**The Application of Criminal Law in Non-Terrorist Disasters and Tragedies – 2018 Edition**

The initial list was posted two years ago at denisbinder.com. I realized at the time that it was incomplete for three reasons. First, it will never be complete because new incidents are always occurring. Second, I was unable to identify incidents two years ago that I knew or suspected existed. Third, early reports of an incident often suffer from the “Fog of Wars.” The “facts” may vary over time.

The original posting included 200 incidents. This revised listing includes 421 incidents, many of which preceded the earlier posting date of September 26, 2016. Much of the increase is due to the ability to uncover prior incidents, many of which received little publicity or have been forgotten in time. One example is the October 22, 1895 French railroad crash with the classic photo of the locomotive resting at a 90° angle outside the station. I could easily find it once I had a clue on what to look for. Another reason is the increased posting online of earlier publications.

This list will never be complete. Do not therefore treat it as 100% accurate or definitive. Instead view it as a “ball park” figure, representative of the cases. For example, India leads the listings with building collapses followed by China with mining disasters. Other incidents exist in these countries, but it not always possible to find reports of criminal prosecutions in every reported building collapse or mining disaster. My listings are for those which I can ascertain criminal proceedings on the internet.

For example, one article described the poor safety practices of the Changyuan coal mine, where 32 miners died in a gas explosion on November 26, 2006: “[T]he mine’s five-person management staff was comprised of one junior high school graduate, three primary school graduates and one illiterate employee.” Lee Wand, et al, An analysis of fatal gas accidents in Chinese coal mines, Safety Science 62 (2014) 107, 112. However, I could not find a report of a criminal prosecution in that incident.

The criteria for listing remains the same in 2018 as in 2016. Listings are based on incidents with at least one fatality, except for environmental disasters with extensive environmental damages, such as oil spills contaminating hundreds of miles of shoreline.

An example of an unlisted incident is the indictment of the Arkema North America and two executives in a chemical plant flooded by Hurricane Harvey striking Houston. The chemicals, which could not be kept frozen when power failed, exploded on August 31 and September 1, 2017 releasing a toxic cloud. No one was injured since the area was successfully evacuated prior to the explosions and releases of toxic gasses.

Workplace accidents and construction accidents are common globally. They are not included in the listing, unless a major tragedy such as the 2015 1,350 ton crane collapse at Mecca with 111 fatalities or the 2016 scaffolding collapse in Fengcheng, China, killing 74 workers on a cooling tower under construction. In those situations I added similar incidents with a fatality to the list.

A fatal case which received substantial attention in the scientific community was the death of a graduate student/lab technician at UCLA. The untrained lab tech suffered fatal burns on December 29, 2008 when she mishandled highly flammable chemicals. Safety standards were lax in the academic lab. Los Angeles brought criminal charges against both UCLA and the supervising professor. They both settled the cases. The academic community globally improved lab safety. I do not list the case because I view it as a form of workplace accidents.

The listing is based on arrests, charging statements, detentions, or indictments rather than convictions or guilty pleas. The outcome of many cases remains unavailable on-line.

I was greatly indebted to Regina Zernay ’17, two years ago for her assistance. I am equally indebted this year to Nandita Nayyar for her assistance. She was quite diligent in tracking the resolution of many incidents.

The lists do not include an analysis of the results, which can be found for the first listing at Denis Binder, The Findings of an Empirical Study of the Application of Criminal Law in Non-Terrorist Disasters and Tragedies, <https://doe.org/10.1016/jfutures.2018.01.008> and Denis Binder, The Findings of an Updated Study of the application of Criminal Law in Non-Terrorist Disasters and Tragedies, 9 The Bus. & Mgmt. Rev. 153, Vol 2 (November 2017).

My theses in collecting the cases were multiple:

1. A substantial increase in prosecutions have occurred in the New Millennium;
2. Cases often involve government officials and employees for corruption, dereliction of duty, and negligence;
3. Many of the cases arise in Asia and the Pacific Islands, and
4. The substantial increase in prosecutions in the New Millennium is probably caused by the widespread use of cell phones with photo and video capability and social media.

I cannot prove the fourth premise. Nor can I often explain why some incidents result in prosecutions while similar ones do not.

Two surprising discoveries were the large number of cases in which charges were brought against architects and especially engineers. The second surprise is that a number of cases dragged on for over a decade. Delays in initiating legal proceedings can be due to the technical expertise that must be used to determine the cause of the incident and the extent of human involvement in the disaster and tragedy.

**TABLE OF CONTENTS**

**I. COLLAPSES** 5

1. Building Collapes …….……………………………………………………………………………………………………………………………………………………………………………………..5
2. Flycovers Collapses ……………………………………………………………………………………………………………………………………………………………………………………...14
3. Roof Collapses …..………………………………………………………………………………………………………………………………………………………………………………………….15
4. Pier Collapses ………………………………………………………………………………………………………………………………………………………………………………………………16
5. Amusement Parks ………………………………………………………………………………………………………………………………………………………………………………………..17

**II. ENVIRONMENTAL** ………………………………………………………………………………………………………………………………………………………………………………………………..18

**III. EXPLOSIONS AND FIRES** 22

1. Explosions 23
2. Building Fires 28
3. Circus Fires 31
4. Nightclubs, Concerts, and Theaters.………………………………………………………………………………………………………………………………………………………………31

**IV. INFRASTRUCTURE** 36

1. Bridges 39
2. Dams ………………………………………………………………………………………………………………………………………………………………………………………………………….. 39
3. Subway Tunnels …………………………………………………………………………………………………………………………………………………………………………………………..42

**V. MINING** 44

**VI. OIL SPILLS** 54

**VII. TRANSPORTATION** 58

1. Aviation 58
2. Maritime 66
3. Pipelines 76
4. Railroads……………………………………………………………………………………………………………………………………………………………………………………………………….77

**VII. MISCELLANEOUS**………………………………………………………………………………………………………………………………………………………………………………………………..84

1. Cranes …………………………………………………………………………………………………………………………………………………………………………………………………………..84
2. Demolition ……………………………………………………………………………………………………………………………………………………………………………………………………85
3. Landfills …………………………………………………………………………………………………………………………………………………………………………………………..………..….86
4. Scaffolding ……………………………………………………………………………………………………………………………………………………………………………………………..…….86

**IX. NATURAL DISASTERS** ………………………………………………………………………………………………………………………………………………………………………………………..87

|  |  |  |  |  |
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| **A. BUILDING COLLAPSES**   1. **COLLAPSES** | | | | |
| **Date** | **Incident** | | **Facts** | **Criminal Resolution** |
| 9/12/1983 | Gangaram Building collapsed, Bangalore, India | | 7 story building under construction collapsed, 123 deaths and over 120 injured. | Owner and 3 contractors arrested. The Karnataka High Court on February 22, 2005 affirmed the trial court acquittal on grounds that the prosecution failed to properly examine the witnesses. |
| 8/13/1993 | Royal Plaza Hotel, Khorat, Thailand | | 6 story hotel collapsed into rubble because of addition of three unpermitted floors without adequate structural or soil stability studies. The supporting structures were inadequate. 137 deaths and 227 injuries. | Charges filed against 15 defendants, including hotel owner, management, engineers, and municipal officials. All were acquitted except for the chief engineer, who was sentenced to 37 years. |
| 6/29/1995 | Sampoong Department Store, Seoul, South Korea | | 5 year old department store collapse. Plans were for 4 stories, but went up to 5 with large, heavy air conditioner on 5th. Many Supporting columns removed. Original builder backed out and gave warnings to owners. Numerous physical warnings before the collapse. No warnings to customers or employees, but management left the building 2½ hours before the collapse. 502 deaths and 937 injured. | Owner and son convicted of criminal negligence. Chief administrator of the neighborhood sentenced to 3 years for bribery. 23 other defendants, including 12 city officials, received prison sentences and fines. |
| 5/24/2001  4/11/2005  7/18/2007 | Versailles Wedding Hall Disaster, Jerusalem, Israel  Spectrum Gardens collapse, Savar, Bangladesh  Laxmi Chhaya Building collapse, Borivli, India | | Third floor of wedding hall collapsed, 23 deaths, 356 injured, building was designed for industrial purposes – not as a meeting place for large groups, used banned floor system, faulty engineering, building violations  Building, built on marshland, had several unapproved floors, 70 dead, over 100 injured  Owner of two first floor shops decided to merge them by removing connecting wall and reducing a central support column, weakening the foundation. 28 died and 15 injured when building collapsed. | Designer of flooring system sentenced to 5 years and 3 other engineers to 12-30 months for negligent assault,  2 owners of banquet hall sentenced to 30 months, third owner received 4 months suspended and 4 months community service  Managing director of the factory and another director arrested, released on bail, and that was the end of the case  Owner and brother arrested for culpable homicide not amounting to murder. |
| 8/28/2007 | Building collapsed Baku, Azerbaijan | | Foundation designed to support 9 story building, but up to 14 stories without approval. Building imploded under construction, killing 20 workers. | 3 company officers arrested as was the public official in charge of the department for coops and apartments. The charge was abuse of power. |
| 2/11/2008  1/23/2009 | Kazipara, Howrah, India  5 storey buildin under construction suddenly collapsed, Nairobi, Kenya | | Basement and first floor of mall under construction collapsed.  Construction flaws, 14 deaths | 5 arrests, including the project supervisor and the supplier of building materials.  Owner and three supervising construction arrested, as well as 4 city council members for lapses in building permit and inspection process |
| 6/27/2009 | Lotus Riverside collapse, Shanghai, China | | Nearly constructed 13 story block of flats Lotus Riverside) tipped over, construction permit expired 5 years earlier, foundation undermined when unqualified contractor was building an underground garage. One construction worker died. | 8 arrested. Largest shareholder of  the company was found guilty of graft, embezzlement, and causing a serious accident. Second largest shareholder also convicted of graft. The head of the complex for the developer, the builder, subcontractor, engineer, and 2 construction workers sentenced to 3-6 years for causing a “criminal major accident” |
| 7/22/2009 | Liaquatabad, Karachi, Pakistan | | 4 story building under construction collapsed, sub-standard building materials, 18 deaths, over a dozen injured. | 2 builders and 2 officials of the Karachi Building Authority arrested. |
| 1/29 /2010  11/20/2010 | Kowloon, Hong Kong  5 storey building collapsed, Lalita Park, East Delhi, India | | Unlicensed repairman chiseled a column and platform at the Kwa Wan Tenement, causing the building to collapse, 4 deaths.  15 year old building constructed on shaky river bed, clearance to build by municipal official to build 3 stories on land where new construction was barred, heavy rains and flooding, 71 deaths, 82 injured, | Repairman convicted.  Owner arrested for culpable homicide, officials transferred |
| 7/16/2011  9/27/2011 | Shalimar Building collapse, Ghaziabad, India  Chandni Mahal building collapse, Old Delhi, India | | Building collapsed under construction, constructing a 433-square meter basement – only a 87-square meter basement approved, structural failure, 4 deaths.  Heritage building collapsed, building collapsed because of digging work on adjacent building under construction, 7 deaths, 23 injuries | Police registered charges against the builder, her two sons, the building contractor, project manager, and supervisor, government engineers transferred and suspended  Owner and contractor arrested |
| 4/15/2012 | Shital Fibres Blanket Factory collapsed, Jalandhar, India | | 23 workers died, and over 60 injured. | Owner, supervisor, and 4 contractors charged with death due to negligence. All were acquitted 4 years later. |
| 6/23/2012 | Elliott Lake Algo Centre Mall, Ontario, Canada | | Roof collapsed on mall, beam and column supporting roof gave way, 2 dead, several injured. | Engineer who inspected the mall 2 months earlier and called it sound was charged with 2 counts of criminal negligence causing death and 1 count of criminal negligence causing bodily harm, lost his professional license in November 2012., judge in 2017 acquitted defendant of two counts of criminal negligence |
| 3/29/2013  4/4/2013 | Building collapse, Dar es Salaam, Tanzania  Building collapse, Thane, Mumbai, India | | 16 story residential building collapsed onto an adjoining mosque, poor design, ignored a stop order, approved for 10 floors, up to 16 with 3 to go, 24 deaths  8 story building under construction collapsed, 74 deaths, including 23 women and 18 children (workers and their families often live on construction sites), poor quality materials in a “weakly built” structure; lacked a occupancy permit, bribes to local leaders. | 12 arrests, including owner, his son, 2 engineers, architect, and 2 government officials, initially charged with murder, reduced to 24 manslaughter charges, charges dropped in 2016 against 7 former civil servants and 3 businessmen  17 arrests: 2 builders, developer’s partner, engineers, police officers and municipal officials.  Charges include culpable homicide and dereliction of duty.  Charges framed against 27 defendants for culpable homicide not amounting to murder |
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| 5/13/2013  6/10/2013  8/29/2013  9/23/2013  10/12/2013 | Rana Plaza collapsed, Savar, Bangladesh  Altaf Mansur building collapsed, Mahim, India  Madhavnagar Colony,  Twin Building Collapse, Atladara, India  Babu Genu Market 5 story building collapsed, Mumbai, India  Space Residential Complex, Medellin, Columbia | 8 story garment factory collapsed, built on swampy ground, poor construction, poor quality construction materials, 2 stories added with heavy machinery above permitted 6 stories, converted from commercial use to factory, workers ordered to go back into building after cracks appeared the day before in the structure, 1130 fatalities, about 2,500 injuries  35 year-old, four storey building collapsed, 3 civic engineers had not responded to complaints about 2008 renovations, Maruti showroom on ground floor, alterations on ground floor caused collapse, 11 deaths, 6 injuries  11 deaths, 3 injuries  457 homes in 33 blocks, 2 blocks collapsed, structural design flawed, inferior building materials,11 deaths, 3 injuries  Brihanmumbai Municipal Council (BMC) owned building collapsed because of the construction of a mezzanine floor in an office-warehouse, illegal alterations in basement, warnings ignored, victims were BMC employees, 61 deaths and 32 injuries.  26 story, 54 unit, Tower 6 of six tower of recently constructed residential complex collapsed, cracks showed up in a column, evacuation ordered day before collapse, low density concrete used, calculation load and structural plans not reviewed, collapse damaged Tower 5, all 6 towers demolished, 12 deaths, I resident returning to retrieve goods, 2 security guards, and 9 workers assessing the problem | | 42 arrested, including owner of building, owners of the garment factories, several inspectors, national and local officials, Mayor suspended from office and arrested, judge issued arrest warrants in 2015 for 24 suspects who failed to show up to face murder charges  Owner, Sohel Rana, separately sentenced to three years in 2016 for failure to disclose wealth to anti-graft commission  Ground floor owner of car showroom, and civic engineer arrested, charges filed against landlord  Site supervisor, contractor, and structural engineer arrested for culpable homicide  7 BMC employees arrested for not acting on reports that the building was unsound after completion of the renovation, tenant arrested for illegal alterations  Builder, construction chief, project manager, structural engineer arrested for manslaughter, head of Medellin office of granting building and renovation licenses for willful misconduct XXXXX |
| 10/31/2013 | Building collapse, Pune, India | | 5 story, year old building collapse, 1 death, cracks had appeared in building one day before collapse. | Builder charged with culpable homicide, plot owner and structural engineer also charged. |
| 11/21/2013 | Roof collapse, Riga, Latvia | | Roof collapsed at the Zolitude Shopping Center Roof support beams failed. 54 deaths, including 3 rescue workers. | Construction engineer, expert analyst for the architectural firm, and five others charged with building code violations. 3 public officials, City Council’s supervisory Board’s senior expert, and chief and deputy building inspectors, charged with liability of negligent public officials. The case was the first test of Latvia’s new statute imposing criminal liability on corporations.  Latvia’s Prime Minister resigned shortly after the accident. |
| 1/4/2014 | Canacona, Goa building collapse, India | | Multi-story building under construction collapsed, 31 workers died. | 9 officials suspended and arrested: chief officers, municipal engineers, deputy town planner, and draftsman. Contractor also arrested, while authorities were searching for 2 builders. |
| 4/29/2014  6/27/2014 | Surat, India  Inderlok, India | | Building constructed in 1999 had cascading slab failures in 2014. 3 deaths and 4 injuries.  4 story building collapsed with excavation of adjoining plot, 10 deaths (5 children), 2 injured | Architect charged with a felony. Gujarat High Court quashed the proceedings on the assumption that since the structure stood for 19 years without problems and survived a major earthquake in 2001, it must have been safely constructed.  2 contractors arrested for death by negligence |
| 6/28/2014 | (Porur) Chennai, India building collapse | | 12 story building under construction collapsed, monsoon rains, 61 deaths, 27 injured. | 2 owners (father and son), 2 engineers, and the structural engineer charged. Total of 8 detained |
| 7/6/2014 | Wall collapse, Tamil Nadu, India | | 20’ high compound wall collapsed on adjacent huts, 11 deaths. | 2 owners of private warehouse company that built the wall arrested. |
| 8/11/2014  9/12/2014 | 6 storey condo complex pancaked, Pathum Thani, Thailand  Church Collapse, Lagos, Nigeria | | Building under construction collapsed, several possible reasons, including design defects and laying of cement on roof without engineer’s permission, 14 deaths, 25 injuries  Synagogue Church of All Nations (SCOAN) collapsed due to structural defects, 116 deaths. Additional floors added without strengthening the foundation, failure to obtain building permit | Warrants issued for seven, arrests include owner, engineer, foreman  116 counts of criminal negligence (involuntary manslaughter) against the Pastor (chair of the church council), church trustees, and 2 engineers, also failure to |
| 1/1/2015 | 7 Storey building collapse, Huruma, Nairobi, Kenya | | Building had been declared unsafe, owner served with 4 day notice of compliance on September 13, 2013, 5 deaths | Owner and architect arrested, officials suspended, possibly indicted |
| 11/4/2015  12/23/2015  1/11/2016 | Sunder Industrial Estate, Lahore, Pakistan  2 story collapse, Srirangam, India  Minya Al-Qamh, Sharqeya, Egypt | | Shopping bag factory collapsed with construction on fourth floor, 53 deaths, including the owner, structure may have been weakened by an earthquake.  4 deaths, 7 injuries  6 storey building collapsed, licensed for 4 stories, owner added 2 floor extensions, Failure to supervise illegal building – drilling next door weakened foundation, 9 deaths, including child and 17 year old | Owner, 2 architects, 2 structural engineers, charged with terrorism, murder, and attempt to murder  4 officials suspended, recommended for prosecution  Four officials suspended and referred to prosecution – Deputy head of MInya Al-Qamh, 2 heads of engineering department and head of coordination administration |
| 3/8/2016 | Lekki Building Collapse Lagos, Nigeria | | Building under construction collapse, 34 deaths and 13 injuries, building height exceeded approval of 3 stories by 2 added stories. | Managing Director/CEO of Lekki Gardens and owner of construction company arrested for manslaughter |
| 4/29/2016  4/29/2016 | 6 storey building collapsed Huruma, Nairobi, Kenya  Mogadishu mosque collapsed, Daynille District, Mogadishu, Somalia | | Apartment complex collapsed, no permission to rent out 119 rooms in 6-storey building, heavy rains, had been earmarked for demolition because declared structurally unsafe, 51 deaths, 136 rescued from rubble, heavy rain, marshy soil  Mosque under refurbishment collapsed during Friday prayers, 15 deaths, 40 injuries  . | 5 arrests, 2 owners, 2 public officials (director of planning compliance and sub-county administrator.  Engineer arrested |
| 7/29/2016  10/30/2016  11/8/2016  12/7/2016  2/1/2017  5/18/2017  7/25/2017  8/28/2017  8/31/2017  10/11/2017  11/23/2017  2/15/2018  3/29/2018  7/17/2018  9/9/2007  6/10/2014  3/31/2016  9/10/2017  5/15/2018  1/28/1922  2/17/2014  12/5/2005  1/2/2006  1/26/2006  2/23/2006  5/18/2000  8/7/2016 | Pune, India  2 storey building collapsed, Wuyand County, Hebei Province, China  10 storey building under construction collapsed, Kisii, Nairobi, Kenya  7 storey building under construction collapsed  6 storey building under construction collapsed, Kanpur City, Uttar Pradesh, India  Llasamaja, Lagos, Nigeria  5 storey Sai Darshan Apartment building collapsed, Ghatkopar, Mumbai, India  16 storey building collapse, Baku, Azerbaijan  117 year old building collapsed, Bhendi Bazaar, Mumbai, India  5-storey building collapse, Kisii Township, Kenya  4 storey building collapse, Bhiwandi, Thane, Maharashtra, India  5 storey building collapse, Bengaluru, Kasavanaahalli, India  3 storey building collapse, Indore, India  2 buildings under construction collapsed, Greater Noida, Shad Beri Village,  Flyover collapse, Gammon, India  Athwalines Bridge collapse, Surat, India  Kolkata flyover collapse, Kolkata, India  Odisha Flyway collapsed  Varanasi Flyway collapse, Varanasi, India  Knickerbocker Theater, Washington, D.C., United States  Busan University of Foreign Studies roof collapse, South Korea  Chusovoy swimming pool, Russia  Bad Reichenhall, Germany  Katowicz Trade Center, Poland  Basmanny Market, Moscow, Russia  Pier 34 collapsed into Delaware River, Philadelphia, United States  Schlitterbahn Waterpark, Kansas City, Kansas, United States | | Concrete slab on 13th floor collapsed in building under construction, permission was for 11 floors, 9 workers died, 3 injured.  Building under reconstruction, hoisting jack was pushing up first floor, 17 deaths, 23 injuries  Officials twice ordered suspension of work, exceeded authorized stories, owner hired unregistered structural engineer, 8 deaths, 40 injuries  Construction workers and families sleeping at time of collapse, 11 deaths  No permission for building, first 5 stories erected in 45 days, 10 deaths, 17 injured  3-storey Building collapse, ignored stop work order, 1 death  Illegal alterations to ground floor, loading beam altered during reconstruction, broke the foundation pillar,17 deaths, 12 injured  Nearly constructed building, foundation designed for 9 stories, no approval for the additional floors, 20 construction workers died  Condemned building collapsed in torrential rains, “unsafe to live” notice was posted, knew building was to be demolished, 33 deaths (3 children)  Unsafe building had been marked for non-occupancy, owner had covered up markings, 7 deaths  Unauthorized 4 storey building collapsed. 4 deaths  Building under construction collapsed, permission granted to build eventhough it violated bylaws, 5 deaths, 18 injures  Car crashed into front of dilapidated hotel near Sarvate Bus Stand, 10 deaths  6 storey building under construction crashed into adjoining 5 storey building, 9 deaths  **B. FLYOVER (OVERPASSES) COLLAPSES**  8 precast blocks caved in, failure to fill the excavation trenches with stones, 2 deaths, several injuries  Flyover bridge collapse, poor design, inferior building materials, 10 workers killed, 6 severely injured  490’ steel span collapsed during construction, at least 27 deaths and 80 injuries, failure caused by faulty design, poor quality of raw materials, and inadequate supervision  Flyway under construction collapsed, 1 death 11 injuries  2 beams collapsed on the flyway under construction, many engineering errors and irregularities in construction methodology, 19 deaths, several injuries   1. **ROOF COLLAPSES**   28 hour blizzard, 28 inches of snow in 3 days, flat roof, 98 deaths, 133 injuries  Roof collapsed during heavy snowfall, defective construction, lax supervision, 10 deaths, 103 injuries  Heavy snowfall, poor quality of concrete, 14 deaths, including 10 children, 11 injuries  Blizzard, heavy snow fall, engineer admitted he failed to calculate the weight bearing load of the roof, 15 deaths, mostly children enjoying Christian school holiday  2’ of heavy snow on roof, incorrect design, changed to cut costs, construction flaws, construction overload of 100%, knowledge building was safe, did not fix buckled beam, had buckled in 2002 under heavy snow, evacuation doors did not open, 65 deaths, 175 injuries  Heavy snow, roof of Moscow market collapsed,  66 deaths, 31 injuries     1. **PIER COLLAPSE**   “Club Heat” Nightclub on Pier 34 overloaded, past design life of 12 years, owner and manager ignored danger signs, 3 deaths, 43 injured     1. **AMUSEMENT PARKS**   170’ tall water slide, 5 year old boy flew off raft, hit metal hoop, decapitating him, 2 adult passengers sustained broken bones, co-owners lacked technical or engineering expertise in amusement park rides, no engineer involved in designing dynamic engineering or slide path design, violation of industry safety standards, 13 injuries in 182 days of operation, operations manager covered up incident reports and destroyed witnesses written statements | 2 engineers arrested.  Suspects taken into custody  Owner and engineer charged with 8 counts of manslaughter  Owner, 2 sons, civil engineer, mason arrested for death by negligence  Owner absconded, charged with culpable homicide not amounting to murder, several officials, including engineers, suspended  Developers to be prosecuted  Owner, contractor, architect arrested for culpable homicide  CEO of construction company, brother, 2 construction managers arrested, as well as head of Baku City Department for Apartments and COOP Buildings  Officials of Saifee Burhani Upliftment Trust arrested, culpable homicide not amounting to murder  Developer/owner charged with 7 counts of manslaughter  Case filed against missing building owner  Owners aide/realtor and daughter arrested, Bruhat Bengaluru Mahanagara Palike Executive Engineer arrested for no-objection approval of building plan, daughter released, owner absconded  Building owner arrested  4 arrests, including landowner, culpable homicide, Officer on Special Duty in Great Noida development Authority removed from post, 2 other officials, project manager and assistant project manager, suspended for dereliction of duty  6 arrests, including 2 construction company employees and government officials  18 arrested for culpable homicide not amounting to murder: 4 directors of construction company, 3 engineers in municipal engineering department, 5 engineers of consulting firm, bridge designer, construction company, project management consulting firm  IVCR Construction Company and 8 company officers, including the associate vice president, and project manager (engineer in charge of construction), charged with murder, attempted murder, and criminal conspiracy. Murder charges subsequently reduced to culpable homicide not amounting to murder  4 arrests, director, managing director and project manager of Panda Infra Project, assistant engineer in works department, deputy executive engineer in works department, charges are culpable homicide, causing hurt by an act, endangering life or personal safety, causing grievous harm  8 arrests, including project managers, engineers and contractor  Richard Geare, architect, indicted for manslaughter, committed suicide in 1927  2 officers of building’s operator and 4 involved in the construction arrested  Chief engineer received 14 years for falsifying documents  Building laws amended after disaster  Building engineer and architect acquittal, structural engineer convicted of six  arrests, Chairman of International Katowice Fair Board, Deputy Chairman, Technical manager for criminal negligence, 3 architects, 2 for willfully causing a building collapse, 1 unlawfully causing a building catastrophe, 7 other indictments for gross negligence, county building inspector, technical coordinator pled guilty  Director of the market arrested for negligence leading to death  Owner and manager charged with 3rd degree murder, after hung jury owner pled guilty to involuntary manslaughter and reckless endangerment, manager pled no contest to involuntary manslaughter, reckless endangerment, conspiracy, and risking a catastrophe  Co-owner, ride designer, operations manager and corporation indicted, co-owner charged with involuntary manslaughter, designer on second -degree murder, aggravated battery and aggravated endangerment of a child, corporation and operations manager on involuntary manslaughter |

