating people from stands. The blaze become to spread, the roof and the wooden stands were on fire making atmosphere choke with smoke in it was difficult for the spectators to breathe. The wooden roof which was covered with the tarpaulin and sealed with asphalt and bituman caught fire. The material combined with the strong wind to spread fire along the stands creating the impression of fire ball, setting fire to the entire stand, where many spectators were trying to escape. It took less than four minutes for engulfing the whole stand in flames.

There was no extinguisher placed in the stands passageways for fear of vandalism and supporters either ran upwards to back of the stands or downward to the pitch to escape but most of the exits at the back were either locked or shut and there were no stewards present to open them, but seven were either open or forced to open. There was panic as fans stamped to exit which was padlocked, but two three man put their weight and smashed it to open. The people who escaped from fire and other team members helped to rescue the spectators from stands. The death toll includes 3 who tried to escape from the toilets, 27 who were found by the exit K and turnstiles six to nine at the centre of the stands and two elderly people who died on their seats. Some have been crushed as they tried to crawl under turnstiles to escape. Half those who died were either aged under 20 or over 70. More than 265 spectators were injured.

Fire destroyed the main stand and left only burned seats, lamps and fence.

(Reference:- Google search engine. (en. wikipedia. org/wiki/Bradford_city_stadium_fire.))

MGM Grand Hotel Fire:-

MGM fire occurred on November 21, 1980 at MGM hotel and Casino in Bally's Las Vegas in Paradise, Nevada, USA. Fire killed about 85 people most through the inhalation on smoke. At the time of fire about 5000 people were there in the hotel and casino, its a 26 storey luxury resort with more than 2000 hotel room in it. Just after 7: 00 in the morning fire broke out in the hotel named The Deli. Smoke and Fire spread through the building killing 85 and sending about 650 to the hospital, including guests, employees and 14 fire-fighters. Due to fire most of the second floor casino and restaurant was <https://assignbuster.com/a-report-on-manchesters-woolworths-fire-history-essay/>

damaged. People died on the top floor of the hotel due to inhalation of smoke as it spreaded throughout the building through openings in vertical shafts and sesmic joints.

Fire was caused by a electrical fault in a wall soffit. This wiring was used to power refrigeration unit for food display cabinet in The Deli. The fault took place due to vibration on the machine which caused rubbing of wires as a result of which the wire arced was damaged and fire was developed, which was noticed by the hotel employee after certain hours. Fire started spreading to the lobby, which was full of wallpapers, PVC pipings, glue and plastic mirrors, racing through the casino floor with the speed of about 15 to 19 feet per second, untill the massive fire ball blew out of the main entrance. 7 people died in the casino and majority of deaths were caused by toxic fume and smoke that was generated from the burning material.

Toxic fumes circulated throughout the building through hotels circulating system, due to faulty smoke dampers within the ventilation duct, which accelerated the spread of poisonous air. Many deaths occured in the stairwells, where all the doors were locked behind each person as the open doors in the stairwells were on the roof and groud floor. Also some died in their sleep only due to inhalation of smoke. Fire remained confined to the casino and the restaurant area as there were no sprinklers installed in this particular areas of the hotel, whereas other areas of the hotel were protected.

From the total number of deaths 75 died from inhaling smoke and carbon monoxide, 4 died from smoke, 3 from burns and 1 from massive skull trauma caused by jumping from a high window.

(Reference:- Google search engine

(en. wikipedia. org/wiki/MGM_Grand_fire))

Heliopolis Hotel Fire:-

On February 28, another fire at hotel fire at Cairo, Egypt turned to be an tragedy killing 17 and injuring approximately 70 people. The fire in the hotel broke out from the Arab tent that was set up in the garden attached to the outside of the hotel. The spark from clay bread oven let the tent on fire, whose flames ignite the decorative aluminium panels. Thus a large fire spread in the entire side of the hotel and broke into the hotel from the windows of kitchen/restaurant area and at the floors above.

Hotel was constructed in the three wing form, core in the centre consisting of elevators and stairs. Fire first spread to the core and then moved down the interior corridors. Some areas of the hotel were damaged from outside at the point where the fire entered the hotel and the rest was damaged from inside. At some locations there was serious structural damage and the people died when the fire or effluent penetrated and many doors provided a protection from fire and smoke. The fire spreaded quickly in the hotel as no sprinkler system was installed in it.

Aluminium panels were burned and melted and also the steel sandwich panels remain although most of the foam from inside was burned away and

the windows are lost all the way to the top, as the fire penetrated from all levels.

