The Volkswagen Emissions Scandal: An Ethics Case Study

A Research Paper submitted to the Department of Engineering and Society

Presented to the Faculty of the School of Engineering and Applied Science
University of Virginia • Charlottesville, Virginia

In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science, School of Engineering

Kelsi Loudenslager
Spring 2020

On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

Advisor
Richard D. Jacques, Ph.D., Department of Engineering and Society

Introduction

In 2014, a study performed by West Virginia University revealed one of the largest scandals in automotive history. The study was designed to test the NOx emissions of several Volkswagen diesel cars while driving on the highway. The results exposed the company's deceit as the vehicles studied produced up to forty times the permitted amount of NOx gasses (Forsgren 2019). The purpose of this thesis is to determine why this scandal occurred. Additionally, this thesis will explore the role of company culture in making ethical decisions.

To examine this case, the events will be analyzed through the concept of normalized deviance. The concept of normalized deviance was first coined by Diane Vaughan in her book analyzing the challenger explosion. Vaughan defined it as "a long incubation period with early warning signs that were either misinterpreted, ignored, or missed completely" (Vaughan, 1996). Therefore, I will analyze the culture within the Volkswagen cooperation chronically from before scandal through to the company's current practices. Through this analysis, I seek to display the missteps that lead to the largest mistake in the company's history. Lastly, by exposing the company culture of Volkswagen I will argue that a scandal was only a matter of time.

Part I: Before the Scandal

In 2006, under the direction of CEO Bernd Pischetsrieder, VW created a 10-year plan to triple US sales. The plan relied on the sales of Clean Diesel vehicles (Parloff, 2018). Clean Diesel was based on the fact that diesel engines produce little to no C02 and greenhouse gasses. Therefore, the use of diesel engines may reduce the effects of climate change. However, diesel engines emit NOx which is one of the primary causes of smog (Forsgren, 2019). One method to clean diesel exhaust is to mix it with a substance called AdBlue. When the NOx and AdBlue

react nitrogen and water are formed. The tradeoff in the addition of AdBlue lies in the increased maintenance and weight of the vehicle. This tradeoff exists because an extra tank to contain the AdBlue must be added to the car and can either be large to lessen the number of refills or smaller in order to cut down on size and weight (Flender, 2019). The ambitious plan developed by Pischetsrieder sought to minimize this tradeoff and maximize sales.

Environmental Standards

The environmental standards throughout the world varied in both restriction and focus. European emissions standards focused on reducing the effects of global warming by limiting greenhouse gasses. In these locations, a diesel engine seemed a perfect solution. In contrast, in the US environmental regulation focused on clean air. In particular the Environmental Protection Agency's Clean Air Act (CAA). The CAA required all light-duty vehicles to satisfy tailpipe emissions standards for air pollutants, including NOx (EPA, 2019). This standard set the bar high for VW engineers to create a diesel engine that was low maintenance, low weight, and clean. Even stricter standards existed within the California Air Resource Board (CARB) as California sought to limit the smog in Los Angeles. These environmental standards exacerbated the need to find a middle ground between NOx emissions and maintenance requirements.

Employee Perspectives

In order to create a clean diesel vehicle, VW placed tremendous pressure on employees. In 2007, Martin Winterkorn took over the company as CEO. Winterkorn has been described as a demanding boss who abhorred failure. Former executives have described his management style as authoritarian and aimed at fostering a climate of fear (Glazer, 2016). From these reports, one

can begin to see how the culture incubated the scandal. The culture of fear that existed limited the number of employees willing to step forward and act as whistleblowers.

However, it was not just executives who felt this growing pressure engineers faced the largest challenge. As early as 2007, Wolfgang Hatz, a high-level VW supervisor was captured on video saying, “The CARB is not realistic. We can do quite a bit, and we will do quite a bit. But the impossible we cannot do” (Parloff, 2018). This testimony displays the culture within the company made employees reluctant to speak out. Further, this quote encapsulates the seemingly impossible task the executives and marketing team placed on engineers. A former employee Walter Groth said the pressure put on an engineer in such an environment can be enormous. He also mentioned that if one fails the expectation is to either be reprimanded by a manager or fired. Further, it has been reported that VW had a code of conduct that requires employees to follow local and international laws and regulations. However, when VW engineers requested the addition of AdBlue tanks to lower NOx emissions their request was denied (Flender, 2019). The rejection of AdBlue tanks made the task of clean diesel impossible for the engineers tasked with living up to the promises of the CEO.

