

CAESAR FOUNDRIES INDUSTRIES INCORPORATED (CFII)

It was late in the day on August 14, 2009 when Derek Micheli, the Foundry Manager returned to work wondering how they were going to deal with this one. He had just returned from the funeral of Jackson White and had to face the sobbing hysterics of Jackson's grieving young widow Cathy, while her new born baby lay sleeping peacefully in her carriage. As he looked out on the foundry floor, yellow tape surrounded the area around the furnaces where the fatality had happened, and the place was crawling with inspectors from the Ministry of Labour, and the local police. Production was temporarily shut down while the investigation continued. Not long ago a Quebec company was charged under Bill C-45, and Micheli had a sinking feeling that Caesar Foundries Industries (CFII) was about to face their worse legal challenge due to this unfortunate and unforeseen fatal accident. There were rumours flying around that the fine for the company could be upwards of \$1,000,000 and that he, the CEO, the GM and some of the supervisors and managers could face personal fines and jail time if criminal charges are laid. How could this have happened? What could they have done differently to ensure that this didn't happen again?

COMPANY AND INDUSTRY BACKGROUND

Caesar Foundries Industries Incorporated

Caesar Foundries Industries Incorporated (CFII) is a cast-iron foundry which manufactures and supplies iron pipes used to produce ductile iron pipes for the transportation of domestic water, fire hydrants, and products for the water and wastewater industries (See Appendix 1 for some examples of products). In 1985, John Caesar inherited a 20,000 sq. ft. foundry from his father Donato Caesar, which had been built in 1960. In 1988 Caesar sunk another \$15M to expand the foundry to its current size of 42,000 sq. ft. Although new equipment was purchased at that time, there has been not been any equipment upgrades made since then, as it has served its purpose over the years. The operation runs 24 hours a day, with three eight-hour shifts, five days a week.

CFII is located in the town of Sundial, 300 miles North East of North Bay, Ontario. Sundial is basically a rural town with a population of 1,500 people. The foundry employs 200 people with an annual payroll of \$15 million, and annual sales of \$80 million. There are 140 workers in production, 40 in administration, and 20 in senior management. (*See Appendix A for a partial organizational chart*).

With the closest major center 300 miles away, hiring workers proves to be difficult due to its proximity to an available workforce and lack of amenities afforded in a major centre. The average age of the town is 66, and finding young people to work in the

foundry can be difficult. However, not much hiring has been done in a long time, as the workers tend not to leave because most have grown up in Sundial, and have family ties to the community. Those who do leave CFII are usually attributed to retiring, or have died. The average age of the worker is 54 years old, and average work tenure is 32 years. Most of the younger workers possess a high school degree, while the older workers have not necessarily completed high school. There are some supervisors and managers who have moved up the ranks who do not have post secondary education, but have been with the foundry for a number of years, and therefore have a lot of industry experience. The education exception rests with some senior management and foundry supervisors who mostly possess university degrees in engineering or accounting. Several years ago the plant needed to hire 50 new workers due to growth and this resulted in some younger workers being hired to work in production and administration. Rather than expand the building a third shift was added at that time. The workforce is generally very well knowledgeable of their industry due to their long tenure.

The existence of the foundry in Sundial contributes immensely to the local and nearby urban centre's economies, with \$22 million of local purchases of material and services, payments of \$3.2 million a year on utilities, and property tax revenue in excess of \$122,000 per year. In fact the other major employers in Sundial besides the foundry are municipal government and the utility companies (gas, heat, water).

Wages and benefits are slightly above average for all employees. The company offers an ample amount of overtime to further increase base pay. In the early days of the foundry Donato Caesar had some company homes built for executives to rent at reasonable rates. In the past few years CFII have been selling off these properties to the managers who have been living in those homes at rates far below the market. CFII is no longer interested in having to worry about the upkeep of these homes and so are no longer offering this type of housing to managers. There are company dorms available for rent to the single male workers, and for those who work overtime and too tired to go home in the country, they can stay in the dorm at a very reasonable rate. In the past, having these dorms has helped with recruitment. Summer employment is offered to the children of the workers who are planning on attending college or university. Three annual scholarships are also offered to these same kids and is a popular program.

