Why Do Accidents Happen? A Content Analysis of Safety (CAP) Reports

Mehnaz Fatima Monamy and Debanjan Das, West Virginia University, USA

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The factory fire at Tazreen Fashions in 2012 and the collapse of the Rana Plaza in 2013 generated a massive outcry about the working conditions and labor relations in the Readymade Garment (RMG) industry in Bangladesh and led to the adoption of the multi-stakeholder agreements on Fire and Building Safety in Bangladesh (Accord) at the international level and the National Tripartite Plan of Action (NTPA) at the domestic level (Evans, 2015). The Accord is a legally binding agreement signed in May 2013 between more than 180 apparel corporations from 20 countries in Europe, North America, Asia, and Australia, two international trade unions, and seven Bangladeshi trade unions to improve safety and working conditions in the RMG industry(Salminen, 2018). The Accord and the NTPA are unique initiatives in which all the related stakeholders of the RMG industry of Bangladesh work together to better the industry.

The RMG industry is Bangladesh's largest in export revenues, yet workers are often underpaid and have to do unpaid overtime. Researchers also found that the RMG factories lacked proper lighting, had a poor air environment and did not have hygienic and safe lavatories for their workers (Asian Center for Development, 2020). Workplace harassment and economic exploitation are also widespread in the RMG industry of Bangladesh, where one study found that 68 percent of women workers were harassed in their workplace (Dash et al., 2019). However, there is a lack of research that explores the safety issues in the RMG factories, and therefore the purpose of this study was to investigate the safety drawbacks that were reported in the remediation proceedings on the Accord website. The theories of accident causation, specifically the human factor model, provide this study's theoretical foundation (DeJoy, 1988). According to DeJoy (1988), accidents are caused by human error, and proposed three categories of diagnostic factors for analyzing the determinants of error. The diagnostic factors include: person-machine communication, environment, and decision-making.

Content analysis approach was used to analyze the Corrective Action Plan (CAP) published in the remediation proceedings on the Accord website. As a part of Accord certification, a rigorous and transparent safety inspection of the structural, electrical, and fire safety is carried out by expert personnel under the supervision of the safety inspector, based on internationally recognized workplace safety standards. Accordingly, a CAP is suggested by the safety inspector, and the factory is required to implement the remediation plan within a scheduled time frame. Four hundred and twenty factories had completed the CAP, and all the CAP reports (N=420) were selected and analyzed. Since this is an exploratory study, an inductive approach was used to analyze the data. First, each piece of information in the CAP report was divided into a discrete unit for coding. Two independent coders assigned each piece of information in the product description a category. The inter-coder agreement was 92%. Any disagreement in coding was resolved through discussion.

The themes that emerged were structural safety issues (N=1827), electrical safety issues (N=4556), and fire safety issues (N=4624). Under the structural safety issue theme, 13 sub themes emerged. The sub themes were (i) high storage loading (N=288, 68.57%), (ii) discrepancies between structural drawings and built structure (N=286, 68.10%), (iii) cracks in building structures (N=256, 60.95%), (iv) inadequate concrete strength (N=256, 60.95%), (v) problem of water ingress (N=161, 38.33%), (vi) exposed reinforcement (N=159, 37.86%), (vii) non-engineered structure (N=129, 30.71%), (viii) undocumented extension in building structure (N=97, 23.10%), (ix) inappropriate slender columns (N=64, 15.24%), (x) beam failures (N=34, 8.10%), (xi) improper documentation of building (N=33, 7.86%), (xii) unprotected columns for vehicle impact (N=32, 7.62%), and (xiii) low capacity of cantilever (N=32, 7.62%).

The fire safety issue was further divided into 18 sub themes which were (i) boiler room, compressor, and combustible storage being close to fire rated construction (N=418, 99.52%), (ii) lack of safety inspection in accordance to state standards (N=417, 99.29%), (iii) lack of automatic fire alarm system (N=416, 99.05%), (iv) manual on-off switch for emergency lighting/ exit signage units (N=385, 91.67%), (v) use of exit stair during regular working hours (N=352, 83.81%), (vi) locked exit doors (N=322, 76.67%), (vii) use of collapsible gates and sliding doors at exit point (N=320, 76.19%), (viii) blocked exit paths (N=290, 69.05%), (ix) narrow exit path (N=286, 68.10%), (x) lack of smoke detecting systems (N=256, 60.95%), (xi) presence of exit stair enclosures in unsealed penetrations and openings (N=256, 60.95%), (xii) lack of stair designation and occupant load signs (N=193, 45.95%), (xiii) storing hazardous materials/ flammable liquid near fire rated construction (N=191, 45.48%), (xiv) no exit sign at exit point (N=160, 38.10%), (xv) lack of handrails in exit stairs (N=130, 30.95%), (xvi) inadequate standpipe system (N=130, 30.95%), (xvii) lack of visible and audible notification regarding fire incident (N=65, 15.48%), and (xviii) distance to dead end (N=32, 7.62%).

Finally, for the electrical safety issue theme, 22 sub themes were observed in this study which are as follows: (i) uncovered/unprotected cable channels (N=383, 91.19%), (ii) electrical single line diagram not available (N=354, 84.29%), (iii) inadequate earthing connection (N=321, 76.43%), (iv) lightning protection system not available (N=321, 76.43%), (v) absence of earth pit resistance (N=290, 69.05%), (vi) exposed steam line close to electrical installations (N=287, 68.33%), (vii) exposed wires/cables (N=287, 68.33%), (viii) absence of electrical safety program (N=258, 61.43%), (ix) multiple cables connected through a single point (N=257, 61.19%), (x) dust and lint in cables and transformer room (N=256, 60.95%), (xi) absence of thermographic scanning (N=225, 53.57%), (xii) overlap of high tension and light tension cables (N=223, 53.10%), (xiii) inadequate space around transformer (N=194, 46.19%), (xiv) bended power cable (N=192, 45.71%), (xv) open battery terminals (N=158, 37.62%), (xvi) wet floor (N=126, 30.00%), (xvii) oil leakage from transformer (N=97, 23.10%), (xviii) lack of inspection or maintenance record (N=66, 15.71%), (xix) shortage of electrical shock restoration (N=64, 15.24%), (xx) no periodical inspection & testing of electrical equipment (N=64, 15.24%), (xxi) using electrical room as maintenance room (N=63, 15.00%), and (xxii) using generator room for storage purpose (N=63, 15.00%).

Based on the findings, fire safety issues were found to be the highest and closely followed by electrical safety issues. It is worth noting that the Bangladesh RMG factories are still facing fire accidents, as the most recent fire accident occurred from a short circuit of power cables (Hassan & Osama, 2021). It was also interesting to see that out of 420 factories analyzed, 418 factories had boiler rooms, compressors, and combustible storage close to fire-rated construction. It was not surprising to see a recent news article highlighting a boiler explosion at Ambia Fashion in Chittagong, Bangladesh, injuring seven workers (Jasmin, 2022). Moreover, there are close to 4600 RMG units in Bangladesh, and only 420 factories had their CAP completed. This discrepancy is worrisome. The result clearly indicates the safety issues prevalent in the Bangladesh RMG factories. Future studies should investigate the motivation for factories to undergo Accord certification and what benefits they get from this certification so that other factories can follow suit.

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