The Creation of the Defeat Device

The software later named the defeat device was created in order to cheat testing. The created software was extremely sophisticated; it monitored speed, engine operation, air pressure, and even the position of the steering wheel in order to determine if the vehicle was being tested. If the program determined the car was in a testing scenario then it would enter a safety mode with decreased power and performance effectively decreasing NOx readings (Hotten, 2015). News of the defeat device within the company reached Audi managers in 2008. Members of the

engineering team sent news of the software to the head of the group Zaccheo Pamio warning that the software was illegal and highly problematic in the US. However, no actions were taken to rectify the situation (Forsgren, 2019). The lack of action on the part of the managers suggests that cheating in such a way was not viewed as more important than the potential of increased sales. This culture was only reinforced by the authoritarian rule driven by Winterkorn.

Part II: The Scandal Breaks

The advertising of a Clean Diesel car achieved the original goal of tripling US sales. However, in 2014 West Virginia University published a study in which two models of diesel-powered VWs were studied in the lab and on the road. The results of this study displayed that on the road the vehicles emitted 35 times more NOx than in the lab (Forsgren, 2019). After this study was published, the EPA and CARB began pressuring VW.

Initial Response

When news of the WVU study reached VW executives they adamantly denied any wrongdoing. VW's response to the crisis was led by Oliver Schmidt. At the time, Schmidt worked as the General Manager in charge of the Environmental and Engineering Office and his main responsibility was communicating and coordinating with the EPA and CARB. For more than a year, Schmidt dismissed concerns with promises of recalls and simple software fixes (Forsgren, 2019). Schmidt was well aware of the defeat device but continued to hide it. This act suggests within VW the defeat device was not viewed in the same unethical light as it was outside the company. Additionally, Schmidt's actions could imply that he was afraid to admit the truth of the discrepancies in the published study.

Further, Winterkorn encouraged Schmidt's actions. When Winterkorn and Schmidt met in 2015, Schmidt told Winterkorn in unmistakable terms that VW had been cheating. Instead of reporting this, Winterkorn told Schmidt to meet with the EPA and lie. In August of 2015, Schmidt met with EPA officials and recited a script crafted by high-level VW officials detailing upgrades and hiding all cheating. The continuation of blatant lying in response to the scandal further suggests the cultivation of a culture in which lying is not abnormal.

Stepping Forward

As meetings with the regulators continued, one VW engineer stepped forward. In a meeting between CARB and VW on August 19th, 2015 Stuart Johnson the head of VW's Engineering and Environment Office in the Auburn Hills revealed the existence of a defeat device (Vellequette, 2017). In this case, Johnson was the first whistleblower. It is clear from Johnson's actions that he was aware VW was using unethical means to advance so why did he wait so long? One explanation for the lack of immediate action comes from the fact that admitting the fault within the vehicles directly violated the orders Johnson received from his superiors. Further, the culture within the company promoted fear. From other employee perspectives, it seems VW employees were directly influenced to hide any wrongdoing. This culture of cheating and lying may have been seen as acceptable within the cooperation; however, when exposed to public VW employees felt uneasy. This suggests employees knew the vehicles they were producing contained illegal technology but did not blow the whistle until later when questioned about irregularities in emissions data. After Johnson's admission, the news of the defeat device was released to the public on September 18th. Five days later, Winterkorn stepped down from the position CEO (Forsgren, 2019).

Schmidt's Consequences

After news of the defeat device reached the general public, stock fell 1.9% (La Times, 2019). Additionally, the EPA launched a full investigation accusing 39 individuals of fraud and 13 others of fraud and false advertising. Within the US, both Pamio Schmidt and were arrested. Schmidt later pleaded guilty stating, "I've learned that my superiors that claimed to me to have not been involved earlier than me at VW knew about this for many, many years. I must say I feel misused by my own company" (Forsgren, 2019). After being sentenced to seven years imprisonment Schmidt said, "I accept responsibility for the wrongs I committed … I made bad decisions and for that I am sorry. For a time, I was in denial that I personally did something wrong. I justified my bad decisions by telling myself that I was obligated to stick to my superiors' instructions (Forsgren, 2019). Schmidt's testimony displays the result of a company culture that pushes its employees to compete in order to climb the corporate ladder. The hierarchical nature of VW's led Schmidt to continue to work and lie in order to appeal to his superiors. Schmidt's outcome can serve as a cautionary tale for those who chose to continue the unethical practices of the cooperation in which they operate.

Schmidt's actions can be directly contrasted with Johnson who stepped forward. After coming clean, Johnson faced no legal repercussions while Schmidt was sentenced to seven years. This juxtaposition displays the need for VW to have a culture in which whistleblowing is protected. If such a policy existed the use of a defeat device may not have progressed as it did.