(Reference:-Google Search engine. ([www. iklimnet.com/hotelfires/case42. html.](http://www.iklimnet.com/hotelfires/case42.html)) and From the notes of David Purser))

10) Dusseldorf Airport Fire:-

On 11th April 1996 fire broke out in an occupied terminal building of the Dusseldorf, Germany killing about 17 and approximately injuring 62 people.

At about 3: 31 pm sparks were seen falling from the ceiling of the flower shop in the arrival hall. About 3: 38 pm smoke was seen coming out from the vents in the flower shop and the ceiling began to glow up and drop burning ambers.

By the time the fire was extinguished there were about 712 fire fighters from 12 different departments with total of 215 pieces of apparatus. From the people that died, 7 died in two elevators that they used to come down from the garage roof after seeing the smoke coming out of the terminal building opened in the area of fire on the first floor. Eight more died in the Air France VIP Lounge. Two of them died as they entered the elevator which opens in the terminal car parking during the fire.

Authorities determined that the fire began when the welder was working on the expansion plates in a roadway above the lower level of the terminal from which the glowing cinders and metal pieces loosened them to fall onto the false ceiling of the arrival hall coated with the polystyrene, which ignited the polystyrene insulation used in the void above the ceiling in the first floor. The

smoke and flames engulfed whole first level and moved towards the second through the opening for staircase and the elevators. People in the Air France VIP Lounge died as the smoke entered through the air-conditioning system. Other thing that was the fire personnel was knowing that the people are trapped in the Lounge but could not save them as they don't know the exact location of the room as there was no co-operation between the teams of Airport and municipal fire brigades. Smoke significantly damaged about two-third of the second and third floor of the building. The area of the terminal in which the fire started was not equipped with sprinklers and the posts were installed in the curb side but were not connected to municipal connection of water and had to be charged with the help of the fire apparatus.

The factors that contribute in the spread of fire were supposed to be, Failure of workmen to take adequate precaution during welding, Presence of combustible insulation in the ceiling voids, Lack of automatic suppression system, unprotected vertical openings that allowed fire and smoke to spread to the upper floors, Inadequate means of escape from the VIP Lounge on the mezzanine level and both the elevators that opened into fire area. Despite of all these problems rescue people managed 2000 people safely.

(Reference:- Google Search Engine. (www.nfpa.org/assets/files/pdf/dusseldorf.pdf) & (www.european-hospital.com/topics/article/545.html) and From the notes of David Purser.)

11) Manchester Airtour Fire:-

On August 22, 1985 during the take-off of British Airtours flight 28M, a boeing 737-236, captain heard a loud thump sound coming from under the

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plane. Captain thought that it was a sound of tyre burnt and abandoned the take-off and activated thrust reverses. The plane was carefully steered towards the taxiway and into the slight prevailing wind. As the plane was stopped crew noticed fire in the engine 1.

During this time, fuel spilling from the port wing combined with the wind and turned fire into the big blaze, which quickly found its way to the passenger cabin creating the smoke and causing deaths of 53 passengers and 2 crew members. From which 48 died of smoke inhalation and 78 passengers with 4 crew members were escaped from the flight from which 15 had serious injuries.

During investigation it was found that number 9 combustor can on the port of the engine had developed a crack due to thermal fatigue. Thus it moved out of the alignment and diverted the hot combustion gases to hit the casing of the combustion chamber instead of diverting them out of the back of engine. Which resulted into catastrophic explosive failure of the casing. Then the can was ejected from the engine fracturing a fuel tank access panel and allowing the jet of fuel to move towards the hot engine exhaust. This sparked a blaze which engulfed the aircraft. The things that went wrong during the accident are, The captain thought that it was a tyre burst and braked slowly and cleared the runway which allowed fire to spread and decreasing the evacuation time. No one checked the wind direction before taking the decision to turn right since the accident occurred. This all took place just about 30 seconds after aircraft began its take-off roll, as the airspeed passed 125 knots, left engine suffered the failure, which punctured wing fuel

tank access panel. They had no indication of fire until 9 seconds later, when the left engine fire signal occurred.

(Reference:- Google search engine. (en. wikipedia. org/wiki/British_Airtours_Flight_28M) & (www. skybrary. aero/.../B732_British_Airtours_Manchester_UK_1985_(AW_Fire)))

12) Mont Blanc, Channel Tunnel Fire:-

On 24th March 1999, 30 people died when a Belgium transport truck carrying margarine and other food stuff caught fire in the tunnel. At about 10: 55 the tunnel employees sounded the fire alarm and stopped any other vehicle from entering. But at this time the tunnel was populated by at least 10 cars/vans and about 18 trucks that entered from the French side. Some vehicles from the Italian side passed the truck without stopping and some cars from the French side managed to turn around to return back, but negotiating the road in the dense smoke that filled the tunnel rapidly made it impossible. The larger truck had no option, many drivers rolled up their window glasses and waited for rescue. The ventilation system in the tunnel drove the toxic smoke back down the tunnel faster than anyone could run to safety.