Managers are provided with annual bonuses equaling 100 percent of their salary if they can demonstrate an effort to keep costs down and efficiencies high. This is quite a motivator for this group. The workers are also paid bonuses, but not in the range of management's rewards. At times the workers are upset that they don't receive as much as the managers, but they are generally pretty happy just to receive anything. These bonuses are usually paid out just before Christmas and so for a short time any concerns about the perceived uneven bonuses is ignored for a few months.

The work week is 40 hours, with three shifts being offered, five days a week: days, afternoons and midnights. Workers are required to work their shift for two weeks, and

then they rotate through from days to midnights. There are only a few workers who work steady days, and it is based on seniority, or for those working on light duty if they are on workers compensation and working towards getting back to their full-time duties. Workers get 30 minutes unpaid lunch period each day as well as two 15 minute breaks, which workers may or may not take. It all depends on what orders need to go out and their deadlines. They are entitled to two weeks vacation for service between 1-5 years, three weeks for service 6-10 years, and 4 weeks vacation for service over 10 years.

There have been several attempts to unionize, but those have been thwarted. It is a constant concern that unionization could happen, but with its remote operations, and above average base pay and benefits, there is generally a belief that it will not actually ever happen.

Foundry Process

A foundry is a factory that produces metal castings that are close to the final product shape, from either ferrous (eg. iron, steel) or nonferrous alloys (eg. tin, zinc, silver, gold, titanium, nickel, copper and many other metals utilized primarily for metal plating). Metals are turned into parts by melting the metal into a liquid, pouring the metal into a mould, and then removing the mould material or casting. CFII offers a complete range of ductile iron pipe and fittings, valve and hydrant products, along with other products for the water and wastewater industries (*See Appendix B for examples of some products*).

Castings are produced by pouring molten metal into moulds, with cores used to create hollow internal sections. After the metal has cooled sufficiently, the casting is separate from the mould and undergoes cleaning and finishing techniques as appropriate. The production process involves a number of steps as shown in *Appendix C*.

Production Process

Pattern making

Patterns provide the exterior (mould) or interior (core) shape of the finished casting and are produced in wood, metal or resin for use in sand mould and core making. Patterns are usually made in two halves. CFII uses sand moulds.

Sand mould and core making

Sand casting is the most common production technique, especially for ferrous castings. Sand is mixed with clay and water or with chemical binders and then packed or rammed around the pattern to form a mould half. The two halves are joined together to make the mould - a rigid cavity that provides the required shape for the casting, as shown in *Appendix D*. Cores are produced by investing sand into a core box. The finished cores, which can be solid or hollow, are inserted into the mould to provide the

internal cavities of the casting before the mould halves are joined. Sand cores are also widely used in die-casting (such as CFII) where permanent metal moulds are employed.

Casting and Separation

Molten metal is poured into moulds using various types of ladles, or in high volume production, automated pouring furnaces. CFII's furnace ladles are older and are not automated. The molten metal is maintained at a set temperature in the furnace over 3600 degrees Celsius.

CFII uses a cupola furnace. A cupola furnace has several unique characteristics which are responsible for its widespread use as a melting unit for cast iron which includes high melt rates, low operating costs, ease of operation, and is one of the only methods of melting which is continuous in its operation. Newer foundries are opting for electric furnaces, but the managers at CFII feel that replacing furnaces is not cost effective at this time. The common fuel source for cupolas is coke with limestone acting as a flux. Air can be pumped in to increase the burning of the coke. When the coke is hot enough the alloy is introduced in the top of the cupola. Some will place the alloy then fresh coke and then more alloy. (*See Appendix E for example of a Cupola*).

Metal is poured into the "runner" (a channel into the mould cavity) until the runner bush is full. The molten metal that is poured into the mold will begin to cool and solidify once it enters the cavity. When the entire cavity is filled and the molten metal solidifies, the final shape of the casting is formed. The mould cannot be opened until the cooling time has elapsed. The desired cooling time can be estimated based upon the wall thickness of the casting and the temperature of the metal. The "riser" provides an additional reservoir of feed metal to counteract the shrinkage that occurs as the casting begins to cool. (*See Appendix F for pouring of molten metal*). When the metal has cooled sufficiently for the casting to hold its shape, it is separated from the mould by mechanical or manual methods. With sand moulds the process is often referred to as shakeout or knockout, and large amounts of dust may be generated resulting in exposure to silica.