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| **II. ENVIRONMENTAL** | | | |
| 1919–1990 | Vermiculate mine in Libby, Montana, United States | The vermiculate in the mine contained asbestos; no warning provided the miners or the town residents either by the original mining company or W.R. Grace Co., the successor company | The company and 7 executives were indicted for violations of the Clean Air Act for discharging asbestos into the air, knowingly endangering the residents of Libby, and concealing information of the health risks.  No individual defendant was convicted. |
| 1932–1968 | Minamata, Japan | Chisso Corporation discharged 27 tons of mercury into Minamata Bay. Symptoms appeared in 1953 of mercury poisoning. 1,760 verified victims, thousands of claims denied – became known as Minamata Disease. | President and a senior executive were convicted in March 1979 of pollution – sentenced to 2 years in prison. Neither served time before their deaths. |
| 1970’s – 1990’s  1978–1996 | Great Britain and South Africa  Italy | Mercury poisoning to workers and communities from Thor Chemical plants in Great Britain and South Africa, several victims of mercury poisoning including 3 deaths in Great Britain  Workplace exposure to asbestos at Oliveti. | Great Britain filed culpable homicide and violations of the Machinery and Occupational Safety Act against Thor, which pled guilty to lesser charge of negligence, fines R14,000  Former CEO and 12 others convicted in 2016 for manslaughter for worker deaths and injuries. CEO sentenced to 5 years and 2 months imprisonment, a former industry minister to 23 months on charges of complicity, and 11 other managers also received sentences on July 18, 2016. |
| 12/2/1984–3/1984 | Bhopar, India | Toxic chemical leak (methyl isocynate) at Union Carbide subsidiary in Bhopar, India. 7,000 – 10,000 residents perished with hundreds of thousands incurring health problems in successive years. | Seven India executives sentenced 26 years after the tragedy on June 7, 2010 to 2 years for death by negligence, still out on bail during appeals. The President of Union Carbide of the United States and 12 Indian employees were originally indicted. The United States executive left India after posting bail, never to return. Union Carbide charged with culpable homicide not amounting to murder. |
| 2001–2011 | Oxy Humidifier Sanitizer, South Korea | Oxy Sanitizer sold by Korean subsidiary of Reckitt-Benckiser was toxic; no toxicity tests performed. Over 100 deaths from Oxy, hundreds with permanent lung damage. | 4 South Korea execs charged with negligence. The arrested include the former CEO of the Korean subsidiary in May 2016 for homicide through negligence. Two university professors indicted for manipulating toxic data, former head of company sentenced in 2017 to 7 years in prison for accidental homicide and advertising the product a safe for children, several officials of the research and development department sentenced to prison terms between 5 and 7 years, CEO of company acquitted  South Korea is getting away from the laissez-faire approach to companies |
| 2008 | Contaminated milk, Hebei Province, China | “Melamine-laced protein powder” added to fresh milk. At least 6 infants died, 262,662 sickened, 891 seriously ill. | 2 defendants sentenced to death. |
| 2/13/2012 | Italy | Asbestos exposure in workplace, over 2,000 deaths. | The Swiss and Belgium owners of Eternit sentenced to 16 years for manslaughter in the workers’ deaths and illnesses. The conviction of the Swiss executive was overturned on statute of limitations grounds. The Belgium defendant died before the appeal was decided. |
| 1/4/2014 | Charlestown, West Virginia, United States | Chemical storage tank leaked into Elk River and thence entered the intake pipes of the water company contaminating the drinking water of seven counties. No deaths and no severe health risks (to date). | Criminal charges filed against the company and 6 executives, owners, former owners, and employees. All pled guilty. |
| 4/25/2015–10/16/2015 | Flint, Michigan, United States | Flint switched water supply from Lake Huron and the Detroit River to the Flint River. The new source was highly corrosive, but the city failed to apply an anti-corrosive chemical, resulting in elevated lead levels in 6,000 – 12,000 children from lead released from the old pipes. | 9 government officials, 8 state and I local, indicted, several for covering up and filing false statements. The city Water Plant Operator agreed to plead guilty to filing false information and cooperate with the investigators. The retired director of the Department of Health and Human Services Bureau of Epidemiology pled guilty to neglect of duty – she allegedly suppressed information about the lead poisoning of the children |
| 5/16/2015  11/23/2015-2/18/2016  2015–2016  6/15/2017 | Sulphuric acid spill, Nyl River, South Africa  Natural gas leak, Porter Ranch, California, United States  Running Tracks, China  Toxic waste discharge, Wuji County, Shijaiazhuang City, Hebei Province, China | Truck carrying 28,000 liters of sulphuric acid overturned, dead fish, farmers had to stop irrigating their farms and had to move their cattle, 4 hour delay in emergency response  Natural gas utility stored natural gas in exhausted oil field near Porter Ranch, safety valves on the wells were removed in 1979 and not replaced. Leak developed, releasing 97,000 tons of methane and 7,300 tons of ethane before being capped, no long term injuries yet, but numerous short term complaints about nausea, nose bleeds, and headaches, over 4,500 households temporarily relocated  Toxic waste (benzene, formaldehyde) recycled as school running tracks; children suffered nose bleeds, headaches, allergies, irritated eyes and skin.  Illegal dumping of hydrochloric acid, toxic fumes, 5 workers died and 2 injured | Criminal charges of negligence against heads of disaster management of Modimolle and Waterberg Municipalities and Waterberg Fire Chief  Los Angeles County filed 4 misdemeanor charges against the utility, which pled guilty to misdemeanor to one count of failure to immediately notify the Los Angeles County Office of Emergency Services and the County Fire Department – fined $4 million and agreed to numerous safety improvements  9 factories closed, several officials detained.  Representatives of three chemical companies arrested |