These fumes quickly filled up the tunnel letting the vehicle engine stall, they need oxygen to run now. Two fire trucks from Chamonix responded to the site but the fire had melted the wirings before that and the tunnel was under darkness filled with dense smoke. The fire engine could not proceed due to smoke and wrecked vehicles blocking the road. The fire crew abandoned their vehicle and took refuge in two of the emergency fire cones.

As they were standing behind the door could hear burning fuel roll down the road surface causing tyres to pop up and fuel tank to explode.

All of them were rescued by the third fire crew which reached them through ventilation duct. Out of 15 that were trapped, 14 were in serious condition and one died in hospital. The fire burned for 56 hours reaching the temperature of 10000c because of margarine in the trailer which was equal to 23, 000 liters of oil in the tanker, which spreaded to other vehicles carrying the combustible loads. It trapped around 40 vehicles in dense and poisonous smoke. The authorities compounded the effect by pumping the fresh air inside the tunnel from the italian side forcing poisonous smoke through the length of the tunnel. 27 died in their vehicles, 10 died trying to escape on foot. Of the initial 50 people trapped by the fire, 12 survived. It took 5 days for the tunnel to cool down completely before starting the reconstruction work.

(Reference:- Google search engine. (en. wikipedia. org/wiki/Mont_Blanc_Tunnel)

13) Summerland Leisure Centre Fire:-

Summerland disaster occurred when a fire spread through the summerland leisure centre in Douglas on the Isle of Man on the night of August 2, 1973. 50 people were killed and 80 were seriously injured.

Fire started at about 7: 30pm in the kiosk adjacent to the minigolf course which eventually slumped to the exterior of the building. This part of the building was made up of bitumen-coated steel structure having less fire resistivity. Thus the fire was set to the interior sound proofing material of the

building. Due to this the explosion took place and the highly flammable Acrylic sheet which covered the rest of the building was on fire. It spreaded quickly, with the help of shet on the walls of the leisure centre and on the roof, also through the vents that were not properly protected. The acrylic sheet on burning started dropping melted material which injured the people those were trying to escape and started few fires below. Many unblocked internal spaces in the building acted as a chimney which resulted into conflagration.

Fire service was not called upto 30 minutes after the fire and when it was called it was the coast guard that called and no one from the centre. There was no attempt done to evacuate about 3000 people in the centre until the flames prompted a panic due to which many people were crushed as they rushed for escaping through the exit and many trampled as they found the locked doors. The centre was seriously damaged by this fire and was rebuilt in smaller scale.

(Reference:-Google Search engine (en. wikipedia. org/wiki/Summerland_disaster))

14) Great Fire Of London:-

It was Sunday, 2nd September to Wednesday, 5th September when the major conflagration swept the central parts of London. It engulfed about 13, 200 houses, 87 parish churches, St. Paul Cathedral and the most of the buildings of the city authority. It was estimated that it destroyed the houses of about 80, 000 people of the city. The death toll during the fire was unknown but it was thought that, it was very less as only six verified deaths were recorded.

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Fire started from the bakery of Thomas Farriner on Pudding Lane approximately at mid-night on 2nd September, Sunday and spreaded rapidly towards west side of the London city. During this period most of the fire-fighting techniques was by creating the firebreaks by means of demolition. But it was delayed due to the indecisiveness of Lord Mayor of London. By the time of demolition orders were given on Sunday night, wind have already made a bakery fire into the firestorm. Fire was pushed towards the north on Monday, into the heart of the city. On Tuesday, fire engulfed most of the city destroying St. Paul Cathedral and started leaping the river fleet. During this period fire fighters were able to stop the spread as the winds towards died and the Tower of London used gunpowder to create effective firebreaks to halt further spread of the fire.

Fire hazards in the city due to which the fire spreaded rapidly was considered were, overcrowded warrens of narrow windings, cobbled alleys, Buildings with wood and roofing with thatch, Foundries, Smithies, Glaziers, The typical Six-Seven storey timbered London tenant houses and Jetties. The riverfront was the important clue in developing the great fire as the poor districts located near the riverfront had stores and cellars of combustibles that increased the fire risk. London was also full of black powder especially in the area of riverfront. Five to Six hundred tons of powder was stored in the tower of London at the north end of London bridge. Also the ship chanderls along the wharves had large stocks stored in wooden barrels.

The factors that affected fire fighting the most was the narrowness of the streets. At the time of fire this passages were blocked by the refuges and

others with their belongings to escape outwards from the centre of destruction, as the fire engines and crew struggled to move in.