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Whistle-Blowing by Engineers and Reverse Whistle-Blowing on Engineers

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Abstract

This paper introduces two case studies in engineering ethics related to white-collar crime and whistle-blowing lawsuits. In these case studies engineers were employed by corporations that benefited from employee criminal behavior. These employees were fired and filed wrongful-termination lawsuits claiming whistle-blower protections. These lawsuits, as well as Department of Justice guidelines, created strong incentives for the corporate employers to demonstrate that the engineers, not the corporations, were at fault for the criminal behavior.

Introduction

Whistle-blowing on employers who commit dangerous or illegal acts have been discussed in many engineering ethic texts and articles. Some authors have attempted to delineate under which circumstances whistle-blowing is allowed and when it is ethically mandatory[1]. Others lionize whistle-blowers as "saints of secular culture"[2]. When discussing whistle-blowing it is important to emphasize that legal protections for whistle-blowers are uncertain. Further, the financial and personal costs of whistle-blowing can be staggering.[3]

One aspect of whistle-blowing that has not been covered well is the negative consequences that may result from filing a wrongful-termination lawsuit claiming whistle-blower status. Some potential negative consequences of whistle-blower lawsuits are illustrated by two case studies presented below. These two case studies both involve engineers who sued former employers claiming whistle-blower protections.

Case 1: Scapegoat Engineer at Davis-Besse Nuclear Power Plant?

First Energy Nuclear Operating Co. (FENOC) operates the Davis–Besse Nuclear Power Station in Ohio. FENOC and its parent company FirstEnergy Corporation have a long history of serious safety, environmental, and management problems. For example:

- The cause of the regional blackout of August 2003 has been attributed to FirstEnergy[4];
- In 2005, FirstEnergy settled a major lawsuit with the Environmental Protection Agency (EPA) and the Department of Justice (DOJ) for violations of the Clean Air Act. The civil penalty levied was the second largest similar penalty against a US power plant.[5]
- Other than the *Three Mile Island 2* plant, Davis-Besse has arguably the worst safety record in the US nuclear industry. Davis-Besse had 6 of the 34 significant "accident sequence precursor" incidents in the US between 1969 and 2005.[6]

The reactor at Davis-Besse is a pressurized water reactor. Nuclear fission is used to heat pressurized water, at 14 MPa, (2000 psi). The reaction rate is controlled by control rods and introducing (or removing) boric acid from the cooling water.

One of the problems associated with boric acid is that it is corrosive to steel structures. This problem was well known in the industry. In particular, if some of the high-pressure cooling water leaked out of the reactor head, the water would rapidly evaporate leaving deposits of boric acid. Further, it was known that one of the most likely points of leakage was where the control-rod-drive mechanisms (CRDM's) penetrated the reactor head (see Fig. 1). Davis-Besse's reactor head has a total of 69 CRDM's.

Rates of corrosion of the reactor head can be reduced by periodic inspections of the head and removal of any boric acid discovered. [7] These inspections can best be performed when the plant is shut down periodically for refueling. More recently at Davis-Besse, these shut downs took place in even numbered years. The 10th through the 13th refueling shutdowns occurred in1996, 1998, 2000, and 2002 respectively.

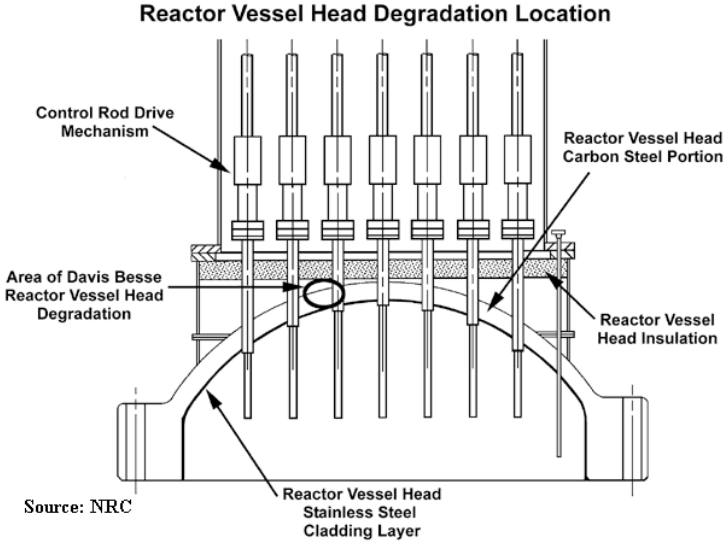

FIG. 1: Diagram of a reactor head with CRDM's. Photo: NRC.