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| 1. ***Explosions***   **III. EXPLOSIONS AND FIRES** | | | |
| 3/31/1972  5/13/2000  9/21/2001  12/30/2003  3/23/2005  4/8/2011  9/5/2012  11/1/2013  8/2/2014 | Fireworks factory/warehouse exploded, Bridgewater, Massachusetts, United States  Fireworks factory explosion, Enschede, Netherlands  AZF Chemical plant explosion, Toulouse, France  Fireworks factory explosion, China  BP refinery explosion, Texas City, Texas, United States  Waikele fireworks explosion, Hawaii  Fireworks factory explosion Sivakasi, India  Fireworks factory explosion, Cenxi, Guangxi, China  Auto parts plant explosion, Kunshan, Jiangsu, China | Unprecedented level of fireworks storage (4,000-5,000 shells), high risk, cause of explosion not known, 3 employee deaths  Fire and explosion at S.E. Fireworks, factory in middle of residential area, lack of safety measures, lighting conductors, emergency escape routes, safety construction, doors left open, 22 deaths, 400 homes destroyed, over 1,250 left homeless  300 tons of ammonium nitrate exploded, theory was that ammonium nitrate was negligently mixed with chlorine, 31 deaths, 2,500 injured, 30,000 homes damaged  37 deaths  Numerous safety violations, poor maintenance, 15 employees died, over 170 injured  Company hired to manage and dispose of 28 pallets of commercial grade fireworks, explosion ruled accidental, 5 workers died  Explosion at fireworks factory a few days after license suspended for violations of worker safety rules, 40 deaths, over 70 injuries  Workers assembling fuses for fire crackers, 11 deaths, 17 injured  Room filled with metal dust, 146 deaths, 114 injuries | President of company, Inter state Pyrotechnics, Inc., convicted of 3 counts of manslaughter  Two directors sentenced to one year in prison for liability resulting in death, Andre de Vries, who started the fire, sentenced to 15 years  Plant chief sentenced to 3 years, 2 suspended, 11 years after the explosion, company fined €225,000  Owner arrested after fleeing  BP pled guilty and paid fines and penalties to violations at multiple facilities and practices, 1 count Clean Air Act Violation ($50 million and 3 years probation) and 1 count Clean Water Act ($20 million)  12, including factory manager, charged with culpable negligence, company owner fled  Company, company owner and project manager indicted for conspiracy, storing, and treating hazardous wastes. Company and owner acquitted in 2017. Project manager pled guilty prior to trial for improperly storing explosives  12 arrests, including factory manager, for culpable homicide, owner fled  2 factory executives detained  3 arrests, chairman, chief executive officer and manager of workplace safety |
| 3/26/2015  8/12/2015  8/31/2015  4/10/2016  10/27/2017 | Gas explosion, New York, New York, United States  Warehouse explosion, Tianjin, China  Shandong Binyuan Chemical plant explosion, Lijin, Shandong, China  Puttingall Temple, Kerala, India  Tangerang Fireworks Factory, Kosambi, Indonesia | Explosion from illegal natural gas line installed and concealed from inspectors by landlord, 2 deaths, 25 injuries, and 4 buildings destroyed  ```````  Fire and explosions at Tianjin Ruihai International Logistics Warehouse. An estimated 3,000 tons of toxics stored – 1,300 tons of ammonia nitrate and potassium nitrate, also present 700 tons of sodium cyanide. Spontaneous ignition of overly dry nitrocellulose stored in over-heated container, Facility was within 650 meters of an upscale residential complex. China law requires at least a 1,000 meter distance. Culture of mismanagement, operated without licenses in several months, industrial safety rules violated, improperly stored chemical became dry and ignited, 173 deaths, including 110 first responders (99 police, 11 firefighters) , over 797 injuries, 304 buildings damaged, 12,428 cars destroyed, $1.1 billion in economic losses  13 deaths, 25 injuries  Errant fireworks ignited a cache of fireworks, resulting in explosions, fires, and a building collapse at 3:15am at the 100 year old Puttingal Temple, which was denied a license to conduct the fireworks, but proceeded anyway, 116 deaths, 383 treated in hospitals, temple and 150 houses damaged, one of the contractors perished in the accident  Sparks from welder’s torch at PT. Panca Buana Cahaya Sukses fireworks factor set off explosives, only 1 exit gate, which was locked, trapping workers. Company registered as toy factory – not fireworks factory, Permit for packaging – not producing fireworks, Company registered as a toy company – not fireworks manufacturer. Permit limited employment to 10 workers instead of the 103 at the site, underage workers, wage standards violations, 49 deaths, 46 injured | Owner/landlord, son, contractor, unlicensed plumber, and a fifth defendant (who loaned master license to unlicensed plumber) charged with 2nd degree manslaughter  Verdicts from 10 courts in 3 days, 49 jailed, 25 government officials and 24 company employees, chairman of warehouse company sentenced to death with a 2 year reprieve (bribed port officials), 125 held responsible, 11 officials negligent in supervisory role, former head of State Administration of Worker Safety accused of accepting bribes in his former position in Tianjin  12 company executives and employees detained, as were 11 government officials  16 arrested, including president and 6 other members of the temple’s managing committee, other defendants are assistants and employees of the contractors , preliminary charges are attempt to commit culpable homicide and violations of the Explosive Substances Act  Factory owner, operations manager and a welder arrested on suspicion of negligence |

3/8/2018 Ramdeo chemical Inadequate safety training of employees and Factory owner, manager, chemist, and

plant explosion and failure to ensure their safety, 4 deaths, 14 worker-supervisor arrested

fire, Boisar-Tarapur injured

Industrial Estate,

Maharastra, India

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| 1. ***Building Fires*** | | | |
| 3/2/1911  12/25/1971 | Triangle Shirtwaist Factory, New York, United States  Skyscraper fire, Seoul, South Korea | 146 workers died and 71 injured during fire when trapped by locked doors on floors 8–10.  22 story, 222 room luxury Daeyeonggak Hotel caught on fire, poor design, two internal staircases not designed as fire exits, no external emergency exit, walls between rooms insufficiently fireproofed, fire department ladders only reached to 8th floor, people on 9th – 22nd floors trapped, 164 deaths, 63 injuries | Two owners acquitted of 1st and 2nd degree manslaughter.  Major changes in worker safety protection in United States.  5 hotel officials, 2 former city officials and 1 fire official arrested |
| 9/3/1991 | Hamlet Poultry Plant  Hamlet, North Carolina, United States | 5 workers died, 55 injured when trapped in poultry plant with doors locked and windows boarded up. | Owner pled guilty to 25 charges of negligent manslaughter; served 4 years; charges dropped against son and plant manager. |
| 11/19/1993  6/3/1999  10/29/2002  7/16/2004  1/7/2008  12/7/2008  2/8/2009 | Zhili Toy Factory Fire, Shenzhen Special Economic Zone, China  Sealand Youth Training Center fire, Hwaseong, South Korea  International Trade Centre fire, Ho Chi Ming City, Vietnam  Lord Krishna School fire, Tamil Nadu, India  Cold storage warehouse  fire, Incheon, South Korea  Cold storage warehouse fire, Incheon, South Korea  CTV Headquarters, China | 3 storey toy factory caught on fire, locked exits, factory and dormitory windows covered with iron bars, 87 workers died, 47 injured  One story approved youth center was expanded to three floors with 54 cargo containers and flammable Styrofoam, no sprinkler system, mostly inoperable fire extinguishers, no fire alarm, fire at 12:30am, 19 children and I adult died  Welding sparks started fire on second floor,  Primary school thatched roof caught on fire, overcrowded school, building laws not followed, not inspected in 3 years, no emergency exits, teachers not properly trained, 94 children died  Several explosions caused fires in underground refrigerator storage depot under construction, sprinklers and other safety equipment disabled to prevent being accidentally switched on, welder ignited fumes not cleared from earlier maintenance blocked emergency exit, 40 deaths  Fire safety regulations unenforced, structure full of highly flammable materials, blocked emergency exit, non-existent or malfunctioning firefighting equipment, water sprinklers did not work, 7 deaths, 5 injuries,  Fireworks on Lunar New Year landed on roof, engulfing adjoining Mandarin Hotel, I firefighter dead and 6 injured. | 2 owners received short prison terms of 9 months for bribing inspectors  Owner and 6 Hwaseong council members charged with involuntary manslaughter, building code violations, and bribery, Kindergarten head, wife, and a teacher also charged with involuntary manslaughter, 4 architects and builders also arrested  2 welders, supervisor, and employer sentenced to 2-7 years,  21 initially accused, charges against 17, two year trial began in 2012, school founder sentenced to life imprisonment, 10 defendants received 5 years, accused included 3 teachers, 6 officers of education department, 2 administrators, 2 kitchen workers, charter engineer sentenced to 2 years and Rs50,000 fine -Court suspended his punishment, 11 acquitted  Arrest warrants for three managers  2 welders arrested for manslaughter by gross negligence  20 arrests, including CCTV officials, head of construction, 3 CCTV staffers, driver who transported the explosives, 4 persons who guided the explosives past police checkpoints, 8 employees of fireworks company, 71 held responsible |
| 11/15/2010  9/11/2012 | 28 story high rise apartment building fire, Shanghai, China  Ali Enterprises garment factory fire, Baldia, Karachi, Pakistan | Unlicensed welders caused a fire, 58 deaths, over 70 injured.  Investigations revealed that the fire at the multi-story garment factory may have been caused by arson due to failure of owners to pay extortion to the Muttahida Quami Movement (MQM), could also have been a short circuit, workers trapped, 259 factory workers perished and over 600 injured, trapped behind locked exit doors, most windows barred, 2 inspectors had certified it safe the month before the tragedy | 13 welders and construction company officers arrested as well as 3 local government officials.  3 factory owners and 12 others prosecuted, including those responsible for the arson. The special prosecutor resigned in February 2015 for lack of police cooperation, all charges ultimately dropped, Sindh Minister for Industry and Commerce resigned |
| 11/12/2012  6/2/2013 | Tazreen Fashion Factory, Dhaka, Bangladesh  Jilin Baoyuanfeng Poultry Slaughterhouse, Jilin, China | 113 fatalities and over 200 injured in garment factory fire  121 deaths with 76 injuries; workers trapped in plant with emergency exits blocked; numerous safety violations. | Charges filed against the co-owners, factory manager, an engineer, and 9 others, little progress five years later  Chairman sentenced to 9 years, general manager 4 years, fire chief and deputy jailed, 74 officials received disciplinary sanctions, 11 local officials also arrested, 35 government officials and company executives were transferred to judicial authorities for prosecution. |
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| 4/23/2014  12/6/2014 | Landmark Empire Textile Complex, Sarat, India  Geyland Road, Singapore | 2 dead, 19 injured in fire, violations of building code and fire safety regulations  Fire in overcrowded shop house, 4 deaths, 8 injuries | Developer, president and secretary of the complex arrested for “culpable negligence not amounting to murder” for building code and safety violations. Charges dropped because plans were approved by the fire department and municipality.  3 directors and their companies fined in June 2018 $150,000 for housing foreign workers in the overcrowded shophouse |
| 5/13/2015 | Kentex Slipper Factory, Philippines | 74 workers died when trapped by iron bars; numerous fire, labor and safety code violations, but officials issued certificates and allowed it to operate. | Owner of company, the Mayor, and 6 other officials arrested. |
| 5/21/2015  10/17/2016  1/19/2017  2/6/2017  3/8/2017  12/21/2017  12/23/2017  12/29/2017  3/25/2018  5/23/2018 | 16 story apartment house fire, Baku, Azerbaijan  SUM Hospital fire, Bhubaneswar, Odisha, India  Plasco Building fire and collapse, Tehran, Iran  Zuxintang Foot Massage Fire, Tiantai County, Zhejiang Province, China  Orphanage fire, San Jose Pinula, Guatemala  Sports center fire, Jecheon, South Korea  Mall fire, Davao City, Philippines  Kamala Mills Fire, Mumbai, India  Window Cherry Mall Fire, Kemerovo, Siberia, Russia  Fireworks explosion, Baldrans, Galicia, Spain | 12 died, dozens injured when building caught fire. Owner ignored warnings,  Short circuit caused hospital fire, which swept through the dialysis and intensive care units, 25 deaths, 122 injuries  Famous 17-storey caught on fire and collapsed, unauthorized and non-standard wiring, electrical, heating systems and fire safety regulations not up to standard, 26 deaths, including 16 firefighters  18 deaths, 18 injured  51 girls locked in a 17’ x 17’ room following protests, riots and escape attempts the day before, cause of fire unknown, police guarding the room did not let the girls out, 41 girls, aged 14-17 died. History of abuse and mistreatment at the facility  Fire in 8 story Duson Sports Centre, shoddy construction, multiple safety lapses, sprinkler system on first floor inoperative, stairwell and fire exit filled with shelves and supplies, emergency exit blocked by iron shelves, automatic door on main entrance broken, 29 deaths, 36 injuries  Fire engines had trouble reaching the sire because of double parking on the street  New City Commercial Center mall caught on fire, numerous fire code violations, problems with sprinkler system, alarm system, and emergencies exits, fire alarm system not connected to the office with the most fatalities 39 deaths, 61 injuries  Flying embers from a hookah ignited fire in 1Above rooftop restobar and spread to next door Mojo’s Bistro Pub, no emergency exits or working fire safety equipment, flammable materials, 14 deaths, 54 injuries  Fire in shopping center, fire spread to top floor of mall with a children’s playground, ice skating rink, and a cinema, ire alarm system  inoperable, emergency exits locked, security guard turned off PA system and was among first to flee, 64 deaths, including 41 children fire alarm system, and the private security guard,  Fireworks illegally stored in home, 1 death, 26 injures (including 7 children), 1o homes destroyed | Construction company head arrested for using flammable cladding.  Owner, hospital administrator, fire safety officer, 2 electrical division workers arrested for homicide not amounting to murder and negligence, Odisha Health Minister resigned  2 arrests for negligence in handling property  4 managers arrested on suspicion of “very serious dereliction of duty”  Secretary of Social Welfare, Deputy Director, former director of the shelter charged with wrongful death, negligent and mistreatment of minors, 2 police officers also charged, 5 more subsequent arrests – child & adolescent advocate for human rights, head of the attorney general’s office for children and adolescents, head of the department of special protection, and the Deputy Commissioner and Inspector of the National Civil Police Force  Owner charged with involuntary homicide by negligence and violating fire safety regulations, manager charged with involuntary manslaughter  Eight Bureau of Fire Protection charged for issuing a fire safety inspection certificate and failure to meet statutory fire code requirements  Charges against 3 directors and manager of 1Above, culpable homicide not amounting to murder, government subsequently pulled down illegal extensions of 314 restaurant-pub bars and hookah parlours, and sealed 7 restaurants for gross violations  Seven arrests, including head of regional construction inspection agency, general director of mall owner, head of company servicing the fire alarm system, and the private security guard  Regional governor resigned  Owner of fireworks company arrested for manslaughter |

1. ***CIRCUS TENTS***

7/6/1944 Ringling Brothers & Fire, believed to be arson, canvas tent Suspect never charged, but 5 officers and circus

Barnum & Bailey Circus “waterproofed with 1,88 ponds of paraffin employees charged with involuntary manslaughter

Hartford, Connecticut, dissolved in 6,000 gallons of gasoline, 4 convicted in 1944 and then pardoned

United States at least 2 exits blocked by chutes, estimated

7,000 in attendance, 187 deaths, over 700

injured

12/17/1961 Gran Circus Notre New tent coated with highly flammable 3 convicted of arson, but many believe that was a

America fire, Niteroi, paraffin wax, over 500 fatalities coverup of electrical causes

Brazil

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| 1. ***Nightclubs, Concerts, and Theaters*** | | | |
| 11/28/1942 | Cocoanut Grove Nightclub Fire, Boston, Massachusetts, United States | Fire quickly spread through the nightclub. 492 fatalities with hundreds injured. 1,000 were crowded in a facility with a capacity of 460. Exits were locked. | Owner convicted of 19 counts of manslaughter – sentenced to 12–15 years in prison, pardoned after 4 years.  Building and safety codes changed after the disaster. |
| 11/1/1970  11/3/1974 | Club Cinq-Sept Fire, Saint-Laurant du-Pont, France  Hotel night club fire, Seoul, South Korea | Discarded match caused fire. Exits locked, numerous fire safety violations. No firefighting equipment on premises. No emergency exit. 146 deaths.  6th floor hotel guest fell asleep in bed while smoking, fire spread at 3:00am to rooftop 7th floor nightclub. Nightclub with 200 patrons should have closed at 2:00am, locked exits – didn’t want patrons to leave without paying bills, 88 deaths | Club manager received 2 year suspended sentence for manslaughter. Mayor and three building contractors received short suspended sentences for injury through negligence.  Mayor and Secretary-General of the Isere Department removed from posts 3 days after tragedy.  Several regional authorities fired |
| 12/8/1994 | Concert hall fire, Karamay, China | 323 deaths, mostly children. Delays in evacuating the children | 19 arrested, including vice mayor, 13 received jail sentences. |
| 3/18/1996 | Ozone Disco Club, Quezon City, Philippines | 162 deaths, government officials issued safety permits without visiting the club. | 7 Philippine safety and 2 club execs sentenced to 6 to 10 years imprisonment, 18 years after the fire. |
| 10/29/1998 | Gothenburg Disco Fire, Gothenburg, Sweden | 63 deaths, 213 injured. 4 teenagers started fire because excluded from club, overcrowded with 375 patrons in venue with capacity of 150. Upstairs fire on stairway blocked emergency exit. | 4 teenagers convicted of aggravated arson. |
| 9/21/2001  2/20/2003 | AZF (Total)  Factory explosion,  Toulouse, France  Station Nightclub, West Warwick, Rhode Island, United States | 31 deaths, 2,500 wounded, 30,000 homes devastated in ammonium  nitrate explosion. Court of Appeals held explosion was caused by accidental mixing of two chemicals  100 dead, 230 injured, tour manager’s pyrotechnics ignited flammable sound proofing; illegal use of outdoor pyrotechnics indoors; erroneous belief that fire sprinkler system not required; 462 in club with capacity of 404; numerous code violations. | 13 plant employees originally charged with negligence, Plant chief sentenced to three years, two suspended, and fined €45,000 11 years after the explosion, Subsidiary fined €225,000, for negligence causing death, injury, and damage, Supreme Court of France in January 2015, ordered a new trial  Road manager pled guilty to 100 counts of involuntary manslaughter, served 2 years of 4 year sentence; 2 owners pled “no contest” to involuntary manslaughter; one served almost 3 years; the second received a suspended sentence.    The National Fire Protection Association (NFPA) revised its code to require sprinkler systems in all night clubs with a capacity of 100 or over. |
| 12/30/2004 | Republica Cromanon, Buenos Aires, Argentina | Audience member threw pyrotechnics into the air, igniting a fire, 194 deaths, over 1,400 injured. Crowd of 4,000 in a venue with a capacity of 2,000. Emergency exits blocked from outside. Had permit, but lacked safety measures, including fire extinguishers. | 6 band members convicted of murder in April 2011, sentenced to 7 years in prison. Sentences reduced in 2014.  Also convicted were the former manager, police officer, and several municipal officials. The club owner received 20 years in prison and the manager 18 years. 2 government officials received 1 and 2 year sentences.  The Mayor of Buenos Aires lost his job. |
| 9/1/2008 | Wu Wang Club Fire, Shenzhen, China | 44 dead, 89 injured when pyrotechnics ignited the ceiling. | 23 detained, 13 arrested: district, police, and fire staff. Club GM, Vice GM, co-founder, safety officer, technician, performers charged with negligence and violation of safety rules. |
| 1/1/2009  2/9/2009 | Santika Club Fire, Bangkok, Thailand  Beijing Television Cultural Center fire, China | Fire swept through club; 66 killed, 222 injured; substandard safety system; only one fire extinguisher; one main exit, one private staff exit, third exit locked to prevent robberies, no fire safety inspection, co-owner was a senior police official.  Last day of Lunar New Year celebrations, Fireworks at adjoining CCTV fell on roof of building under construction, illegal fireworks, firefighter killed 7 injuries, including 6 firefighters | Pub owner and light and sound company owner convicted of negligence; conviction of pub owner reversed, but then convicted of excise tax violation – 1 year sentence.  20 arrests, 71 held responsible, head of construction of CCTV HQ site, 3 CCTV staffers, driver who transported the fireworks, 4 persons who guided the shipment to bypass police checkpoints, 8 employees of fireworks company |
| 12/5/2009 | Lame Horse Nightclub, Perm, Russia | Performer tossed pyrotechnics into the air, igniting fire, one exit door, 156 deaths, about 160 injuries, 2003 fire safety compliance report signed by an inspector dismissed in 2002. | Co-owner, executive director, caretaker director, director of pyrotechnics prosecuted. 4 defendants received at least 4 years imprisonment. Fire official fined; 7 officers of Perm Fire Department dismissed; Perm Provisional government resigned; nationwide inspection of nightclubs – scores closed. |
| 2/19/2012 | Nightclub, Sighetu  Marmatiel, Romania | Natural gas explosions in nightclub; 1 fatality, 20 injured, including 10 members of inspection team. | 11 prosecuted, including former VP of National Agency for Energy Regulation; the charges include manslaughter, forgery, and abuse in service. |
| 1/27/2013 | Kiss Nightclub, Rio Grande do Sol, Brazil | Indoor use of outdoor pyrotechnics ignited the nightclub; 242 fatalities, at least 630 injured. | Two co-owners and 2 band members charged with negligent homicide.  58 nightclubs were inspected and closed the next day. |
| 6/27/2015 | Formosa Fun Coast, Bali, New Taipei, Taiwan | Combustible color powder caught fire at water park festival, 15 deaths, 508 injuries, 199 critical. | Event organizer charged with negligence. |
| 10/30/2015  12/2/2016 | Colectiv Nightclub, Bucharest, Romania  Ghost Ship Fire, Oakland,  California | Indoor use of outdoor pyrotechnics ignited flammable foam on pillars; 64 deaths, 147 injured.  Tenant converted warehouse to residences and  Performance space, ran as artist coop, but not zoned for residential, numerous safety violations  Warnings of dangerous situation, but filled warehouse with flammable materials, 1 of 2 exits is blocked, Dance party on second floor when fire stated, 36 deaths | 2 co-owners of nightclub and 2 associates arrested for negligent homicide, negligent bodily harm, and negligent destruction.  The Prime Minister resigned. Over 1,000 establishments inspected throughout Romania after the tragedy; several closures and suspensions.  Tenant and event planner arrested on 36 counts of involuntary manslaughter. They pled no contest on July 3, 2018 |