Corporate Consequences

Initially, Michael Horn America's VW CEO asserted that the defeat device was created by a group of rogue engineers. However, the number of managers charged and investigated

suggests many more than a rogue group knew about the defeat device. This widespread knowledge further exposes the number of employees who did not expose the truth until faced with criminal charges.

On the corporate side, VW tried to appease the public by recalling the affected vehicles which totaled to about 11 million cars worldwide (Hotten, 2015). Within the US, consumers were given the option to trade in their car for cash to get another car. However, in Europe VW insisted the affected cars could simply have the software tweaked to meet the less rigorous emissions standards (Phys.org, 2018). Volkswagen reluctance to provide compensation to European consumers suggests they only sought to meet minimum requirements rather than truly create clean vehicles. This displays that the true reason VW created the so-called clean diesel engines was only for marketing purposes not advancing sustainable transportation. Therefore, VW intentions further created a company culture based on overtaking its main competitor Toyota rather than truly providing consumers with a clean vehicle.

In 2017, VW was charged by the US Department of Justice and plead guilty to 3 felony counts: Participating in a conspiracy to violate the Clean Air Act, Obstruction of justice for destroying documents related to the scheme, and Importing these cars into the US by means of false statements about vehicles' compliance with emissions limits (Kennedy, 2017). In the aftermath of the scandal, it has been reported that VW has paid more than 26 billion euros in fines and is still under investigation in the UK, Italy, France, South Korea, Canada, and Germany (Phys.org, 2018).

Further, the scandal had larger impacts on the diesel industry as a whole. Although still popular in Europe due to a favorable tax regime, the sales of diesels have plummeted. Additionally, the product is now highly scrutinized (Kool, 2015). Additionally, the discovery of VW's defeat device has encouraged further investigations into other makers' diesel vehicles. For example, France is now investigating Renault, Peugeot, and Fiat.

Part III: Change in Leadership

When Winterkorn stepped down, it became evident that a cultural change was needed within VW. Winterkorn left the company only five days after the scandal became public. Since the initial scandal broke, Winterkorn has been charged with fraud over, embezzlement, and violating competition law in both Germany and the US. Additionally, prosecutors alleged that Winterkorn was aware of the data manipulation as early as 2014 (Kottasova, 2019). This accusation reinforces the employee testimonies stating Winterkorn was extremely authoritarian. In order to move on from the scandal, the company needed to demolish the current culture. This establishment of a new culture fell to the new CEO Mattias Müller.

Whistleblower Policy

In 2015 after the initial scandal broke, VW launched an internal investigation. To encourage employees to come forward, an amnesty program was created. This program assured lower-level employees would not be punished for coming forward; however, this program did not apply to managers (Goodman, 2015). It is reported that roughly 50 employees came forward once this program was put into effect (Boston, Varnholt, and Sloat, 2015). This report further emphasized that the scandal was not the work of a handful of rogue engineers, but rather a larger portion of VW who did not speak up until after the scandal was exposed. Additionally, the actions of these employees suggests that prior to the amnesty program they did not want to step forward. One reason for this hesitance could be because the employees did not feel like they would be heard. Another reason for this lack of action could be that the employees felt they would be fired if they revealed any information regarding the scandal. This fear created by VW supervisors and executives is another example of the harmful culture at the company.

Before the amnesty program was created, one VW employee tried to blow the whistle but was not protected. In early 2016, an employee in Michigan claimed that VW continues to retaliate against those who question the company's actions. The man believes the company fired him because he threatened to expose that VW illegally deleted data shortly after the scandal broke (Kelton, 2016). This testimony displays that the culture within VW is rooted deeply and may not be as easy to deconstruct as it appears on paper. Further, the accused reactions of the company display the potential outcome for others who may have come forward sooner with evidence of the scandal.

Takeaways

There are multiple important lessons that can be learned through the VW emissions scandal. First, the importance of creating an ethical company culture should be a top priority. Throughout the beginning stages of this case, it is clear that VW main focus was increasing sales in order to surpass Toyota. When the metrics required to a clean diesel vehicle could not be met VW chose to cheat. This displays the true priorities of the company which was to sell an idea to consumers rather than a working product. Secondly, the need for open and free communication between management and engineers is a major concern. One reason for the scandal was CEO Winterkorn continued to push an idea of clean diesel vehicles despite the engineers' inability to make a vehicle that met all required standards. This scandal could have been avoided if the engineers had enough faith in the company to admit when they could not meet advertised metrics. Additionally, if upper management had communicated with the engineering department prior to advertising clean diesel vehicles the company may not have felt the need to cheat. Another lesson that can be taken from this case is the importance of whistleblower protection. If employees within VW had enough confidence in their job security when they brought