Davis-Besse managers had long known of the potential for corrosion due to boric acid deposits. In fact, there had been three delayed or ignored efforts to address these concerns.[8] During the 1998 refueling outage photographs of the reactor head indicated substantial deposits of boric acid (see FIG. 2). During that reactor head inspection, the views of 19 of the 69 CRDM's were obscured by boric acid deposits[9]. In addition, one of the CRDM flanges leaked. In spite of this evidence of substantial boric acid deposits, the reactor head had never been cleaned of boric acid.[10] Further, the leaking flange was left unrepaired.[11]

In July of 1999, Andrew Siemaszko was hired at Davis-Besse as *Lead Nuclear Engineer* with responsibilities for the reactor coolant system. Siemaszko soon learned about the deposits of boric acid and the leaking CRDM flange. He initiated a campaign to prepare for clean up and repairs on the next fuel outage, scheduled for the next spring in 2000.

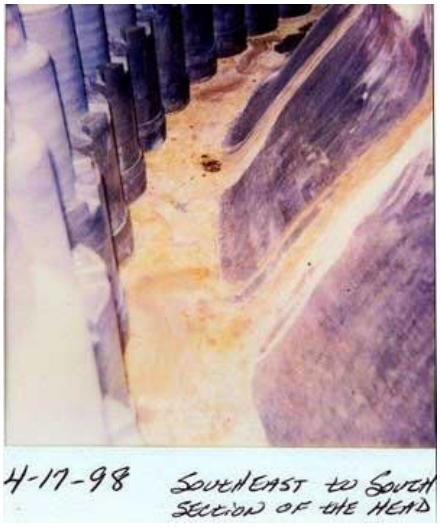

FIG. 2 "White Photo" illustrating boric acid on the reactor head. Photo taken in 1998. Photo: OhioCitizen.org.

FIG. 3 "Red Photo" illustrating boric acid on the reactor head. Photo taken in 2000. Photo: Ens-newswire.com.

To facilitate cleaning Siemaszko requested that access holes be added. The request was denied as requiring too much time. Without the access holes, the boric acid would need to be removed manually. During the refueling outage in 2000, scaffolding was erected near the reactor head. Siemaszko's crew had to manually remove the boric acid using water and a crowbar.[12] Cleaning started on the morning of April 28, 2000. The work was slow. After twelve hours of work Siemaszko dismissed his crew for the day to avoid overexposing the crew to radiation. When they left, they expected to return the next day to continue cleaning the reactor head of boric acid.

When Siemaszko returned the next morning the scaffolding and cleaning equipment had been removed. He immediately inquired of management why the cleanup operation had been aborted. He was told that he would have to wait until the next refueling in 2002 to finish the cleaning.

As part of the paperwork associated with this activity Siemaszko wrote:

> *"Accumulated boron deposited between the reactor head and the thermal insulation was removed . . . no boric acid-induced damage to the head surface was noted during the subsequent inspection."*

In addition, on a work order dated April 25, 2000 Siemaszko wrote: "*work performed without deviations.*"[13]

In spite of the unfinished cleaning job, Siemaszko was publicly congratulated for his efforts to clean and inspect the reactor head in the *Insider*, (a newsletter at Davis-Besse). The article in the *Insider* stated that:

"The Reactor Head was successfully cleaned yesterday, thanks to Andrew's efforts…This is the first time in Davis-Besse's history that the Reactor head has been cleaned. Andrew was a salesman to management… because he felt so strongly about the need to successfully clean the Reactor Head."[14]

In 2001, the Nuclear Regulatory Commission (NRC) issued *NRC Bulletin 2001-01*, requiring FENOC to report on the plans at Davis-Besse to detect cracking of the reactor head. Inspecting the reactor head would require shutting down the plant. Due to the high cost of such a shutdown, FENOC chose not to inspect the nozzles until the scheduled refueling outage in early 2002. However, FENOC had to demonstrate that they could safely operate Davis-Besse after December 31, 2001.

In an effort to demonstrate that Davis-Besse could operate safely after 2001, FENOC submitted a series of letters to the NRC. Included in these letters was information about past inspections of the reactor head. Siemaszko contributed information about his 2000 inspection as well as prior inspection. Based on these responses, FENOC convinced the NRC that Davis-Besse could operate safely until the refueling outage scheduled for early 2002.[15]

During the next refueling outage in early 2002 the boric acid deposits on reactor head were finally cleaned. Unfortunately, this process revealed that the boric acid had corroded the reactor head leaving a football-sized cavity (FIG. 4). Only the thin stainless steel cladding (see FIG. 1) contained the high pressure coolant in the reactor vessel. This represented one of the most serious safety breaches in US nuclear history.