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| 1. ***Bridges***   **IV. INFRASTRUCTURE** | | | |
| 10/21/1994  7/14/1997 | Seongsu Bridge Collapse  Seoul, South Korea  Maccabiah Bridge Collapse, Tel Aviv, Israel | Bridge collapsed due to poor welding, 32 deaths and 17 injuries.  Temporary pedestrian bridge over Yarkon River for Maccabiah Games collapsed, company had never designed nor built a bridge before, subcontractor not licensed to build bridges, used substandard materials , “rusty” metal pipes bound together with wires, 4 deaths, over 70 injuries, victims included serval athletes from Australia, 1 death in collapse, 3 from infections contracted in the contaminated waters | 7 Seoul government officials arrested for involuntary manslaughter.  Seoul Mayor dismissed from office.  South Korea President publicly apologized to the Country.  Inspection of 14 Seoul bridges and the subway system found 1,114 flaws in the bridges and 330 in the subways.  Safety statute enacted.  Five convicted of recklessly causing death, engineer who designed bridge, head of construction company, contractor (jail time), 2 sub-contractors (jail time) |
| 1/4/1999 | Rainbow Bridge Collapse  Qijiang County, China | 3 year old, poorly designed pedestrian bridge collapsed; 40 deaths and 14 injuries. | Former Deputy Secretary of the County Communist Party Central Committee sentenced to death for bribery ($15,700) and dereliction of duty. 12 others, including the contractor, engineer, materials supplier, and several government officials received sentences ranging from 3 to 13 years.  Over 300 structures inspected with 47 shut down. |
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| 8/28/2003  8/13/2007 | Daman Bridge Collapse, Mumbai, India  Dixituo Bridge Collapse, Fenghuang, Hunan Province, China | 100 year old dilapidated building collapsed in heavy rain, vehicles and pedestrians fell into raging river, 25 deaths, including 22 school children, 8 missing, 25 injured  Bridge under construction over Tuojiang River collapsed, at least 64 deaths, 22 injured. | Charges of culpable homicide not amounting to murder quashed by Bombay High Court against 2 engineers in 2013, but continued charges of causing death by negligence  2 officials of state-owned construction company detained. Construction manager and project supervisor. |
| 9/1/2007 | Shershah Bridge, Pakistan | Bridge collapsed 6 months after dedication by President, 5 deaths, 14 injuries | 9 charged, including chairman and former chairman of the National Highway Authority (NHA), general manager, general manager for construction, a member of NHA Planning, the owner of the contract engineering firm and his 2 sons  9 acquittals 5 years later for lack of proof of negligence |
| 9/26/2007 | Can Tho Bridge, Vietnam | Approach ramp collapsed, 1,500 – 2,000 tons collapsed, did not meet safety standards, scaffolding removed early, 54 deaths, 80 injures  . | Charges against some sub-contractors. 2 companies barred from future construction projects |
| 11/9 /2007 | Bridge collapse in Dubai | Bridge under construction collapsed, 7 employees of construction company died, 24 injured, overloading concrete and heavy iron rods. | Arrests include project manager, project engineer, worker supervisor and assistant, safety and security officer, crane operator, and crane pusher |
| 3/8/2008  5/20/2009  11/26/2011  3/25/2012 | Amroli Bridge Collapse, Surat, India  Viaduct collapsed, Hunan Province, China  Mahakam Bridge collapse, Tenggaron, Indonesia  Tehri District, India | 1 laborer killed, 12 injured in collapse of bridge span under construction, iron structure used to support the bridge’s concrete slab was not properly placed  Viaduct under demolition collapsed, 9 deaths, 16 injured  Bridge buckled and collapsed, 24 deaths, over 30 injured  Bridge under construction at Chauraus over Alakananda River collapsed, 7 workers and junior engineer died. | Complaints registered against building engineer, junior engineer, and labor company supervisor, and the deputy engineer, junior engineer and technical supervisor of the Surat Municipal Corporation  Nine arrests, general manager of civil explosion company, deputy general manager, head labor contractor, and six workers and supervisors, 3 officials removed from office  District infrastructure chief, technical executor of project and project manager of the construction company arrested, sentenced to 1 year in prison  2 civil engineering professors at India Institute of Technology – Roorkee arrested 3 years later (designers of bridge), Owners of construction company also arrested. |
| 6/28/2012 | Pedestrian Bridge collapse, Lahore, Pakistan | Truck crashed into pedestrian bridge, 3 year old bridge collapsed, 2 deaths, including driver. | Construction company president arrested, charged with murder. |
| 2/2/2013 | Bridge Collapse, Henan Province, China | Truck carrying fireworks exploded on expressway viaduct, which collapsed, 10 deaths and 13 injuries. | 10 suspects detained for illegal manufacture, trading, and transportation of explosives. |
| 2/6/2013 | Mumbai bridge collapse,  India | Bridge under construction connecting the Western Express Highway and Mumbai Airport collapsed, 3 deaths, 6 injuries. | Contractor and 2 supervisors of construction company arrested. |
| 7/9/2013 | Panjiang Bridge, Sichuan Province, China | Bridge collapse, 6 deaths and 5 missing when 6 vehicles plunged into river after completion of bridge restoration project, shoddy construction, illegal sub-contracting, unlicensed operations, slack supervision, improper inspection, bribery. | 60 people, 17 organizations investigated; former director of urban construction office of Jiangyou Township received 14 years for malpractice and bribery, 2 former traffic managers received 4 years, 3 people with contractor received 2½ to 7 years for offering bribes, highway division chief committed suicide. |
| 2/24/2014 | Chu Va 6 Bridge Collapse, Vietnam | Bridge collapsed when funeral procession moved across it; poor quality materials, disregard of design and technical protocols, 8 deaths, 39 injuries, faulty turnbuckles and other technical errors. | Director of construction company sentenced to 10 years, deputy head of project management unit received 3 years as did a technician at the unit. |
| 5/4/2014  3/20/2016 | Bridge collapse, Guazhou, China  Ghenh Bridge collapse, Bien Hoa, Vietnam | Illegal stone arch bridge collapsed under construction, 11 deaths  Tugboat with barge crashed into bridge, collapsing it, people fell into river, but saved | 4 detained, village committee director, township officer, and two from construction company  Captain and crew member detained |
| 1. ***Dams*** | | | |
| 10/9/1963  7/19/1995  2/22/1999  3/14/2006  9/8/2008  12/30/2013  6/8/2014  9/8/2015  11/19/2015 | Vajont Dam, Italy  Stava Tailings Dam, Trento, Italy  Merriespruit Dam #4, Merriespruit suburb of  Virginia, Free State, South Africa  Kaloko Dam Failure, Kauai, Hawaii, United States  Iron ore tailings pond collapsed, Shanxi Province, China  Bosveld Phosphate tailings dam, Selati River, Kruger National Park, South Africa  Larji Dam, Himachal Pradesh, India  Tailings dam failure, Xiangfen County, Shanxi Province, China  Germano tailings dam failure, Mariana, Brazil | Power company dam, massive rock landslide sent a wave of water downstream, 1917 deaths, communities wiped out. Design problems; warning signs ignored  Tailings dam failed, numerous design and safety violations. No serious stability checks for over 20 years, 68 deaths, 3 hotels, 53 homes, 6 industrial buildings and 8 bridges destroyed  Gold waste tailings dam failed, toxins flowed downstream, 17 deaths, 80 homes destroyed, widespread destruction. Judge described the dam as a time bomb waiting to explode, numerous warnings prior to failure  Dam failure through poor maintenance, 7 deaths  Illegal mine tailings dam burst after torrential rainfall, inundated village of Yunhe, 277 Deaths, 33 injured, 4 missing, 1047 displaced  Tailings dam overflowed in heavy rainfall, substantial environmental damage with massive fish kill  Dam operators fully opened the dam’s floodgates without audible warning, 24 engineering students and tour guide swept to their deaths  Iron ore tailings dam collapsed, send torrent of water downstream, illegal mine, dam built in violation of regulations and few safety inspections, torrential rains, downstream village, office building and outdoor market inundated, 265 deaths  Dam wall collapsed, poor drainage and design, liquefaction, problems in risk management, 19 deaths, destroyed one town and obliterated a second | Convoluted judicial process, 11 charged, including the general manager of hydraulic construction, officials of the Office of Public Works, and 2 university lecturers who were project consultants. 2 died before trial, 8 charged with multiple homicides, one engineer committed suicide before trial, prosecutor recommended 24 years imprisonment, trials and judicial proceedings from November 1968 through March 1971, 5 of the 8, including the 2 professors, ultimately acquitted of all charges. The final sentence for the general manager was 2 years in prison and 8 months for the general inspector of public works for the local body.  34 years for judges to close case  10 convicted in 1992 of multiple manslaughters and culpable catastrophes  The owner, operator, and 6 employees guilty of negligence, no jail time, homicide charges dropped against the former plant manager, metallurgical engineer, and acting plant superintendent, Harmony Gold Company fined R150,000, Fraser Alexander, the engineering company, fined R150,000  Owner indicted on 7 counts of manslaughter and reckless endangerment; pled guilty to 1 count of reckless endangerment in 2013, sentenced to 7 months, released after 1 ½ months for medical reasons, corporation pled guilty to 7 manslaughter charges  58 individuals, including 34 government officials, sentenced in December 2010, Shanxi Governor resigned, 13 mining company officials arrested, deputy police head and former vice mayor among those who accepted bribes, mine owner received death sentence with 2 year reprieve  Company pled guilty to violating the National Environmental Management Act and the National Water Act, fined R1,450 million with additional suspended fine of R1 million  Owner indicted on 7 counts of manslaughter and reckless endangerment; pled guilty to one count of reckless endangerment in 2013, sentenced to 7 months, released after 1½ months for medical reasons; corporation pled guilty to 7 manslaughter charges.  6 dam officials and 3 university professors charged with culpable homicide not amounting to murder, the professors for letting the students enter the river downstream of the dam  Mine owner and foreman arrested  Police in February charge chief executive of mining company, 5 other company officers, and a contractor with qualified homicide (involuntary manslaughter), Police in March charged 14 individuals with environmental crimes for not only causing the flood, but failure to properly clean it up |
| 1. ***Subway Tunnels*** | | | |
| 7/1/2003  4/20/2004  3/19/2006  3/29/2007  11/15/2009 | Shanghai subway, China  Nichol Highway Tunnel, Singapore  Moscow subway, Russia  Subway tunnel collapse, Beijing, China  Hangzhou, China | Subway tunnel collapsed, flaws in design, improper management and inadequate emergency planning response measures, collapsed caused neighboring buildings and land to sink  Subway tunnel collapsed during construction, causing nearby highway to collapse, 4 deaths, 3 injuries, bad design and construction plus misinterpretation of building code  Subway tunnel collapsed on a moving train, unauthorized construction of billboard above  ground over subway  Loose fill on site, poor management, subway caved in, 6 deaths, 2 missing  Subway tunnel collapsed, 21 construction workers killed, 24 injured. | Arrests include assistant project manager of construction company, project manager of tunneling company, and chief supervisor of consulting supervising company, three other company employees on bail, other employees fired and administrative penalties  Construction company pled guilty on one count, fined equivalent of $121,400 in U.S. dollars, 3 execs, the design manager, project coordinator, and project director awaiting legal proceedings  Construction firm officer detained  10 detained, including site supervisor and tunnel designers  10 officials and company employees charged, while 11 received administrative remedies.  The defendants include the general manager  and chief operating officer of the project,  2 officers of the contract monitoring company, 2  officers of the contractor, an officer with the project administrator, and 2 officers with the Hangzhou quality supervision station. |