wrongdoings to the attention of management then perhaps more employees would have stepped forward sooner. Lastly, this case displays the need for checks and balances within management. From the employee testimonies discussed in this case study, it is clear a hierarchical system was in place. This system allowed unethical actions to continue under direct supervision. Therefore, one way to avoid the growth of these systems is to bring in outsiders. For example, when Schmidt met with Winterkorn to discuss the EPA allegations Winterkorn encouraged Schmidt to lie. If another member of the cooperation who was not directly involved with this scandal was present at the initial meeting between Schmidt and Winterkorn, Schmidt may have faced a different outcome.

Part IV: Conclusion

Normalized deviance occurs when a company chooses to ignore early warning signs of a larger problem. In the case of the Volkswagen emissions scandal, it is clear from the beginning VW ignored the signs of a toxic culture. The culture within the company promoted ruthless competition with little care for ethics. When a few employees did try to speak out they were silenced or simply ignored. Therefore, it is clear Volkswagen was operating in a deviant state from what was expected.

From this case study, important lessons in management and communication can be gained. In order to avoid future scandals companies in similar positions to VW need to encourage employees to ask questions when actions seem unethical. Additionally, companies need to promote communication through different management levels and through parallel levels. These parallel levels can then serve as checks and balances. Lastly, companies need to incentivize whistleblowing in order to check their operators.

References

Boston, W., Varnholt, H., & Sloat, S. (2015, December 10). Volkswagen Blames 'Chain of Mistakes' for Emissions Scandal. Retrieved April 23, 2020, from https://www.wsj.com/articles/vw-shares-up-ahead-of-emissions-findings-1449740759

Five things to know about VW's 'dieselgate' scandal. (2018). Retrieved 28 October 2019, from https://phys.org/news/2018-06-vw-dieselgate-scandal.html

Flender, S. (2019). The lie of clean Diesel. Retrieved 5 December 2019, from https://medium.com/swlh/the-lie-of-clean-diesel-f55b75031066

Forsgren, R. (2019). *Dieselgate: A Case Study in Engineering Ethics* [Ebook]. NASA. Retrieved from https://appel.nasa.gov/wp-content/uploads/2019/05/508_Dieselgate_Study_04.pdf

Glazer, R. (2016, January 8). The Biggest Lesson from Volkswagen: Culture Dictates Behavior. Retrieved April 20, 2020, from https://www.entrepreneur.com/article/254178

Goodman, L. (2015). Why Volkswagen Cheated. Retrieved 5 December 2019, from https://www.newsweek.com/2015/12/25/why-volkswagen-cheated-404891.html

Hotten, R. (2015). Volkswagen: The scandal explained. Retrieved 28 October 2019, from https://www.bbc.com/news/business-34324772

Kelton, E. (2016, June 29). 14.7 Billion Reasons Why Volkswagen Should Have Welcomed Whistleblowers. Retrieved April 20, 2020, from https://www.forbes.com/sites/erikakelton/2016/06/29/14-7-billion-reasons-why-volkswagen-should-have-welcomed-whistleblowers/#353496697500

Kennedy, M. (2017). Volkswagen To Plead Guilty, Pay $4.3 Billion In Emissions Scheme Settlement. Retrieved 28 October 2019, from https://www.npr.org/sections/thetwo-way/2017/01/11/509318791/volkswagen-to-plead-guilty-pay-4-3-billion-in-emissions-scheme-settlement

Kool, T. (2015). The Volkswagen Scandal Is Bad News for Diesel. Retrieved 28 October 2019, from https://time.com/4048247/volkswagen-scandal-bad-diesel/

Parloff, R. (2018). How VW Paid $25 Billion for Dieselgate — and Got Off Easy. Retrieved 28 October 2019, from https://fortune.com/2018/02/06/volkswagen-vw-emissions-scandal-penalties/

Vaughan, D. (1996). The Challenger launch decision: Risky technology, culture, and deviance at NASA. Chicago: University of Chicago Press.

Volkswagen bosses charged in Germany over diesel scandal. (2019). Retrieved 28 October 2019, from https://www.latimes.com/business/story/2019-09-24/volkswagen-officials-charged-germany-diesel-emissions-scandal

Volkswagen Clean Air Act Civil Settlement. (2019, October 31). Retrieved April 23, 2020, from https://www.epa.gov/enforcement/volkswagen-clean-air-act-civil-settlement