FIG. 4. Cutout from the reactor head with the football-sized cavity. See FIG. 1 for the location of the cavity in the reactor head. Photo: Blog.cleveland.com.

As a result of this serious breach of safety, 18 Davis-Besse employees were disciplined. Some were transferred, some reprimanded. Others, including Siemaszko, were given an option

to resign. Siemaszko declined to resign. Being concerned that quitting might indicate that he was guilty of misconduct, Siemaszko chose to be fired.[16]

Shortly after being fired Siemaszko filed a whistle-blower lawsuit against FENOC with the Occupational Safety and Health Administration claiming that he was fired for his efforts to raise concerns about safety at Davis-Besse.

FENOC defended itself by claiming that:

- "Siemaszko failed to follow the Boric Acid Corrosion Control procedure and inaccurately recorded the results of his 2000 … inspection and cleaning activities", and
- "Siemaszko was a key technical contributor to the Company's response(s) to NRC Bulletin 2001-01… which contained inaccurate and/or incomplete statements."[17]

Siemaszko's case was dismissed by OSHA in June of 2003.[18]

Siemaszko's problems did not end there. In April of 2005 Siemaszko was banned from working in the nuclear industry for five years.[19] Further, in August of 2008 Siemaszko was convicted in federal court for "concealing information from and making false statements to" the NRC. Specifically, the Department of Justice, (DOJ), states that Siemaszko:

- concealed "the condition of Davis-Besse's reactor vessel head",
- concealed "how poor past inspections of that head had been",
- approved "false statements about the procedures to conduct the past inspections", and
- lied "about the extent of inspections done in 1996, 1998 and 2000."[20]

The prosecution of Mr. Siemaszko was met with skepticism by many. For example, the Union of Concerned Scientists claimed that Siemaszko was "being used as a scapegoat" and that "[FENOC] and the NRC deserve the blame, not an engineer who was simply trying to do his job and keep the plant safe."[21] Even the federal judge that presided at Siemaszko's trial had his doubts stating that the conviction was "a close case".[22]

For its part in the deception, FENOC "agreed to pay $28 million in penalties, restitution, and community service projects as part of an agreement to defer prosecution of the company"[23].

Case 2: Boeing's Purloined Papers

In the late-1990's McDonnell-Douglas and Lockheed Martin were in competition over a long-term contract with the US Air Force's Evolved Expendable Launch Vehicles (EELV) program. EELV's are advance rockets that were designed to replace the Atlas II, Delta II, and Titan IV rocket boosters.[24]

William Erskine was an engineering manager in McDonnell Douglas' EELV group. Erskine was approached by Kenneth Branch, an engineer in Lockheed Martin's EELV group.

Branch hinted that he could bring proprietary documents related to Lockheed Martin's EELV project in exchange for employment.[25] Branch was offered a position as a *Senior Engineer/Scientist*. In early 1997, Branch left Lockheed Martin for his new career at McDonnell Douglas. Later that year, McDonnell Douglas and Boeing merged to form *The Boeing Company*.[26]

Shortly after Branch left Lockheed Martin, a fellow employee reported seeing him with proprietary Lockheed Martin documents, prompting an internal investigation. The investigator reported that Branch did not have any proprietary Lockheed Martin papers.[27]

Boeing was pleased in late 1998 when the first round of EELV contracts was awarded by the Air Force. It was generally thought that Lockheed Martin was a superior rocket builder. Evidently, Boeing's lower prices helped Boeing to win 19 of those first 28 EELV rockets.[28]

Again, in June of 1999, a Boeing employee made an internal report claiming that Branch had proprietary Lockheed Martin documents. A Boeing attorney was assigned to investigate. That attorney informed the Air Force that seven pages of inconsequential Lockheed Martin data had been found. Further, he reported that only Branch and Erskine had seen that data.[29] In August of 1999, both Branch and Erskine were fired for possessing proprietary Lockheed Martin documents.