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| **V. MINING** | | | |
| 12/27/1975  11/14/1996  2/23/2004  11/24/2004  11/ 28/ 2004  7/2/2005  7/11/2005  8/7/2005  11/27/2005  12/8/2005 | Chasnala Coal Mine, Dhanbad, India  Gretley Coal Mine flooded, New South Wales, Australia  Baixing coal mine explosion, Jixi City, Heilongjiang Province, China  Chenjiashen coal mine gas explosion, Shanxi Province, China  Westway Mine, Plymouth, Nova Scotia, Canada  Jiajiapu Coal Mine explosion, Shanxi Province, China  Shenlong Coal Mine explosion, Fukang County, China  Daxing Coal Mine flooded, Xingning City, Guangdong Province, China  Dongfeng Coal Mine explosion, Qitaihe City, Heliongjiang Province, China  Liuguantun Coal Mine explosion, Tangshan City, Hebei Province, China | Gas explosion, followed by flooding of the mine, 372 official fatalities  Mining machine cut into adjoining disused mine shaft filled with water, 4 deaths  Defied order to halt production, 24 deaths  Gas explosion, miners ordered to go back in after fire one week earlier, inadequate safety measures, 166 deaths  Explosion and fire at recently opened mine; numerous safety violations, 26 deaths.  Managers covered up fatality count by shipping bodies to another tow, reported 19 fatalities actually 36  Gas explosion killed 83 miners  No operating license or safety permits, catastrophic flooding, operating in violation of a shut down order, numerous safety violations, 123 miners perished  Ignition of coal dust, nine producing in excess of ventilation capacity, 171 miners died, 48 injured  Poor safety record, lacked production or safety license, gas explosion, 91 deaths | Verdicts delivered on March 15, 2002, 37 years later, agent and manager received 1 year rigorous and imprisonment, then agent and manager received 1 year and fines of 5,000Rs, 2 defendants passed away before the trial  Operating company and parent fined $730,000 Australian for violations of the New South Wales Occupational Health and safety Act, First mine manager fined $30,000, second mine manager $42,000, and mine surveyor $30,000  Mine operator arrested  Mine owner sentenced to 5 years, 6 months, former deputy director and chief engineer received 5 years, officials punished  Mine owner and 2 managers charged with 26 counts of criminal negligence and manslaughter; company went bankrupt in 1993 and charges dropped against the individuals in 1998. Canada subsequently amended its criminal law to impose criminal liability on managers and directors for failure to provide worker safety (The “Westway Bill”).  Legal officer and mine contractor detained  Former board chairman sentenced to 6 years, 4 managers and technicians 3-5 years, Deputy Mayor of Fukang County in charge of work safety arrested  Board chairman, chief technician and nine others caught attempting to flee, 17 arrested, one for destroying records, 22 officials punished, 41 more to be investigated. Most owners of the mine were local Communist Party officials  Mine owner sentenced to 6 years for negligence, company’s Communist Party secretary charged with dereliction of duty, 4 others punished  Seven arrests, Director, Deputy Director, workplace safety inspector and investors arrested |
| 1/26/2006  5/19/2006  10/23/2006  3/28/2007  5/5/2007  12/6/2007  6/13/2008  7/14/2008  9/20/2008  2/22/2009  ```  4/4/2009  5/18/2009  9/8/2009  11/21/2009  3/15/2010  3/28/2010 | Melville, West Virginia, United States  Xinjing Coal Mine, Yuxiun County, Shanxi Province,  China  Pottsville, Pennsylvania  Coal Mine Explosion, United States  Yujialing Coal Mine explosion, Linfen City, Shanxi Province, China  Pudeng Coal Mine explosion, Linfen City,  Shanxi Province, China  Xinyao Coal Mine explosion, Shanxi Province, China  Anxin Coal Mining Company explosion, Xiayao City, Shanxi Province, China  Lijiawa Mine explosion, Yuxian County, Hebei Province, china  Fuhua Coal Mine fire, Hegang City, Hellongjang Province, China  Tunlan Coal Mine explosion, Gujiao City, Shanxi Province, China  Jinli Coal Mine flooding, Xingnong Township, Jixi City, Heilongjiang Province, China  Xinging Coal Mine fire, Heilongjing Province, China  Xinhua Fourth Mine explosion, Pingdingshan, Henan Province, China  Harmony Gold mine fire, South Africa  Dongxing Coal mine fire, Xinmi City, Zhengzhou, Henan Province, China  Wangjialing Coal Mine flood, Shanxi Province, China | Aracoma Alma Mine #1 fire, 2 miners died from carbon monoxide exposure.  Illegal mine, mine tunnels flooded, operating at ten times licensed output level, 57 fatalities, problem was the coverup of the accident, including derailing investigations, village mayor and communist party secretary accepted bribes, mine officers destroyed evidence, local officials hid the tragedy for 85 days  Unqualified miners handling explosives, safety violations, 1 death, I injured  Gas explosion, expired license, unsafe working conditions, 26 deaths  Poor ventilations illegally stored explosives overheated and spontaneously exploded, explosives, section of mine operated illegally, false map to cheat inspectors, 125 working in area restricted to 444 miners per shift, 28 deaths, 23 injured  Illegally stored homemade explosives ignited on own and triggered blast, 35 dead, 12 injured, 1 missing  Mining unauthorized seam, 129 miners on duty, but only 60 authorized, 105 deaths, 18 injured  Mine explosion, 35 deaths including 1 rescue worker, Problem is the 85 day coverup of the disaster, mine bosses removed and cremated bodies, destroyed evidence, sealed the shaft and paid reporters to stay quiet  Bad management, spontaneous combustion of coal,31 deaths  Gas explosion, carbon monoxide fumes, poor ventilation and gas management, 74 deaths, 114 hospitalized  Illegal operation, did not follow draining rules, flooded from an abandoned mine, 12 deaths  Trapped pressurized gas underground, poor ventilation, poor management, 108 deaths  Undergoing maintenance and repair, not approved to reopen, 56 deaths  Illegal mine, 82 miners died from inhalation of toxic gasses  Unlicensed mine, no oxygen tanks in mine, 25 deaths Electrical fire in mine being rebuilt, mining not allowed during construction, 25 deaths  Expanding production, miners broke wall into abandoned shaft, mine flood, repeated warnings ignored of water leaks, 38 deaths | 4 mine foremen pled guilty to failure to conduct escapeway drills, Massey Energy Company and its subsidiary agreed to pay $4.2 million in criminal fines and civil penalties.  Nine plant managers arrested, mayor and Communist Party secretary suspended for corruption, 2 journalists and 26 people posing as journalists accused of receiving bribes  Owner and son pled guilty to involuntary manslaughter, reckless endangerment and 3 counts of the Anthracite Coal Mining Act, son sentenced to 3-23 months in prison, owner 6 months of house arrest  Mine owner, senior manager, and others arrested, 7 Communist Party officials removed from posts  28 transferred to judicial authorities, major liability accident, illegally purchasing and selling explosives, dereliction of duty  14 for illegal mining, liability accident  2 illegal purchasing and selling explosives  3 tax dodging  9 dereliction of duty, abuse of power and accepting bribes  general manager and vice general manager of coal mine sentenced to life, chairman received life  Mine owner and legal representative sentenced to life imprisonment, vice mayor received 14 years, 78 people bore some responsibility, 39 referred to judicial authorities  26, including head of mine and legal representative, referred to criminal prosecution, 24 received administrative sanctions  25 local officials detained, county chief, work safety officers, police officer arrested, mine owner and 10 journalists arrested, deputy director of the city’s publicity department accused of bribing reporters  9 faced criminal charges, 13, including Vice Mayor of Hegang City, received disciplinary penalties  Three mine officials fired, mine manager, chief safety officer, and engineer  Owner arrested  Director, vice director, chief engineer removed from posts  CEO, security manager, production manager and other coal company employees arrested for “negligently causing a serious accident,” several local officials dismissed  8 officials arrested, sacked, or suspended, 110 implicated employees arrested  Five arrests, company investor, legal representative, 3 senior mine officials, 4 government officials removed from posts, vice mayor, deputy director of Xinmi Coal Mine Bureau, 3 safety officials also dismissed  Head of construction team sentenced to 4 years, 8 others received 3 year terms on June 14, 2012 |
| 4/5/2010  6/26/2010  7/18/2010 | Montcoal, West Virginia, United States  Dunkwa-on-Offin gold mine collapse  Xiaonangou Coal Mine fire, Hancheng City, China | Mine explosion killed 29 miners, numerous safety violations.  Illegally operation of an abandoned mine, heavy rains caused collapse of mine, estimated 100 deaths out of 136 illegally hired miners  Electric cable caught fire in mine expansion, 28 deaths | Massey Energy Co. CEO indicted on 4 counts; former mine superintendent pled guilty for conspiring to obstruct government investigation – sentenced to 42 months in prison and 3 years supervised release. Successor company paid $209 million in criminal penalties. CEO convicted of a misdemeanor conspiracy to violate safety laws.  Owner arrested  Owner detained |
| 11/19/2010– 11/26/2010 | Pike River Mine, New Zealand | Series of mine explosions, 29 miners and contractors died, numerous safety violations | New Zealand brought 25 criminal charges against 3 parties for health and safety violations. Mine company entered bankruptcy, contracting company pled guilty to 3 counts of Health and Safety violations – accessed a fine of $46,500.  Charges dropped against the mine boss. |
| 8/29/2011  9/27/2011  11/10/2011  3/31/2012–4/1/2012  8/29/2012  12/5/2012  4/21/2014 | Zengjiagou Coal Mine flood, Dazhou, Sichuan Province, China  Sizhuang Coal Mine gas leak, Yunnan Province, China  Kellingley Collier Mine, North Yorkshire, United Kingdom  Babao Coal Mine, Jilan, China  Xiaojiawan coal mine explosion, Sichaun  Province, China  Yunnan mine explosion, Fuyuan County, China  Hongtutian Coal Mine, Fuyuan County, Qujing City, Yunnan Province, China | 10 deaths, 2 missing  Mine operating illegally after license revoked, deputy head of the coal mine faked being in the mine at the time of the accident by smearing coal on his face, 34 deaths  Deep pit mine roof collapsed on miner, mine managers aware of previous roof fall, but did not nothing, 1 death, also 200 miners evacuated on a different occasion for an explosion, no deaths  Series of explosions in the mine; 53 miners died, 23 injured.  Series of mine explosions, 53 miners died, 23 injured  43 deaths, 3 missing  Planned detonation ignited gas, mine manager ordered open a sealed mine shaft, used explosives to give way for a new shaft, had been off limits due to gas buildup, 17 deaths, 6 injuries  Gas explosion, 14 deaths | Mine owner and safety official taken into custody  Deputy head of coal mine arrested for faking evidence, smeared coal on his face and pretended he escaped from the mine  Company pled guilty to violating Health & Safety Act, fined 200,000, this last deep pit mine in England closed in 2015  Mine manager received 5 year sentence, board chairman, general manager, and nine others received sentences ranging from 10 months to 4 years, 5 safety workers received suspended sentences.  19 sent to legal action  2 arrests of mine officials, 8 county officials suspended, including county’s coal industry bureau chief and bureau’s deputy director  Nine arrests, investors and managers |
| 5/13/2014  8/14/2014  10/28/2014  11/28/2014  3/4/ 2015  12/25/2015  4/2/2016  9/27/2016  10/31/2016  11/17/2016  11/29/2016  11/29/2016  12/3/2016  12/4/2016  12/5/2016  2/16/2017 | Soma Coal Mine explosion, Turkey  Anzhishun Coal Mine flood, Heilongjiang Province, China  Ermenek coal mine flood, Turkey  Chenjiashan Coal Mine fire, Shanxi Province, China  Zasyadko Coal Mine explosion, Donetsk breakaway province of Ukraine  Yumong gypsum mine collapse, Baotai Town, Pingyi County, Shandong Province  Sheraz Coal Mine explosion, Pakistan  Linli coal mine explosion, Ningxia Autonomous Province, China  Jinshangou mine explosion, Chonquin Province, China  Siirt copper mine flood, Turkey  Mine explosion, Qitaihe City, Heilongjiang Province, China  Baoma Mining Co. Chifeng, Inner Mongolia Autonomous Region, China  Zubal Coal Mine explosion, Lianyuan, Hunan Province, China  Baoma Coal Mine explosion, Yuanbaoshan District, Chifeng District  Xinjia Coal Mine, Badong County, Hebei County, China  Zubao Coal Mine explosion, Lianyuan, Hunan Province, China | Coal mine explosion, 301 miners died  Mine flooded  Water pipe exploded, causing flooding of the mine, failed to drain from a shaft, warning signs ignored, 18 miners drowned, lack of safety drills, inadequate distance between old and new mine, improper construction, drainage pipe improperly installed, neglected safety standards  Gas explosion, insufficient safety measures, miners had been ordered back into the mine after fire a week earlier, fire not totally out, 165 deaths, only 127 miners rescued  Gas build up caused explosion, 34 miners died  Poor risk awareness and safety control, collapse caused by abandoned neighboring gypsum mine, collapse registered a 4 on an earthquake monitor 1 death, 13 missing  Explosion, 5 deaths, 8 injuries  Illegal mining activity, 19 deaths, 1 missing  Illegal mining in geologically unsafe area, improper ventilation, explosion, 35 deaths  Heavy rains caused collapse of Madenkoy copper mine, 16 miners died  Illegal coal mine, gas explosion, 32 deaths  Coal mine explosion, 17 deaths  Coal and gas outburst, ignored concerns of local safety bureau over safety procedures, unsafe working conditions, 11 deaths  Warned against excessive extraction techniques, 32 deaths  28 deaths  Manager underreported death toll, 10 deaths | 45 prosecutions for 8 executives, including the chief executive, general manager, and the mine’s operations manager, first degree homicide charges against the former board chairman and seven other senior officers. Involuntary manslaughter charges against 29 others, including mine managers, engineers, and security supervisors.  Government forbad investigation and prosecution of government officials.  Owner and senior manager in charge of construction detained for covering up the accident  Eight arrests, including 5 engineers, owner and two senior officials at the mine, involuntarily causing death by negligence  Mine safety legislation enacted  Former director of mine sentenced to 5 years, 6 months, former deputy director and chief engineer received 5 years  General director of mine arrested  Mine owner committed suicide, 3 persons in charge of mine arrested, 2 officials from local land and resources bureau guilty of dereliction of duty, 14 local officials punished by the Communist Party  Owner, contractor and mine manager arrested  Manager and other responsible under police detention  Safety officials suspended  Eight arrests, 2 permanent supervisors, 2 occupational safety specialists, chief engineer, site manager, operating manager,    4 arrests, owner and 3 managers  Coal mine manager arrested for underreporting death toll, 3 government officials (2 deputy mayors) under investigation  Seven sentenced in January 2018 to 18-24 months  Chairman and nine others arrested for illegal mining and negligence  Mayor and Deputy Mayor disciplines, Deputy Director of City Finance Office and deputy head of county government sacked  Coal mine manager detained, 3 officials, including 2 deputy mayors and local production safety chief, under investigation |

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| **VI. OIL SPILLS** | | | |
| 3/29/1989  2/15/1996 | Tanker grounded, Pembrokeshire, Wales United Kingdom  Exxon Valdez Tanker grounded, Valdez, Alaska, United States | Sea Empress tanker ran aground in mid-channel at St. Ann’s Head, Pembrokeshire, Wales, 72,000 tons of oil discharged, located in Pembrokeshire Coast National Park (and marine nature preserve), substantial environmental damage, 200 km of coastline affected, 5 years to clean the coastline  Tanker ran aground on Bligh Reef, discharging 11 million gallons of oil into Prince William Sound, substantial short term and long term environmental damage. | Milford Haven Port Authority (MHPA) pled guilty in January 1999 for causing pollution under the water resources Act of 1995. MHPA fined £4 million and assessed £825,000 in prosecution costs  Exxon and its shipping subsidiary charged with 2 felony and 3 misdemeanor counts – pled guilty to 1 misdemeanor, paying $1 billion in fines and restitution.  State charged Exxon Valdez captain with one felony and three misdemeanor charges. Jury acquitted him of the felony and two misdemeanors, but convicted him of the remaining misdemeanor. After 6 years of appellate litigation he paid a $50,000 fine and performed community service. |
| 11/13-19/2002  1/19/2005 | M.V. Prestige oil tanker spill, off Spain  Petroleum barge exploded, Chicago Ship & Sanitary Canal, Illinois, United States | Old, single hull oil tanker had a burst oil tank on 11/13, ordered by Spain, France, and Portugal to stay away, tanker split in half with an estimated 20 million gallons of oil released, causing substantial environmental damage.  Crew member used propane torch to heat cargo pump, explosion, thousands of gallons of oil discharged into canal, Cleanup and response costs exceeded $12 million, crew member died | A Spanish court in November 2013 acquitted the captain, chief engineer, and the former head of Italy’s merchant marine of crimes against the environment. A fourth defendant, the second officer was “on the run.” The court convicted the 78 year captain of disobedience (failure to keep the ship away from Spain, and sentenced him to 9 months. Spain’s Supreme Court in January 2016 reversed the acquittal of the captain, finding him guilty of gross negligence, sentencing him to 2 years. In addition, it held the captain, owner, and British insurance company liable for the damages.  Captain Dennis Egan and Egan Marine Corp. found guilty of negligent manslaughter of a seaman and the Clean Water Act, captain sentenced to 6 months in prison and a year of supervised release, Egan Marine was sentenced to three years supervised release and ordered to pay restitution of $5.3 million |
| 11/7 /2007  12/8/2007  4/20/2010–7/15/2010  10/5/2011 | M/V Costa Buscan crashed into San Francisco Bay Bridge, oil spill  Oil spill, Daesan Port, South Korea  BP Gulf Blowout,  United States  MV Rena grounding, New Zealand | 53,000 gallons of oil spilled into Bay, 2,000 migratory birds killed, including brown pelicans, marbled murrelets and western grebes,  Hebei Spirit supertanker at anchor, carrying 260,000 tons of crude oil, cable connecting barge to tug snapped in heavy seas in storm, barge crashed into Hebei Spirit, estimated 19,000 tons of crude oil fouled hundreds of miles of South Korea beaches  BP offshore drilling on rig owned by Transocean. The sealing of the drill pipe was by Halliburton. The cement seal did not hold, resulting in an explosion and fire. 11 workers disappeared and presumably died. The rig sank a few days later. A judge held 3.15 million barrels of oil escaped. Extensive environmental damage.  MV Rena struck reef off New Zealand, broke in 2 in bad weather, poor navigational skills of captain and second officer, over 350 tons of oil escaped, total cost of grounding to New Zealand, $47 million | Pilot pled guilty to Clean Water Act (CWA)violation and violation of the Migratory Bird Act, 10 months in prison and loss of pilot’s license, ship owner pled guilty to CWA and lying to government investigators, $10 million fine and implemented compliance program for its fleet  Tug captains, barge captain, captain and first officer of supertanker charged with negligence and violating maritime law, 2 tug captains sentenced to 3 years, convictions of tanker officers reversed, barge captain acquitted  Multiple criminal prosecutions. BP charged with 11 counts of manslaughter, 2 misdemeanors, and a felony count of lying to Congress. BP pled guilty and agreed to $4.525 billion in fines and other payments.  Transocean pled guilty to violation of the Clean Water Act and accessed $1.4 billion in criminal and civil fines.  Halliburton pled guilty to one count of destruction of evidence - paid a $200,000 fine and received 3 years probation, also contributed $55 million to the Fish & Wildlife Foundation.  Four BP employees charged. Former VP David Rainey acquitted of manipulating data after judge dismissed an obstruction of Congress charge.  Two rig supervisors charged with 11 counts of manslaughter and seamens manslaughter and one count of the Clean Water Act (CWA). A judge dismissed the 22 manslaughter counts. One rig supervisor pled guilty to the CWA count and received 10 months probation. A jury acquitted the second rig supervisor.  Kurt Mix, a BP engineer, was charged with 2 felony counts of obstructing justice by deleting 2 email chains. A jury convicted him of one count and acquitted him of the other. The conviction was set aside for juror misconduct. He pled guilty to a misdemeanor prior to retrial at the request of the Justice Department, receiving no jail time or fine.  A final criminal case was brought against the Halliburton Cement Technology Director for destroying evidence. He pled guilty to a misdemeanor, receiving a $1,000 fine and 100 hours of community service, but no jail time.  Captain and second officer pled guilty to violation of the New Zealand resource management Act, sentenced to 7 months, company pled guilty and fined $300,000 |

