Alex Diaz

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ENG 1121

Assignment: 1 half of Research Essay

Jeff Copper once emphasized safety by saying, “Safety is something that happens between your ears, not something you hold in your hands.” Mechanical Engineering involves the study of how forces interact with a certain body, and using that knowledge to develop new technologies that meet the needs of society. So how would a mechanical engineer approach this new technology? To a mechanical engineer, precision and accuracy is obligated because many jobs involve creating a product so people may utilize it. In that case, potentially any single flaw can or will affect the person buying the product. Hence, there have been cases in the past where mistakes have led to catastrophic outcomes because an engineer made as much as a single mistake. In essence, safety is extremely crucial to the Mechanical Engineering field and any design flaw or miscalculation of a product result in an accident.

Before any creation there’s an idea, and with that idea a design is generated. Software programs such as CAD, Inventor and Solidworks are all heavily used to design products in the Mechanical Engineering field. A design will always be the backbone of a product because it decides how big the product will be, the amount of weight it can withstand, the proper materials to use etc. All these factors considered in the design ultimately is what makes the product safe to use and ensures the liability of the product. So what would happen if there was no design? Dr. Berri, professor at the New York College of Technology, once said, “making a product without a design is like a doctor going to surgery without knowing where to properly cut.” Any mistake in the design can potentially be catastrophic such as the famous explosions at Chernobyl, Three Mile Island and Macondo deep in the Gulf of Mexico.

An explosion is a very common type of incident due to design flaws. In the industrial piping business, this type of accident is very common due to certain gases exceeding the maximum pressure they can handle and igniting. In history, there exist a handful of disastrous event that made newspaper headlines, most notably the oil spill at the Gulf of Mexico that recently occurred. Robert A Leishear, respected engineer and member of the ASHE B31.1 Processing Piping Design Committee, developed a theory that explains the cause of several famous pipe explosions including that in Chernobyl, Three Mile Island and the Macondo Well in the Gulf of Mexico. He suggests, “that if piping contains a flammable gas and there is an inrush of fluid into the piping, the gas can adiabatically compress to its auto-ignition point, and then the gas, given sufficient quantity and pressure, can ignite and explode(Leishear, “Pipeline Explosions: A New Theory”).” In other words, if there was disturbance in the flow of fluid, such as an abundance of sea water entering the pipe, and there exist a flammable gas their will inevitably be an explosion. So if an engineer is willing to pay billions of dollars in damage, they should avoid making the mistake.

Without a doubt, the worst part about making a design flaw would have to be the consequences. For example, the explosion at the Macondo well was developed very using a sophisticated design and had many safety factors in case something did go wrong. Unfortunately, the crew members at the time were very unexperienced with accidents that their respond time was too long. In essence, every safety factor in the design went to nothing and every other method took too long to perform that the explosion occurred. The New York Times Article, “Deepwater Horizon’s Final Hours,” states that, “With government inquiries under way and billions of dollars in environmental fines at stake, most of the attention has focused on what caused the blowout (Barstow).” While most people focused only on the actual cause, they failed to see that the oil spill would be hazardous to animals and generate such an insane cost. A design is extremely significant to any structure, but it’s not the only thing to take into account when it comes to Mechanical Engineering.