Erskine and Branch both sued Boeing for wrongful termination. They claimed that Boeing had fired in an effort to cover up a company policy to illegally obtain sensitive Lockheed Martin data. Boeing denied their accusations, winning the lawsuit without a trial in 2002.[30]

Erskine and Branch's legal problems were not over. As a result of revelations made in the course of their whistleblower lawsuit, Lockheed became aware of the extent of the purloined documents.[31] Lockheed notified federal authorities. The Defense Criminal Investigative Service investigated. In 2003, both Branch and Erskine were indicted on federal charges of conspiracy, theft of trade secrets, and violating the Procurement Integrity Act.[32]

Boeing's internal investigation grossly underreported the amount of purloined papers and the number of individuals involved. Air Force personnel found 141 documents, (consisting of 3,800 pages), that apparently originated at Lockheed. Of these documents, 36 were labeled "*Lockheed Martin Proprietary or Competition Sensitive*". Air Force staff determined that, 'possession of these proprietary documents by a competitor could have had a "high" or significant chance of affecting the outcome of a competitive bid.'[33]

Other Boeing employees were using stolen proprietary data. The DOJ claimed that "a [third] Boeing engineer, a Boeing parametrician, a Boeing manager, and a Boeing marketing director" used stolen proprietary data.[34]

Branch and Erskine's criminal cases were resolved by 2006. Branch pleaded guilty to obstruction of justice. His sentence was one year of probation, including six months of home detention. In addition, he paid $6,000 in fines. Erskine was offered a pre-trial diversion. That is, charges against Erskine were dismissed so long as he stayed "clean" for a year.[35]

As a result of this scandal, the Air Force sanctioned Boeing by denying it about $1 billion of contracts.[36] In June of 2006, Boeing agreed to pay "a record $615 million settlement to resolve criminal and civil allegations that the company improperly used competitors' information to procure contracts for launch services worth billions of dollars"[37] as well as other criminal allegations.

Unintended Consequences of Whistle-Blowing Lawsuits

When an employee (or former employee) files a whistle-blower suit against an employer the employer has a strong incentive to rebut the accusation. One means of rebuttal is to obtain evidence implicating the employee, not the employer, as the cause of the illegal or harmful activity in question.[38]

Such was the case with Siemaszko, Branch and Erskine. Each of these filed wrongful-termination lawsuits claiming whistle-blower status. The result was that both FENOC and Boeing made concerted efforts to gather evidence that would demonstrate the culpability of the whistle-blowers for the crimes.

In the case of Branch and Erskine, the extent of the illicit Lockheed documents was unknown outside of Boeing until it was revealed as a result of their wrongful-termination lawsuit.[39] Thus, it is likely Branch and Erskine would have never been criminally prosecuted had they not filed a wrongful-termination lawsuit claiming to be whistle-blowers.

In Siemaszko's case, the negative publicity produced when Siemaszko sued FENOC claiming whistle-blower status created a strong incentive for FENOC to find and publicize evidence of Siemaszko's failings.[40] As with Branch and Erskine, this public airing of Siemaszko's errors and omissions likely acted as a lighting rod for criminal prosecution.

In addition to defense in a whistle-blower lawsuit, federal guidelines for prosecutors gives corporations engaged in criminal activity strong incentive to blame employees. It seems likely that the management at Boeing either encouraged or was complicit with the illegal use of Lockheed data. It also appears likely that FENOC management bore a substantial portion of the blame for the corroded reactor head and deceiving the NRC. Yet in both cases engineers were convicted of crimes while the corporations avoided criminal prosecution.

Legally, corporations are treated as artificial persons. Hence, corporations may be prosecuted for criminal activity. Unfortunately, there are serious unintended consequences that result when corporations are criminally prosecuted. For example, consider Arthur Andersen the accounting firm that assisted Enron's management to commit fraud. Arthur Andersen LLP[41] was prosecuted and convicted of obstruction of justice. Prior to the Enron scandal, Arthur Andersen had about 26,000 US employees. Even though the conviction was later overturned,[42] Arthur Andersen had only about 200 employees left by then.[43]

To mitigate these negative unintended consequences of corporate criminal prosecutions, the DOJ tends to offer corporations a settlement agreement in lieu of prosecution. DOJ prosecutors have broad discretion when determining if a corporation should be charged with a crime. Factors used to in this determination include:

1. "*the pervasiveness of wrongdoing within the corporation, including the complicity in, or condonation of, the wrongdoing by corporate management*";

2. "*the corporation's timely and voluntary disclosure of wrongdoing and its willingness to cooperate in the investigation of its agents*"; and

3. "*the corporation's remedial actions, including any efforts … to replace responsible management, to discipline or terminate wrongdoers,… and to cooperate with the relevant government agencies*". [44]