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| **VII. TRANSPORTATION** | | | |
| 1. ***Aviation*** | | | |
| 2/20/1956  7/30/1971  11/20/1974  9/10/1976  12/18/1977  10/8/1979  2/9/1982  1/16/1983  3/11/1983  8/12/1985  7/30/1987  10/15/1987  6/26/1988  7/27/1989  1/20/1992  6/9/1995  5/11/1996  12/17/1997  8/31/1999 | Air France DC-6  Midair collision, Japan  Lufthansa 747 crashed on takeoff, Nairobi, Kenya  Midair collision, Zagreb, Yugoslavia  Crash landing, Madeira, Portugal  Swiss Air DC-8 runs off runway, Athens, Greece  JAL DC-8 crashed on approach to Tokyo Haneda Airport, Japan  Turkish Airlines crash, Ankara, Turkey  Avensa DC-9 hard landing, Caracas, Venezuela  JAL B-747 crashed into mountain, Japan  Belize Air International cargo plane, Mexico City, Mexico  Aero Trasporti Italiani Flight 400 crashed on Mount Crezzo, Italy  Plane crash, Mulhouse, France  KAL 803 crash, Tripoli, Libya  Air Inter A320 crash, Strasbourg, France  Crash landing by Palmerston Airport, New Zealand  ValueJet crash, Everglades, Florida, United States  Aerosvit Flight 241 crashed into mountainside on missed approach, Thessaloniki Airport, Greece  LAPA crash, Buenos Aires, Argentina | Plane crashed during visual landing, pilot error,  49 passengers and 3 crew died  Passenger plane collided with military jet, flown by trainee pilot who was not watching for air traffic, all 162 on passenger plane died  Flight engineer did not deploy the leading edge slats, 59 deaths, 55 injuries  Midair collision, 176 deaths  Plane crashed on approach to Madeira Airport, failure to maintain proper altitude, 36 deaths  Rainy conditions at night with pilot error, plane overran runway, 14 deaths, 19 injuries  Psychologically impaired pilot reversed two engines, plane crashed 300m short of runway, 24 passengers died  Crash landing 160’ short of runway during thick fog and driving snow storm, 20 survivors, including all crew members, out of 67 on plane  Hard landing in thick fog, plane slid off runway, 22 passengers an 1 crew member died, I passenger seriously injured  Explosive decompression 12 minutes into flight, negligent repairs by Boeing 7 years earlier, all 15 crew members and 505 of 509 passengers perished  Old B-377 cargo plane carrying horses and racers crashed minutes after takeoff onto crowded highway, plane overloaded, panicked horses shifted weight distribution, over 50 deaths and dozens injuries on the ground. None of the 18 horses survived  Nosedived 15 minutes after takeoff, 34 passengers and 4 crew died  Air France Airbus crashed on maiden flight during flyover at an airshow, 3 deaths, 50 injuries  Plane crashed 1.5 miles from airport in heavy fog with limited visibility, crew error, 75 passengers and 1 crew member died,  Plane crashed while circling airport, nighttime, low cloud, light snow, no terrain avoidance equipment on airplane, 9 survivors of 96 on plane  Ansett flight crashed into hilly terrain during approach in bad weather, lower approach than appropriate, ground proximity warning system malfunctioned, 3 passengers and a flight attendant died  Plane crashed 10 minutes after takeoff, oxygen containers caused fire in cargo hold, 110 deaths, mechanics had not followed proper safety precautions.  Pilot error, loss of situational awareness, crew had never flown into this airport before, ignored cockpit warnings, bad weather, airport lacked radar, communications issues with ATC, all 70 on board died  B 737 crashed during takeoff, flaps fully retracted and not extended, crew ignored warning alarms, 65 fatalities (60 passengers, captain and copilot, another crew member, and 2 on ground), 40 injured, captain had expired license, company had internal control issues | Captain/pilot convicted of involuntary manslaughter  Trainee pilot acquitted of involuntary manslaughter  Flight engineer acquitted of manslaughter, Boeing changed the warning systems  5 air traffic controllers charged with murder and imprisoned  Check pilot sentenced to 2 years for criminal negligence, captain to 1½ years (not served), statute of limitations. Trials were seven years after the accident.  Pilot and co-pilot convicted of manslaughter with negligence and other charges, 5 and 2½ years sentences respectively, sentences reduced on appeal, and then the defendants could substitute a fine ($5,000) for prison time  Charges dropped against pilot, but criminal investigations against the doctors who examined him before the flight and his supervisory pilots  Pilot and copilot convicted  2 pilots sentenced to 8 years, pardoned by President    20 charged, including 4 Boeing employees, but no prosecutions (Boeing refused to cooperate) JAL President resigned, JAL maintenance manager and an engineer who inspected the plane and cleared it as safe committed suicide  Crew detained, no prosecutions  Pilot and co-pilot convicted of murder, co-pilot’s conviction overturned, aircraft designers convicted of homicide  Captain, first officer, 2 Air France officials, and president of flying club were found guilty of involuntary manslaughter, pilot sentenced to 6 months in prison and 10 months probation  Pilot and co-pilot guilty of negligence. Pilot received 2 years and co-pilot 1½ (suspended)  6 defendants from air traffic control, airline and aviation safety agency acquitted of manslaughter  Pilot charged with four counts of manslaughter and three counts of unlawfully injuring passengers. Pilot acquitted after 26 day trial six years after accident  4 count indictment against maintenance company, the director of maintenance and 2 mechanics. Company convicted of one count, maintenance director and one mechanic acquitted. Second mechanic was a fugitive from justice.  Air traffic controllers convicted of manslaughter, sentenced to 5 years  32 initially ordered arrested with 34 indicted, numerous judicial twists and turns, 4 airline officials charged with criminal negligence leading to death and 3 air force officers with dereliction of duty, 9 ultimately ordered tried in 2005. Trial acquitted 6 after a 2 year trial (Lapa President, 3 executives and 2 Air Force officers), former directors of operations and the 737 line officer received 3 year suspended sentences |
| 7/25/2000  9/26/2000  10/30/2000  10/8/2001  11/24/2001  4/15/2002  6/11/2002  7/1/2002  8/6/2005  8/14/2005  9/29/2006  1/25/2007  3/7/2007  11/30/2007  8/20/2008  8/3/2010  9/7/2011  7/23/2014  10/20/2014  11/28/2016 | Concorde SST Plane Crash, Paris, France  Midair collision between 2 helicopters, Buson, Switzerland  Singapore Airlines 747 crashed during takeoff, Taoyuan Airport, Taiwan  Tarmac collision, Milan airport, Italy  Crash landing, Zurich, Switzerland  Air China 767 crash, Pusan, South Korea  Aircraft damaged during takeoff, Winnipeg, Canada  Midair collision over Uberlingen, Germany  Tuninter Flight 1153 ditched in Mediterranean Sea, off Palermo, Italy  Helios Flight 522 crash, Greece  Midair collision over, Amazon, Brazil  Fokker 100 jet regional jet overshot runway, France,  Garuda plane crash, Adisucipto International Airport, Indonesia  MD-83 crashed, Isparta Airport, Turkey  Spanair Flight 5022 crashed on takeoff, Madrid, spain  Plane crash, Turkey  Yak-42 crash, Yarolasvl, Russia  TransAsia plane crash, Taiwan  Private jet crash, Moscow, Russia  LaMia #2933 crashed near Medellin, Colum | Concorde on takeoff hit debris on the runway, a titanium piece allegedly from a Continental Airlines plane punctured a tire, sending fragments Into the fuel tank, igniting a fiery inferno.  2 Air Glaciers helicopters collided, one pilot and 7 tourists died, poor training  Attempted to take off from wrong runway during a typhoon, crashed into construction equipment on runway, 83 deaths, 71 injuries  SAS MD-87 collided with Cessna business jet on runway in morning fog, all 110 on the MD-86, 4 on the Cessna, and 4 on the ground died, inoperable ground radar, controllers often spoke in Italian instead of English, the international air traffic language, confusing the Cessna pilots  Crossair plane crashed into hills 2½ miles short of airport, poor visibility, pilot error, 24 deaths, including cockpit crew and flight attendant  Takeoff in strong winds and heavy rain, struck construction equipment on runway, 83 deaths, 39 serious injuries  Piper damaged in takeoff from private airport, I death, several injuries,  DHL cargo plane collided with Bashkirian passenger plane, all 71 passengers and crew on the 2 planes perished, Swiss air traffic controlled the flight, Private company, Skyguide, provided the air traffic control, the one traffic controller (other was resting in violation of rules) was overworked, operating two screens at one time, managerial incompetence and systems failures  Plane ran out of fuel, fuel quantity indicator installed the night before flight, incorrect fuel readings 15 of 35 passengers and 1 of 4 crew died  Plane crashed 25 miles from Athens, incorrect setting on pressurization, all 121 on board rendered unconscious, 115 passengers, 6 crew, no survivors  Embraer legacy 600 private jet collided with GOL Airlines 737, all 154 on GOL plane perished, American pilot and co-pilot of private plane survived, transponder not turned on, problems with Brazil ATC, unsuccessfully tried to contact 15 times  Wing icing, pilot lost control on aborted takeoff, killed driver of a truck, 1 death  Crash landing, mechanical reasons ruled out, cause was excessive speed and steep descent, 22 passengers and 1 crew member died  Atlas Jet plane owned by World Focus crashed on approach to Isparta Airport, maintenance problems with plane, all 50 passengers and 7 crew members perished, 6 passengers were scientists headed to a conference, crash blamed on pilot error (special disorientation  Failure to deploy flats and slats for takeoff, warning system did not sound, 18 survivors, 154 deaths, including all crew members  Katekavia flight on approach to Igarka Airport, poor visibility at night, crashed into trees 477 meters short of runway. All 11 passengers and 1 of 3 crew members killed,  Plane with ice hockey team crashed on takeoff, pilot error, 4pilots unqualified, flight approved pursuant to falsified documents4 deaths, flight engineer the only survivor  Pilot unsuccessfully attempted to land during typhoon, inadequate visibility, all 4 flight crew and 44 out of 54 passengers died, company tolerated non-compliance with standard operating procedures  Private jet crashed on takeoff, plane hit snowplow, CEO of Total Oil Company and 3 others died  Plane ran out of fuel, 71 of 77 on board died, including 23 coaching staff and 19 of 22 players of the Brazilian Chapecoense Soccer Team, poor flight planning, fuel shortage, failure to declare an emergency, and poor decisions by air traffic controllers at Medellin | France indicted Continental Airlines, the mechanic who replaced the titanium strip, the manager’s supervisor, the head of the Concorde Program at Aerospatiale, Concorde’s chief engineer, and the head of France’s airline regulator. The allegation was that the officials knew the fuel tanks were vulnerable. Continental and the mechanic were convicted of involuntary manslaughter in December 2010, and acquitted the other defendants. An appellate court reversed the convictions on November 29, 2012.  Company owner acquitted, 2 surviving pilots guilty of negligent homicide, received suspended sentences, blame was cast on the deceased pilot  Charges of manslaughter against the pilots dropped by prosecutor in 2002  11 defendants in 2 trials, airport air traffic controller(ENAV), former director of ENAV, and former managing director of airport (ENAC), and former manager for 2 airports sentenced at first trial to 6 to 8½ years, former director of ENAC received 8 years, former CEO of Italy’s ENAV and the former director who overseas Milan’s 2 airports received 6½ year,  At second trial the general manager of ENAC received a 4 year, 4 month sentence, manager of flight assistance center and local supervisor received 3 years and ten months, general safety supervisor of the airport and ENAV official were sentenced to three years and four months, 2 officials from the airport management company were acquitted, reversed on appeal. The Italy Supreme Court reinstated their acquittal on appeal, but overturned the acquittal of the former director of the airport and the manager overseeing the two airports  CEO, chairman and 4 managers acquitted of negligence  Pilot held under “house arrest” from April to December, ultimately released without charges  Appellate court overturned pilot’s convictions for criminal negligence, but upheld conviction for dangerous operation of airplane  Switzerland prosecuted 8 Skyguide employees for manslaughter, 4 acquitted, 3 air traffic controllers receive suspended sentences and the 8th is fined  Safety protocols changed after accident  Italian court sentenced cptain to 10 years for manslaughter, co-pilot, chief operating officer and 4 others received 8-10 years,  Criminal case in Cyprus, Helios CEO, managing director, operations manager, chief pilot, and company charged with 119 counts of manslaughter and causing death by recklessness/negligence, initial acquittal in December 2011, reversed in December 2012, convicted of manslaughter, sentenced to 10 years imprisonment, conviction upheld, but allowed to buy out sentences for €75,000 each  Legacy pilots detained for 70 days in Brazil, charged with negligence, U.S. judge sentenced then to 4 years and 4 months incarceration, but commuted the sentences to community service  Pilot charged with homicide and unintentional injuries, pilot received a six month suspended sentence and €20,000 fine  Pilot charged with 6 counts of manslaughter, convicted of negligence, sentenced to 2 years, overturned on appeal  Final judicial decision in January 2015, World Focus owner guilty of first degree homicide, World Focus CEO and technical chief guilty of second degree, collectively sentenced to 11 years, 8 months each for negligent homicide, World Focus maintenance chief received 5 years and ten months for negligent homicide, 2 pilots sentenced to 2 ½ years for false testimony, General manager of civil aviation and deputy general manager received sentences of 2½ years, 12 acquittals  Two maintenance engineers and supervisors charged with manslaughter  Pilot sentenced to 4½ years  Deputy head of airline guilty of violating regulations, sentenced to 5 years hard labor, released in an amnesty  Taiwan arrested 2 air traffic controllers in 2016 for criminal negligence in letting the plane land    Rookie air traffic trainee charged with multiple counts of causing death by negligence  General director of LaMia arrested for involuntary manslaughter, son detained for using approval to get an operational clearance, arrest warrant for employee who originally rejected the flight plan, but then changer her decision, warrant issued for a LaMia co-owner |
| 1. ***Maritime*** | | | |
| 6/15/1904 | General Slocum Steamship Fire, New York, United States | Chartered passenger vessel caught fire ½ hour after casting off from the dock. No fire drills for the crew; life preservers were both defective and weighed down with iron weights, causing users to sink to the bottom, life boats stuck to vessel, fire hoses were rotten, government inspector (United States Steamboat Inspection Service) certified vessel as safe 4 weeks before the tragedy. 1021 deaths, mostly women and children, only 321 survivors of 1338 passengers survived, 35 of 40 crew members survived. One of the victims was a police officer who perished while saving several lives. | Captain Van Schaick, 2 inspectors, 2 pilots, the president, secretary and commodore of the Knickerbocker Steamship company indicted. Captain convicted of one count of criminal negligence for failure to perform legally mandated fire drills, sentenced to 10 years hard labor, served 3½, company paid a small fine for falsifying inspections. Managers of life preserver company indicted, but not convicted.  State and federal government changed safety standards for passenger vessels. President fired chief inspector of USSIS. |
| 7/24/1915 | SS Eastland capsized, Chicago, Illinois, United States | Boat capsized at dock after 2,572 passengers boarded, 844 deaths. All but 4 crewmembers survived. | County quickly arrested captain, chief engineer and other crewmembers. Blame was placed on the chief engineer who died during the proceedings. Charges were dropped against all others, including the owners. |
| 3/6/1987 | Herald of Free Enterprise Ferry capsized, off Zeebrugger, Belgium, Prosecution in England | Ferry capsized 7 minutes after leaving port, bow doors left open because assistant boatswain was sleeping in cabin when he should have closed the doors. Water entering the bow caused capsizing. Ferry had no watertight compartments. | The captain, first officer, senior master, assistant boatswain, and 3 company directors charged with manslaughter |
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| 5/21/1996  12/8/1996 | MV Bukota ferry capsized, Lake Victoria, Tanzania  SS Heraklion ferry capsized, Greece | Ferry with capacity of 850 tons of cargo and 430 passengers capsized. Official death toll of 894. Only 53 survivors. Vessel declared unseaworthy a week before sinking. Insufficient life boats, life jackets, fire-fighting equipment, and failure to send distress signals.  Car ferry capsized in Aegean Sea in extreme weather, Refrigerator truck not secured in hull, life boats couldn’t lower, 217 deaths (57 crew and 161 passengers), 12 05 15 ships of the steamship company failed inspection | Captain and 8 officers of the Tanzania Railroad Corporation (ferry owner) charged with murder of 615 persons and gross negligence. They were arrested and then released.  Steamship line’s owner and general manager sentenced to jail in 1998 for manslaughter and faking documents |
| 11/24/1999  9/26/2000 | Dashun ferry sank, Yantai, China  Express Samina, Paros, Greece | Ferry caught fire and capsized in stormy weather, warnings of inclement weather ignored, inadequate safety measures, vehicles not properly secured, carrying 304 passengers and 81 vehicles, 283 deaths including captain  Ferry collided with reef, 82 deaths, First mate was watching a soccer match on TV when ferry hit the rocks. | General manager, deputy general manager, and 2 safety supervisors tried, Governor of Shandong Province and Minister of Communications punished administratively  Captain received 16 years for a variety of offenses, including causing a shipwreck through negligence and serial manslaughter through negligence. First mate sentenced to 19 years on the same charges. Second mate, first engineer, radio operator, and 2 representatives of the operating firm received sentences of 15 months to 8 years and 9 months. The helmsman and an inspector were exonerated. Company manager committed suicide. |
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| 10/15/2003 | Staten Island Ferry crashed, New York, New York, United States | Pilot was asleep at the wheel, causing ferry to crash into a concrete maintenance pier. The Director of Ferry Operations failed to enforce regulation of two pilots in the pilot house. 11 passengers died and dozens injured. Pilot was on painkillers at the time. Pilot’s doctor lied to investigators. | 11 counts of seaman’s manslaughter were brought against captain, assistant captain, pilot, and Director of Ferry Operations. Charges also brought against the doctor and the second pilot for making misrepresentations to the National Transportation Safety Board. Captain received a 3 year suspended sentence after pleading guilty to one charge of lying to the Coast Guard. He agreed to cooperate with prosecutors. Both pilots, the Assistant Captain and the Director also pled guilty. The sleeping pilot received a one year sentence. |
| 2/2/2006 | Egyptian ferry sank, Red Sea, Egypt | Fire started in vehicle parking area of 35 year old Al-Salam Boccaccio 98 ferry from Saudi Arabia to Egypt. Attempts to put out the fire with fire hoses caused flooding. 6 hour delay in notifying government. Official death was 1018; 426 rescued. | Captain sentenced to 6 months; ferry owner, son and 2 others acquitted in July 2008. Acquittals overturned on appeal. Owner was sentenced to seven years and 2 employees to 3 years each. |
| 3/2/2006  3/22/2006  2/22-25/2007  4/5/2007 | Vessel collision, Mobile Port, United States  Queen of the North ferry struck island, British Columbia, Canada  MV Levina I caught fire and sank  Sea Diamond struck reef and sank off Santorini, Greece, | Zim Mexico III cargo ship collided with Lee III, offshore supply vessel, Zim Mexico III struck crane, dock worker killed, Captain felt a tug was not necessary for a maneuver in near zero visibility  Ferry struck island during inclement weather at night. 2 passengers died. Karl Lilgert, navigation officer at helm missed a critical turn, may have been distracted by former girlfriend, the ship’s quarter master, on the bridge.  Ferry had caught fire February 22 on car deck, 51 deaths, sank under tow three days later five minutes after leaving port with four investigators and 12 journalists on board  Ship built for ferry service in 1986, converted to cruise ship in2006, ran aground on well-marked reef, Captain’s poor navigation skills,, recklessness, and negligence, 1,195 passengers, 2 passenger deaths | Zim Mexico III captain convicted and sentenced under the Seaman’s Manslaughter Statute to the 4 months time served. Company pled guilty, fined $375,000  Lilgert was indicted four years after the accident for death by criminal negligence, convicted on June 24, 2013, sentenced to 4 years. Canada Supreme Court dismissed appeal on May 14, 2015.  Captain and first officer arrested for negligence, local harbor master suspended  Captain sentenced to 12 years and 2 months, €8,000 fine, employee of company certifying the ship as seaworthy sentenced to 8 years, navigation officer received 2 years and 10 months, chief engineer 2 years and 4 months, company’s legal representative 2 years, , inspector/auditor 15 months and security officer 6 months and €600 fine, first engineer officer, chief officer, chief steward and cabin manager acquitted |
| 6/21/2008 | MV Princess of the Stars capsizes, Philippines | Ferry with over 800 on board capsizes in Typhoon Frank. Captain took ferry out despite typhoon warning. Philippines Coast Guard regulations forbid vessels sailing in vicinity of typhoons. | Arrest warrants issued for owners of ferry and the captain, who was later determined to have died in the sinking. Appellate court dismissed charges against the owners in 2013. Appeal pending before the Philippines Supreme Court. |
| 8/5/2009 | Princess Ashika Ferry sank, Tonga | Ferry described as a “rust bucket.” 74 deaths. | Charges of manslaughter against the captain, first mate, the managing director of the ferry company, the company, and the Acting Director of Marine and Ports. Captain received 6 months, the first mate 18 months, the managing director 5 years, and the official 3 years suspended sentence. Company was fined the equivalent of 500,000 Australian dollars. |
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| 7/10/2011  9/9/2011 | MV Bulgaria capsized and sank in Volga River, Russia  Spice Islander I capsized and sank, Zanzibar | Pleasure cruise ship sank in storm. Death toll of 122, including 72 women, 28 children, and 22 men. 79 survivors were 56 passengers and 23 crew members. The ship’s capacity was 140. 2 ships continued on course, not stopping to assist and rescue the victims. Numerous safety violations.  3,470 persons on ferry with capacity of 45 crew and 654 passengers, heavy rolling seas, strong winds, capsized after losing power, official death toll of 1,573 | 2 Transport safety officials charged with negligence: ship registrar who certified the vessel and a river transport inspector. The general director of the company that rented the boat was also arrested as well as the 2 captains who failed to assist. One captain was fined the equivalent of 4,900 Euros.  Russia proceeded to inspect other vessels, banning 23 from operating as passenger vessels and 66 administrative cases were brought against ship owners.  12 accused of manslaughter, judge acquitted the accused on June 30, 2014 |
| 1/13/2012 | Costa Concordia cruise ship ran aground, Italy | Cruise ship struck a rock, 32 passengers and crew members died. | Captain sentenced to 16 years, 10 for manslaughter, 5 years for shipwreck, and 1 for leaving the ship before the passengers, the first mate, the third mate, the helmsman, the ship’s hotel director, and the onshore emergency manager pled guilty to multiple manslaughters and the three officers also to causing a shipwreck. |
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| 2/2/2012  4/30/2012 | Rabaul Queen ferry sank, Papua/New Guinea  Assam ferry capsized  India | Overloaded, unseaworthy ferry capsized and sank when struck by 3 waves during heavy storm, unknown number of passengers, but scores known dead and missing, 256 survivors  Ferry capsized during a storm. Ferry overloaded with people and cargo while lacking life jackets and life boats, 103 bodies recovered, scores missing | Owner, captain, chief mate, state port control officer, national safety manager for the port charged with 172 counts of manslaughter, safety manager agreed to testify against other defendants, charges dropped in 2016 against the chief mate and reduced to 88 counts against the owner  Owner, pilot, ticket checker, and a helper arrested for plying the ferry on an expired license. |