In the casting clean-up area of the foundry, workers typically use tools, such as shovels to remove slag and other materials from the casting machines. Each shift a worker cleans out a section of the casting clean-up area of the foundry known as the "bull ladle pit." The bull ladle pit is a dirt excavation measuring approximately 10 feet in diameter and 7 feet deep. The bull ladle pit contains lime (whose chemical name is calcium oxide) which is added to a machine known as the "U-ladle" or "bubbler" to de-sulfurize the melted iron (*See Appendix F*). During the bubbling and pouring of melted iron, lime falls from the U-ladle and onto the floor of the bull ladle pit. After the material is sprayed with water to cool it down, a worker then enters the pit to clean the hot hardened iron and lime from the area. The worker climbs into the pit and uses a pick, bar, and sledge hammer to loosen the hardened lime in the pit, and a shovel and broom to transfer excess lime from the pit to a bin. Employees enter the bull ladle pit to remove spilled debris typically during the third shift each work day, but depending on

production levels could occur during other shifts as well. While working the bull ladle pit shoveling/sweeping debris, the employee is exposed to the hazard of having his unexposed skin come into contact with hot metal, which could cause thermal burns and the lime, which could cause chemical burns. To avoid this contact, employees are provided with personal protective equipment such as heat/chemical resistant coveralls, gloves and non-prescription. Employees are required to supply their own steel toed shoes, hard hats and their own prescription safety glasses.

Removal of runners and risers

After casting, these extraneous pieces of metal are removed and often collected for re-melting. In ferrous castings and larger non-ferrous castings, they may be removed by knocking off, sawing or cutting using an arc air or oxy-propane torch. In die-castings, they are often snapped off manually.

Finishing

A range of finishing processes is usually undertaken. These include:

- cleaning to remove residual sand, oxides and surface scale, often by shot or tumble blasting;
- heat treatment, including annealing, tempering, normalizing and quenching (in water or oil) to
- enhance mechanical properties;
- removal of excess metal or surface blemishes, (e.g., flash resulting from incomplete mould
- closure or burrs left from riser cut-off), by grinding, sawing or arc air (oxy-propane cutting);
- rectification of defects by welding;
- machining;
- non destructive testing to check for defects;
- priming, painting or application of a rust preventative coating.

Sand recovery and reclamation

The industry recycles a large proportion of mould and core making sand internally for re-use. This involves processing to remove tramp metal and returns the sand to a condition that enables it to be used again for mould or core production.

THE INDUSTRY

The industry for iron foundries (ferrous metal foundries) falls under the national classification system of 331511. CFII is considered to be one of the largest employers in terms of number of employees in the industry (*see Appendix G*). Growth in this industry is increasing by 3.2% per year having grown from 73 in 1998 to 100 in 2008. Over the past year the industry has declined by -7.4%. Iron foundries main customers are automotive, which has seen great decline over the past year.

The Iron Foundry industry is made up of production and administrative employees. The number of production employees in the Iron Foundries national industry decreased from 5,878 workers in 1998 to 2,619 in 2007, or at a rate of -7.8% per year on average, representing a decrease of -27.4% in the last year. The number of administrative employees in the Iron Foundries national industry decreased from 1,046 workers in 1998 to 492 in 2007, or at an average of -7.3% per year, representing a decrease of -24.1% in the last year. CFII has been doing relatively well, most likely because the industries that it serves have not been affected by the recession. Many foundries cater to the automotive industry, unlike CFII who sell to other more recession proof industries.

The average annual compensation for employees of the Iron Foundries national industry rose from \$45,534 in 1998 to \$47,757 in 2007, or at 0.5% per year. There was a decrease of -9.1% over 2006-2007. The average annual wages for production workers in the Iron Foundries national industry grew by 0.4% over the 1998-2007 time period, and decreased by -10.0% over the course of the latest year. The annual salaries and wages of administrative employees increased by 0.6% on average between 1998 and 2007 and decreased by -6.7% between 2006 and 2007. CFII's annual compensation is \$48,500 per year, and has increased by an average of 3.2% per year from 2006 to 2008.