Under these guidelines, a corporation facing a criminal investigation can reduce the risk of criminal liability for the corporation by reporting the criminal acts of its employees to "relevant government agencies". Hence, corporations have a strong incentive to report criminal behavior of employees even if the corporation encouraged and benefited from that criminal behavior. This is true even if the corporation benefited from, and encouraged, the criminal behavior. The phenomena of a criminal employer offering evidence against a participating employee in exchange for leniency has been called *reverse whistle-blowing.*[45]

One of the problems with studying the phenomenon of reverse whistle-blowing is that no corporation would admit to investigating and reporting criminal employee behavior to avoid prosecution for corporate criminal behavior. Hence, only circumstantial evidence can be used to identify cases of reverse whistle-blowing. In Boeing's case the circumstantial evidence of reverse whistle-blowing is clear. Boeing reached an agreement with the DOJ because Boeing "fully cooperat[ed] with the government's investigation" of the employees and paid $615 million in fines.[46]

Applications of These Case Studies to the NSPE Code of Ethics

Engineering codes of ethics can be applied to the cases of Erskine, Branch and Siemaszko to illustrate how following these codes can help protect engineers from legal as well as ethical problems. The following discussion references the National Society of Professional Engineers (NSPE) Code of Ethics for Engineers.[47]

Erskine & Branch: Clearly, Erskine and Branch's behavior was unethical. Erskine violated the NSPE Fundamental Cannon #4 which admonishes engineers to: "*[a]ct for each employer or client as faithful agents or trustees".* Erskine was unfaithful to his (former) employer when he took proprietary information from Lockheed to Boeing. Branch and Erskine violated Cannon #5 which states that engineers should *"[a]void deceptive acts*". Hence, both Branch and Erskine could have avoided criminal convictions by adhering to engineering ethics.

Siemaszko: The situation with Siemaszko is much more nuanced. Siemaszko may have been one of the more conscientious engineers in a corporation with serious ethical, legal, and managerial problems. In hind-sight, Siemaszko probably should have objected more forcefully when FENOC prevented him from completing the cleaning of the reactor head in 2000. Failure to act in such a situation is covered by Section II (1) (a) of the NSPE Code of Ethics:

"If engineers' judgment is overruled under circumstances that endanger life or property, they shall notify their employer or client and such other authority as may be appropriate."

It may have been appropriate for Siemaszko to inform the NRC of this lapse as early as 2000. However, such a move would likely come at a cost to his career at FENOC.

Further, Siemaszko should not have allowed his work to be misrepresented to the NRC by FENOC. If he knew that his managers were misrepresenting his work, then Section II (1) (d) of the NSPE code likely would apply:

"Engineers shall not permit the use of their name or associate in business ventures with any person or firm that they believe is engaged in fraudulent or dishonest enterprise."

However, this would be a difficult stance to take. Invoking this section of the NSPE code would be tantamount to alleging that FENCO was engaged in fraudulent behavior. Again, this would likely come at a cost to his career at FENOC.

Regardless, in both case studies, conscientious application of the NSPE Code of Ethics would likely have prevented each of these engineers from criminal sanctions. Engineering ethical standards are not just 'nice ideas' for an 'ideal world'. Rather, adherence to engineering ethics standards can substantially reduce the likelihood of criminal sanctions for engineers who are pressured by employers to commit crimes.

Conclusions

This paper presented two recent cases where engineers worked for corporations with significant ethical problems. In each case these engineers were fired for alleged wrongful conduct. Each of these engineers filed wrongful-termination lawsuits against their former corporate employers claiming whistle-blower status. These lawsuits created strong incentives for their former employers to publicize evidence of wrong-doing on the part of the engineers. This evidence was later used by federal prosecutors in criminal investigations of those engineers.

Lessons Relevant to Engineering Ethics Education

- Sometimes ethical engineers will discover that they are employed by an unethical, even a criminal, employer. When this happens, the ethical engineer will need to be especially vigilant to insure that (s)he does not partake in the unethical or criminal aspect of that employment situation.

- In some cases, blowing-the-whistle may be a conscientious activity for an employee. However, whistle-blowing and filing a wrongful-termination lawsuit are not equivalent. A whistle-blower lawsuit may result in harmful publication of evidence of wrong-doing by that employee.

- If an employee is encouraged to commit a crime by a corporate employer, that employee should not expect to be protected from prosecutors by that employer. Rather, federal guidelines give corporations strong incentives to shift the blame to employees.

Acknowledgement

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