| 7/18/2012  10/2/2012  1/5/2014  4/16/2014  6/18/2014  8/4/2014  12/28/2014 | MV Skagit capsized and sank, Tanzania/Zanzibar  Ferry collision, Hong Kong  MV Kilimanjaro II sank,  Tanzania/Zanzibar  Sewol Ferry capsized, South Korea  Banting boat sank of Kuala Lampur, Malaysia  MV Pinak ferry, Padma River, Bangladesh  Norman Atlantic ferry fire, Adriatic Sea | Ferry from Tanzania to Zanzibar capsized in storm., rough seas and high winds, as many as 290 passengers on ferry with maximum capacity of 230. 81 dead; 212 missing.  Sea Smooth Ferry collided with Lamma IV crew ferry at night, 39 deaths, 72 injuries  Ferry rolling in heavy seas, 5 passengers fell overboard, no attempt to rescue, 5 deaths  Inexperienced third mate at helm when overloaded ferry capsized in a treacherous channel. 304 deaths, mostly high school students, 22 of 29 crew members survived. Ferry was carrying 3X its permissible weight. Passengers were asked to stay in cabins rather than evacuate, while emergency dispatchers recommended evacuations. Some crew members reported to have returned to their cabins to retrieve items and change clothes. Required ballast had been removed to make room for the extra cargo. Illegal redesign of ferry increased capacity to 921 from 804  97 undocumented immigrants on wooden boat with capacity of 50-60, capsized in storm, 14 deaths  Ferry caps, expired license, Overloaded ferry capsized in swollen river waters. Crew disregarded warnings not to sail because of bad weather. About 110 perished out of 250 on the ferry with a capacity of 85.  Fire in cargo hold, perhaps by stowaways starting a fire for heat, bad weather, ferry had received list of safety defects December 19 by inspectors, 487 passengers (exact number unclear), 5 crew, 222 vehicles, 25 passengers and 3 stowaways lost at sea, several deaths in fire, which consumed 2 of the 4 lifeboats, water intake pipes of fire sprinkler system clogged with mussels, 477 persons rescued, 2 crew members of tug towing the disabled vessel died on December 30 when cable snapped | Captain, owner and company manslaughter charged with manslaughter, Tanzania Minister of Marine Transportation resigned  Sea Smooth captain convicted on February 13, 2015 of 39 counts of manslaughter and endangering the safety of others at sea- sentenced to 8 years. Lamma IV captain sentenced to nine months for endangering the safety of others. Retired senior boat inspector charged with perjury and the Marine Department Assistant Director charged with misconduct in office.  Captain arrested  Captain sentenced to 36 years for “homicide through willful negligence.” Chief engineer, who was accused of abandoning two crew members who could have been saved, received 30 years. 10 other crew members received 5–10 year sentences.  Coast Guard Captain, first on the scene, received 4 years for professional misconduct. The director and employee of the Korea Shipping Association (KSA) were sentenced for destroying evidence. Also prosecuted were 11 ferry and cargo company officials as well as port inspectors on embezzlement and accidental homicide charges. The owner’s son was sentenced to 3 years for embezzlement. Owner committed suicide.  President of ferry operator sentenced to 10 years. Four officers received sentences ranging from 3 to 6 years. Two officers received suspended sentences. KSA official sentenced to 3 years for letting the ferry leave port without checking its cargo and storage. Two port employees who loaded the ferry sentenced to two years.  South Korean Prime Minister resigned and apologized for the government’s mishandling of the ferry disaster.  The government strengthened maritime safety after the accident for passenger ships. The South Korea Coast Guard was disbanded.  Shipping agent and coordinator of the boat arrested for Anti-Trafficking and Smuggling of Immigrants  Owner, captain and 4 others arrested for murder  Master and first officer of ferry, legal representative and members of board of directors of shipping company arrested |
| 2/2/2015 | Kim Nirvana Ferry sank off Leyte, Philippines | The ferry capsized while making an abrupt turn 200 meters from port. About 200 on ferry with capacity of 178 passengers. 63 deaths. Coast Guard Lieutenant and apprentice seaman inspected ferry prior to departure. The 145 survivors included all 17 crew members. | Owner, captain 17 crew members and the 2 Coast Guard members prosecuted. The prosecutor dropped the multiple murder charges against the owner and 17 crew members 2 months after the tragedy. |
| 2/22/2015 | Collision, Padma River, Pakistan | ML Mostofa-3 ferry collided with a cargo ship, 150 on ferry with capacity of 100. About 70 deaths. | Captain and 2 crew members of the cargo vessel arrested. |
| 4/18/2015 | Smuggling Vessel, off Italy | 65’ Trawler smuggling refugees to Italy capsized with an estimated 900 drownings. | Captain arrested for multiple reckless homicides. Captain and crewmember also charged with illegal immigration. |
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| 6/2/2015 | Chinese cruise ship capsized in Yangtze River | Cruise ship Eastern Star (Oriental Star) capsized during a severe thunder storm. Vessel may or may not have received a severe weather warning. Only 14 survivors, including the captain and chief engineer, out of 454 crew and passengers on board. Other captains heeded weather warnings. | Captain and Chief Engineer detained for questioning. Government report recommended 43 be punished. |
| 7/2/2015  7/25/2015  12/31/2015  9/21/2016  10/15/2016  1/1/2017  1/28/2017  2/7/2017  11/12/2017 | Ferry capsized, Philippines  Al Warraq collision on Nile River  Kafr El-Sheikh ferry, Egypt sank, 17 deaths  Smuggling vessel capsized near Rashid, Egypt  Aung Soe Moe Kyaw 2 ferry sank, Myanmar  Zahro Express ferry, explosion and fire, Muara Angke, Indonesia  Catamaran ferry sank, Malaysia  Speed boat capsizes, Tawau, Indonesia  River tour boat overturned, Pavitra Sangamam, India | Ferry capsized with at least 59 fatalities, 145 survivors, including all 18 crew members.  Unlit barge collided with cruise ship at 11:00pm, 35 deaths  17 deaths, 5 rescued from unlicensed, overloaded ferry with capacity of 7 passengers which sank in poor weather  Boat smuggling migrants capsized 8 miles off Egypt, 450-600 migrants on board, hundreds drowned, only 163 rescued  Ferry capsized after striking a rock,  Over 300 passengers on ferry with official capacity of 36, captain first to jump ship, 73 deaths, 17 missing  About 230 on ferry licensed for 36 passengers, capsized after striking a rock, not licensed for this route, Captain fled when fire started, 23 deaths, 22 injuries  28 Chinese tourists on ferry, vessel in poor condition, not designed for these waters, capsized in heavy waves, 4 deaths, 5 missing  Speed boat with 15 passengers capsized in rough waves, 10 passengers died  River boat with a capacity of 25 had 44 on it when it struck a sandbar and capsized on Krishna River, 21 deaths | Captain and three crew members of barge arrested on charges of negligence. About 40 government officials standing trial for negligence  Captain and crew members charged with murder  5 officials from city’s Navigation Authority and Office for Boat Licensing detained. Head of River Navigation Authority in Fouh and head of Navigational Licenses charged with negligence  4 crew members arrested for manslaughter and human trafficking  Captain, three crew members and two port authority staff arrested, owner fled, Captain charged with manslaughter, causing a shipwreck, abandoning ferry while passengers still onboard, death by homicide, and negligent homicide  Captain arrested for rash handling and negligent homicide, 4 crew members also arrested  Captain and crew member charged with death by negligence, owner faced 6 charges, owner fled  Captain arrested  10 arrests include boat driver, owner of boating company, six investors in the company and 2 crew members, Tourism Department suspended 7 officials with possible criminal prosecutions to follow |
| 1. ***Pipelines*** | | | |
| 9/9/2010  11/22/2013 | PG&E Pipeline Explosion, San Bruno, California, United States  Sinopec gas pipeline explosion, Quindao City, Shanxi Province, China | Underground natural gas pipeline explosion, killing 8, 58 injured and 108 homes damaged  Oil pipeline leak, oil seeped into underground utility pipes, explosion, human error, 55 deaths, over160 injured | Pacific Gas & Electric Co. initially indicted on 12 counts on April 1, 2014, followed by a superseding indictment on July 27, 2014 for violation of the of the Pipeline Safety Act and one charge of obstructing the government investigation. Jury convicted PG&E of 5 counts of violating safety standards and 1 count of obstructing the federal investigation  9 arrests, 7 employees of pipeline company, 2 employees of city’s Economic and Technological Development Zone |
| 1. ***Railroads*** | | | |
| 8/20/1868  10/22/1895  5/22/1915  6/22/1918  12/4/1957  3/5/1967 | Abergele Rail Disaster, Wales, Great Britain    Montparnasse derailment, Paris, France  Multi-train collision, Quintinshill, Scotland, United Kingdom  Hammond Circus Train crash, Hammond, Indiana  Lewisham rail crash, North Lewisham, London, United Kingdom  Connington South rail crash, Huntingdonshire, United Kingdom | Train collided with cars (wagons) on main line, 2 cars contained 1,700 gallons of paraffin oil, crash and fire, 33 deaths  Speeding train derailed, sailed out of station, brakes failed, guard doing paperwork failed to apply handbrake, woman on street killed  5 trains, two on sidings,, collisions and fire, lax conduct and multiple rules violations by 2 signalmen, 227 deaths, including 215 soldiers,  Hagenbeck-Wallace Circus Train stopped by signals, when rear ended by Michigan General Train, engineer had little sleep in 24 hours, ignored 2 warning signals, crash and fire, 86 deaths, 127 injured  2 trains collided in heavy fog, first train stopped by signal under bridge, driver of second train failed to slow after 2 caution signals, bridge collapsed in crash, 90 deaths, 127 injured  Train derailed, signal light should not have said green, mishandling by signalman, 5 deaths, 18 injuries | 2 Brakemen acquitted of negligence  Locomotive driver fined 50 francs, guard 25 francs  3 charged with manslaughter in England, 1 of 3 charged with culpable homicide in Scotland, trials in Scotland, 2 convicted of culpable homicide, 1 sentenced to 3 years penal servitude, other to 18 months imprisonment, both released on December 15, 1918, released in 1916  Engineer and fireman criminally charged, mistrial at first trial, prosecutor dropped charges on June 9, 1920  Mistrial at first trial of signalman, acquitted at second trial of manslaughter  Judge directed acquittal verdict on manslaughter, defendant pled guilty to unlawfully operating the signal and points mechanism to endanger person so a railroad, sentenced to 2 years |
| 1/4/1987 | Trains collided, Chase, Maryland, United States | Passenger train collided with Conrail locomotives, who did not stop at the signal crossing. The Conrail engineer and brakeman tested positive for marijuana. 14 passengers and 2 Amtrak crewmembers died. | Engineer sentenced to 8 years on federal and state charges, served 4. Brakeman received immunity in exchange for agreeing to testify against the engineer.  Safety systems improved afterwards. Railroads have to certify their employees are properly trained, and qualified and have no drug or alcohol impairment for the preceding 5 years.  Congress enacted a statute requiring mandatory random drug-testing for all employees in safety- sensitive jobs in Department of Transportation regulated industries. |
| 12/12/1988  8/8/1996  9/19/1997  8/2/1999  10/5/1999  10/17/2000  5/10/2002  1/26/2005  4/25/2005  2/23/2007  4/28/2008  2/6/2011  7/6/2013  7/24/2013  7/15/2014  3/12/ 2015 | Clapham Junction collision, Great Britain  Watford rail crash, Great Britain  Train collision, Southall, South London, England  Head on collision, Gaisal Station, Assam, West Bengal, India  Paddington rail collision, Ladbroke Grove, England  Hatfield derailment, England  Potters Bar crash, London, England  Glendale train crash, California, United States  Amagasaki Railroad derailment, Japan  Grayrigg derailment, Cumbria, England  Train collision, Zibo, Shandong Province, China  Train/car collision, Dong Nai, Vietnam  Railroad Disaster, Lac-Megantic, Ontario, Canada  Train derailment, Santiago de Compostela, Spain  Moscow subway, Russia  Amtrak derailment, Philadelphia, Pennsylvania, United States | Crowded passenger train at 45mph rear  ended train stopped by defective signal caused by poor wiring, 35 deaths, 484 injuries  Train collision in station, improper position of speed restriction sign, automatic train protector (ATP) had not been attached to train, 1 death, 69 injured  Express train collided with freight train, 7 deaths, over 150 injuries. The passenger train was traveling 125MPH with a defective AWS (Automatic Warning System)  Express train struck stationary train waiting at signal, one train packed with soldiers and police, signaling error sent train on wrong track, 2,500 people on crowded trains, official death toll was 285, over 300 injured, both drivers died  Head on crash of two trains, combined speed of 209kmh, safety neglected to save costs, bad siting of signals, inexperienced driver received little training, 31 deaths, over 520 injured, both drivers died  Train doing 115mph on poorly maintained track, cracks in track, railroad warned of the dangers in December 1999, replacement rails never delivered, 4 deaths and 102 injuries  Poor maintenance (loose nut on spreader bars) caused derailment of high speed express train, 6 passengers and one in station died, over 70 injured, Network Rail owns and operates England’s rail network, Contractors Jarvis performed maintenance.  Metrolink train collided with SUV on tracts, the meth SUV driver apparently intended to commit suicide by train, but then abandoned the vehicle, 11 deaths, 100-200 injured  Express train going 116 km/h on tight curve with  posted speed limit of 70 km/h. 106 passengers and driver killed, 562 injured. Driver among deceased. Company had not installed an ATS System (Automatic Train Stop)  Train derailment due to poor maintenance (faulty points) , 1 death, 28 seriously injured, Network Rail (operator) experienced a number of accidents  Cars from first passenger train derailed onto adjoining track, 2nd train at 80km/h crashed into derailed cars, 72 deaths, 416 injured  Train collided with 6 cars, barriers at both end of bridge not lowered, inoperable RR signs, 2 deaths, 26 injuries  Oil train derailed at 1:15am in Lac-Megantic. 47 perished in the inferno. Engineer had improperly set the hand brakes, allowing the oil tank cars to roll free downhill.  Failure to decelerate before a tight curve, train going 121mph on curve posted at 50mph, driver on mobile phone just before crash, 80 deaths, 144 injuries  3 Metro subway cars derail, 24 deaths  Train going 106mph, over twice the speed limit 950mph) around curve, driver distracted, 8 deaths, over 200 injuries | British Rail fined £250,000 for violations of the health and safety act  Train driver acquitted of manslaughter in 1988  Railroad company and engineer charged with manslaughter through gross negligence. England’s law did not recognize corporate manslaughter. Charges were dropped against the railroad, which paid a £1,500,000fine for the safety violation of a defective. AWS. Charges dropped against the engineer  6 railway employees convicted in 2007 of negligence of duty, sentenced to 2 years, Railway Minister resigned, Gaisal Station Manager committed suicide, overall responsibility place on 35 railway employees  2004 Thames trains, operator of the trains, pled guilty, fined £2 million for health and safety violations, Network Rail, infrastructure manager, fined £4 million and assessed £250,000 in costs  5 managers and two companies charged with manslaughter and breach of health and safety violations in 2003, directed verdict on the manslaughter charge for all defendants on July 4, 2005, Balfour Beatty, maintained track, pled guilty to the health and safety charges, and fined £10 million, Network Rail, the operator, found guilty of the charges and fines £3.5 million  Charges dropped against insolvent Jarvis, Network Rail pled guilty to lack of inspection and maintenance, fined £3 million in 2011, no individual prosecutions  Juan Manual Alvarez charged with 11 counts of murder “with special circumstances,” received 11 consecutive life sentences with no possibility of parole on August 28, 2008  Safety Director of Railway Operations acquitted in 2012 of professional negligence resulting in death, three company presidents indicted in 2009 pursuant to citizen complaints, acquitted in 2013  3 Rail Networks employees arrested, but charges subsequently dropped, company pled guilty to violating the Health and Safety at Work Act of 1974, fined £4,118,037  Executive Vice President of Jinan Railway Bureau and 6 others referred to criminal prosecution, 31 other personnel disciplined  2 train operators, 4 railroad guards, and signal light controller arrested, 4 Sai Gon Railway employees sentenced to 3-5 1//2 years for dereliction of duty, taxi cab driver sentenced to 7 years  Federal government and provincial government separately brought charges against the corporation, train engineer, operations manager, and other officials, train manager, rail traffic controller, and operations manager acquitted of criminal negligence on January 9, 2018  October 6, 2015 Francisco Garzon, driver, charged with 80 counts of reckless manslaughter  Negligence charges brought against the deputy chief of subcontractors in repair division, senior executive in Metro’s repair department, Metro’s track supervisor, and assistant track supervisor.  Convoluted legal process, state prosecutor on May 9, 2017 declined to prosecute, municipal judge on May 12 ordered prosecution, involuntary manslaughter and reckless endangerment charges filed, charges tossed on September 12, 2017, second judge reinstated charges on February 6, 2018of reckless endangerment, involuntary manslaughter, and one count of causing a catastrophe |
| 2/2/2016  7/12/2016  11/9/2016  11/25/2016  8/11/2017  1/31/2018 | Bad Aibling, Germany  Puglia train crash, Italy  Croydon tram derailment, England  Semnan-Damghan collision, Semnan Province, Iran  Khorshid Station Train collision, near Alexandria, Egypt  Amtrak train crashed into garbage truck on tracks, Albemarle County, Virginia, United States | Head-on collision by 2 trains, dispatcher was playing video games on his cellphone just before collision, 11 deaths, 24 critically injured, 61 slightly injured.  Two trains on a single track collided head on, communication mistake between the stations at Andria and Corato, obsolete and unsafe radio system, 27 deaths, 54 injuries  Train derailed at 45mph on a sharp curve rated at 12mph, driver error, driver may have suffered from a “micro sleep,” 7 deaths, 62 injuries  Moving train crashed into stationary train, causing deadly fire, 45 deaths, 105 injuries, human error in control center  One train read-ended the other train, 44 deaths, 236 injured  Garbage truck on tracks, charter train carried members of Congress, families and staff to an annual retreat, one death, 2 injuries | Dispatcher charged with involuntary manslaughter.  18 under investigation, including the director general of the railroad and two station masters  Driver arrested on suspicion of manslaughter  Four arrests, the train driver of the second train and three in control center. Deputy Minister in transport ministry resigned  The two train drivers, their assistants, a railroad worker and a station manager arrested. All but one assistant driver scheduled for trial on manslaughter charges. The railroad authority chief resigned.  Garbage truck driver charged with involuntary manslaughter and maiming while driving under the influence |
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| **VIII. MISCELLANEOUS** | | | |
| 1. ***Cranes*** | | | |
| 2/11/2005  9/26/2006  3/15/2008  5/30/2008  7/15/2008  10/13/2013  5/30/2014  9/11/2015 | Crane collapse, Worthing, Sussex, England  Crane collapse, Battersea, London, England  Crane collapse, New York City, United States  Crane collapse, New York City, United States  Crane collapse, Cai Lan Province, Vietnam  Crane collapse, Dubai  Crane basket fell on Winters Bridge construction site, Sacramento, California  Crane collapse, Mecca, Saudi Arabia | Crane collapsed during dismantling, inadequate supervision of untrained worker, 2 deaths, 1 injury  Crane collapse killed operator and bystander, bolts failed, had similarly failed 2 months earlier, company did not adequately investigate the incident  6 ton collar securing crane to building came loose, crane collapsed killing 7, injuring 24  200’ tall rig collapsed on East 91st Street 14  stories up on 32 story apartment building under construction. Crane owner alleged to have cut costs too sharply with shoddy parts to save money. Crane operator and worker on ground died  Crane collapsed while being assembled, incorrect assembly process, 7 worker deaths, one injury  Giant crane collapsed t worksite near Burj Khalifa,  40 year-old crane with long list of deficiencies, hosted basket broke free, operator’s son and second worker fell 8 floors to their death, safety procedures not followed  1,350 ton crane collapsed onto the Grand Mosque during strong winds, killing 111, injuring hundreds. An engineer for the builder called it “An Act of God.” | EUROLIFT (Tower Crane) pled guilty in 2009 to violations of the Health and Safety at Work Act, fined £50,000, W. D. Bennett’s Plant & Services, crane lessor, found guilty on two charges  Company fined £750,000 and charged 100,000 in costs ten years later in 2016 for violations of Health and safety at Work statute, charged dropped against the company’s managing director  Contractor arrested on homicide and other charges, city inspector charged with falsely claiming he inspected the crane 11 days before the accident, judge acquitted rigger in non-jury trial of 7 counts of manslaughter, company also cleared, building commissioner resigned  Mechanic pled guilty to criminal negligent homicide; judge acquitted owner on 4 manslaughter charges 4 years after the accident  2 engineers arrested (head of engineering workshop and former head of machinery assembly department) for violating labor and safety regulations  Number of company officials arrested  Operator charged on December 21, 2016 with 2 counts of involuntary manslaughter and violating occupational safety or health standards, crane contractor fined $106,000, involuntary manslaughter charges dropped on May 1, 2017  14 employees of construction company on trial for negligence, damaging public property, and violation of safety rules. Mecca Criminal Court held no jurisdiction, Appellate court in May 2017 ordered trial to proceed | |
| 1. ***Demolitions*** | | | |
| 12/2/2006 | Bridge collapse, Bihar, India | 150 year old bridge being dismantled fell on train passing under, 347 deaths, 16 injured. | 2 engineers supervising demolition suspended, with cases to be registered against them. | |
| 6/5/2013  4/6/2015 | Demolition collapse, Philadelphia, Pennsylvania, United States  Wall collapse, Brooklyn, New York, United States | Wall collapsed during demolition onto nearby building, 6 deaths, 13 injuries, one of the victims was the daughter of the City’s Treasurer.  Unshored 14’ wall in trench collapses, inexperienced workers, work continued after ignoring warnings by safety inspectors | Operator pled guilty, sentenced to maximum 20 years, contractor found guilty on 6 counts of involuntary manslaughter, but acquitted of third degree murder charges.  Owner and his construction general contractor, Harco, found guilty of negligent homicide and four counts of reckless endangerment, case continued against subcontractor and 2 employees | |
| 1. ***Landfills*** | | | |
| 8/3/1999  10/1/2015  12/20/2015 | Cherry Hills Subdivision,  Antipolo City, Philippines  Santa Canterina Pinula,  Guatemala, mudslide,  Landfill collapse, Shenzhen, China | 58 deaths, several houses destroyed in landslide,  failure to follow plan  Mudslide resulted in 280 deaths, 70 missing  20 storey high landfill for of construction debris collapsed, sending wall of mud into neighboring industrial zone, insufficient soil compaction, ordered closed 5 months earlier 73 deaths, 4 missing. | Criminal information filed against President, general manager, and assistant general manager of subdivision developer  Mayor and former mayor arrested – had been informed of the risks  45, including almost 20 government officials, sentenced to prison, manager of company that managed the site and former head of Shenzhan Administration Bureau sentenced to 20 years, one official committed suicide | |
| 1. ***Scaffolding*** | | | |
| 12/24/2009 | Ontario, Canada | Scaffolding collapsed, 4 workers died in 13 story plunge, did not use safety lifelines, 5th worker injured with defective lifeline. 6th worker using lifeline uninjured. | 4 charges of criminal negligence against corporation, president of company, and 2 employees. Company pled guilty, the first Ontario corporation to plead guilty under Canada’s “Westway Act” for corporate liability. President pled guilty to 2 violations of the Occupational Health and safety Act – other charges dropped. | |
| 12/29/2014 | Tsinghua University High School, Beijing, China | Scaffolding collapsed at high school gym under construction, 10 deaths, 4 injured. | 14 construction managers sentenced a year later to 3 – 6 years. | |
| 3/25/2015  11/24/2016  7/21/2018 | Vun Ang Economic Zone, Vietnam  Fengcheng Power Plant scaffolding collapse, Jiangxi Province, China  Scaffolding collapsed on hospital under construction, Kandanchavadi, Chennai, India | 25 meters high, 40 meter wide scaffolding system collapsed, 13 workers died, 29 injured, 15 critically injured, violation of safety rules.  Scaffolding collapse on cooling tower under construction, 74 deaths, 2 injuries  2 residential buildings near hospital destroyed by flying debris, 1 death, 32 injured | 4 defendants sentenced to 2½ to 3½ years.  13 arrests, chairman and chief engineer  2 engineers arrested, charges filed against site supervisor and building manager – voluntarily causing grievous hurt act endangering life or personal safety of others | |