The cost of energy, water and vehicle fuel increased from \$59.1 million in 1998 to \$70.3 million in 2007, or at an average rate of 1.8% per year. Over the course of the most recent year, a -11.7% decrease was observed. Since CFII is in a rural setting, these costs have increased by 4.0% per year.

Total revenues in the Iron Foundries national industry have decreased from \$1.2 billion in 1998 to \$819.3 million in 2007 or by -3.4% per year on average. In the latest year the growth rate was -12.7%. Net revenues in the Iron Foundries national industry have did not change significantly, increasing from \$382.8 million in 1998 to \$-29.3 million in 2007 or by 0.0% per year on average. In the latest year the growth rate was -55.7%. CFII has seen their revenues increase by \$350k per year for four years from 2003-2007, but this year's projections are expected to drop by about \$100k. Customers have been starting to demand lower prices. (See Appendix H).

THE WORKERS AND THE INCIDENT

Derek Micheli, Foundry Manager

Derek, a professional engineer, has been with CFII for 29 years. He has managed to work his way up, having worked during his university days in the foundry, and then joining as the day shift supervisor. Known for his no nonsense management style, he is feared by many. Derek constantly faces a lot of pressure to ensure that production levels are always high, and that production runs efficiently. To do this he has to run a very tight operation, often finding ways to cut corners. The industry as a whole has not been doing well and there is fear that competitors that once dominated the automotive

industry are going to start infiltrating on CFII's domain. The message has been sent down from the CEO that there cannot be any waste, and the quality of production must be superior, at a cost that will be appealing to the customer, and to the bottom line.

There are several ways that money is saved. One of those ways is to keep recruitment costs down by relying on overtime. Derek feels that the extra money motivates his workers. In fact, the workers can earn up to an extra 20 percent every year on top of their base pay. Although some workers have approached Derek and asked him to hire a few more people, he feels this is the best for everyone. Even though the workers would like to turn down some of the overtime because they are not spending enough time at home, and they are tired, the workers are afraid of Derek so they don't say too much. So the supervisors just pencil in overtime and no one says much. Even the supervisors choose not to challenge Derek much, fearing repercussions from his actions. To make matters worse, employees generally get only minimal warning that they have to work overtime, and so the workers just take for granted that their 40 hour work week is really going to be an average of 56 to 60 hours per week. Even though there is a five day work week, they often have to work on Saturdays and sometimes on Sundays.

Another way that Derek keeps costs down is to make the workers buy some of their own personal protective equipment (PPE) such as safety boots, a hard hat, and prescription safety glasses. There are some pieces of PPE that must be purchased such as protective gear to protect those working around the furnaces with molten metal, but again it is imperative that costs be kept to a minimum and so buying in bulk can often reduce costs in the long run. In fact, suppliers in China are proving to be helpful.

John Caesar, CEO

John Caesar, an engineer, took over the family business in 1985 and sunk \$15M to upgrade and expand the foundry, which was completed in 1988. Having worked in the foundry during his university days, John decided to return home to take-over the family business when his father Donato decided to retire. Previously a farming community, the younger people were leaving for larger cities, thus leaving no one to take over the family farms. The only other real employment opportunity was either working for the municipality, utility companies or the foundry. John was one of those young people who had thought about leaving the small town, but after being away for some time decided he needed to go back to his roots. So when the opportunity arose for him to take over the family business he was happy to be given the chance to grow the foundry. By keeping the foundry going and expanding its operations, John felt it could revitalize the area, and perhaps provide further employment for many of his friends and family.

Prior to the upgrade, the operation only employed about 75 people, but with the upgrade in 1988, another 60 people were hired, and in the past few years another 50 were hired, when a third shift was added to the foundry operations. In the beginning,

John took on many duties including working in production while supervising staff, and managing the operations. After 6 months he had to hire another 15 people, mostly in administration to help because the demand was growing for his products.