**IX. “Natural” Disasters**

1/26/2001 Gujaret Earthquake, India Destroyed many homes, Paldi Building 3 builders, architect, structural engineer,

Collapsed, 8 deaths, 4 injuries government officials, charged with death by

negligence, reduced to culpable homicide

(About 120 engineers and builders amounting to murder. 3 builders and architect

In Ahmedabad imprisoned) acquitted by judge in 2014

10/8/2005 7.7 Kashmir Earthquake, Margalla Towers collapsed, only structure Case filed against builders for inferior

Pakistan in Islamabad to collapse, 78 deaths, 84 construction, architect arrested in Greece in

Injuries November 2010, court had declared the incident

a natural disaster, and absolved the contractor

of responsibility

4/6/2009 Earthquake, L’Aquila, Series of minor quakes preceded large quake, Six scientists and public official indicted for

Italy 309 deaths, over 1,000 homeless, scientists and miscommunications of safety, convicted in

public official at a conference a week before October 2013, convictions of scientists

issued assurances of safety overturned in 2014, but upheld for the public

official, who said “There was no danger.” He

was acquitted of manslaughter on September 30, 2016 at retrial.

8/25/2009 Hurricane Katrina, New Hurricane struck New Orleans and the Gulf Doctor and 2 nurses charged with the mercy

Orleans, Louisiana, Coast, 1,834 fatalities, 135 missing, extensive killing of incapacitated patients under horrific

United States loss of power, failure of evacuation and poor conditions, charges dropped against doctor when

Initial emergency response the grand jury refused to indict, 2 nurses had agreed

to testify for the prosecution, 2 owners of nursing

home 112 miles south of New Orleans acquitted of

34 counts of extreme cruelty in failing to evacuate

the residents prior to the earthquake

11/25/2009 Jeddah floods, Saudi 2.76’ of rain fell in 4 hours, setting off flash 45 defendants convicted and 78 acquitted in

Arabia floods, extensive corruption revealed, homes November 2014, 320 to be tried, including

built in flood pathways, 123 deaths, 11,929 retrial of 45 previously acquitted, as of January

homes and 10,321 vehicles destroyed 2018, accused include public officials and

businessmen, 80% of charges include bribery,

also forgery and misuse of power, convicted

mayor fled Saudi Arabia

2/27-3/1/2010 Cyclone Xynthia, France Cyclone struck homes built in a “red zone,” Mayor sentenced to 4 years, officer in charge

which barred development, Lafaute-Sur-Mer, of building permits received 2 years, her son in

France especially struck hard, 29 deaths, charge of ensuring and monitoring the safety of

hundreds of homes flooded the seawall

3/11/2011 TEPCO Fukushima 9.0 Great East China earthquake struck Japan, Tokyo Prosecutorial review Board, upon the

Nuclear reactor complex, followed 41minutes by a 43-49’ high tsunami, petition of private citizens pursuant to Japanese

Japan which overwhelmed the 19’ protective seawall, law, reversed the 2013 prosecutorial decision not

knocking out the emergency generators for the to indict TEPCO officials. Former President and 2

cooling system, reactors originally met the safety Vice Presidents in charge of the nuclear reactors

standards during the 1960’s when built, but were indicted in 2016

not upgraded when risk parameters changed, 44

deaths around the complex, over 100,000

homeless from radiation contamination

2/10/2016 Building collapse, 6.4 Earthquake struck Taiwan on February 6, 2016, Developer and 2 other company executives

Tainan, Taiwan 17 story Wei-guan Golden Dragon Tower collapsed arrested for professional negligence resulting in

4 days later from shoddy construction, 166 deaths death

July 2016 Severe flooding, Hebei Substantial flooding in late July, 273 deaths, 115 Authorities suspend 4 public officials for failed

Province, China missing, issues are the lateness and inadequacy of relief efforts

of response effort

8/24/2016 6.0 earthquake in Amatrice, Public housing building in Piazza Augusto Sagnotti Manslaughter charges faced by two directors

Italy collapsed with 19 deaths; blocks not built to safety of construction company, a public housing

standards, incorrect calculations and poor worker, civil engineer, and former city councilor

materials

7/19/2017 Mexico City, Mexico 7.1 7 story building approved as “safe” collapsed, Builder arrested for negligent homicide,

earthquake killing two women. Building did not meet safety “Person” who approved the plans arrested

standards in a high-risk seismic zone,

foundations inadequate to support building

Elementary school collapsed, 37 deaths Construction supervisor arrested, charged with

homicide