John is known for his Jekyll and Hyde personality. On the one hand he is very compassionate when it comes to family matters. And then on the other hand he can be heard shouting out orders and pushing for more production. Most of the managers avoid Caesar whenever they can. Donato, his father, was regarded as a kind hearted, soft spoken man. When Donato was in charge everyone felt that they were part of an extended family. Donato would often hold luncheons at the workplace for all the workers. His wife Sophia would cook for hours and was happy to see everyone enjoy her food. Birthdays were always celebrated with a cake and a song. Since John has taken over, the lunches, cakes and songs have waned.

Donald McPhee, General Manager

With over 32 years experience at the foundry, McPhee is also known as a hardnosed, autocratic manager, focused on the bottom line. He accepts no excuses for below average performance or results. Managers and supervisors are expected to trim the fat. He is particularly concerned that WSIB are constantly increasing their rates and that they have been snooping around. Earlier in the month, McPhee had learned that the WSIB rates were going up by 2.0% next year, from \$3.97/100 to \$4.05/100. “How come we hire a H&S Manager, and the rates go up? What’s going on here?” There had been a few deaths a few years back, and yes there had been some burns when workers didn’t wear the right protective equipment when working near the furnaces, some slips and falls, and some respiratory problems, but not that much was happening lately? What a waste of resources he thought. It’s a dangerous place to work, and accidents are going to happen.

McPhee would often say, “thank goodness we are so far away from Toronto, because it is just too far for those worker compensation people and the Ministry of Labour (MOL) inspectors to be here all the time.” He has had several discussions with HR about strategies to get rid of them, but he wants low cost solutions. Unfortunately, low cost solutions are not always available.

One of the orders that had been handed down most recently from the MOL was a need for a \$200,000 ventilation system. With the potential for exposure to sulfur dioxide and carbon monoxide, the MOL felt this was absolutely essential. McPhee had not yet gotten around to ordering this ventilation system as he had a few more months, but he was busy sourcing alternatives and would make his decision by September, before the time period had elapsed.

On one of their previous visits a year earlier, the MOL inspectors had hinted that CFII really needed a H&S professional in order to get the accident rates down. McPhee was absolutely enraged that they would even suggest this. But the more he thought about it, the more he was convinced that if he spent the money and hired a H&S

professional, that this might stop them from interfering so much with their operations. He felt that the number of accidents was not all that bad, considering their type of industry but he would do anything to get them off his back. So he advised Sam Schmidt, the HR Manager to hire a H&S professional. Harvey Johnson was hired at the beginning of the year.

Harvey Johnson, H&S Manager

Harvey is one of the newer workers hired about 8 months ago. Several years ago WSIB claims were extremely high due to the deaths and accidents previously discussed. Harvey is new to health and safety and is currently working on his CHSP designation (Certified Health and Safety Professional). He has worked in the industry for five years in production, so he is familiar with the operations and the type of injuries that can occur.

Harvey is working closely with the company nurse to bring in programs that will help to reduce the accidents. He has been reviewing the training programs, PPE program, accident rates, WSIB claims, and the turnover that has resulted from deaths of employees. In fact, five employees have died since 1984 from what may be referred to as natural causes. There were also two fatalities in the 80's due to severe burns from the molten metal. Three of those employees with natural causes had died of lung cancer, and two others from heart and stroke related incidents. Research has shown an increased incidence of lung cancer related to breathing in large quantities of silica, a type of sand used in the process of making the moulds. Harvey wondered if there was a connection between the cases of cancer reported previously and this exposure? He had seen workers wearing PPE for the most part so he thought that failure to wear the PPE once in a while shouldn't be problematic. But he didn't have any concrete evidence whether it was a problem or not. Now there was the issue of WSIB investigating these incidents, so the matter was being highlighted. So far Harvey had not really put any programs in place as he was trying to get all his facts straight and was still trying to learn his way around the politics.

Harvey is struggling because it appears to him that people really don't want him there. Both his boss Sam Schmidt, the HR Manager, and McPhee avoid Johnson at all costs. Meetings get cancelled at the last minute, and then when he is in a meeting, both take phone calls and then make excuses as to why the meeting has to be rescheduled. Nothing ever gets resolved. Harvey has been finding it difficult to get Sam to commit any resources, financial or otherwise. If McPhee speaks to Harvey it is to get WSIB and the MOL off the company's back. As McPhee puts it, "don't those guys know that foundry work is dangerous and that accidents are going to happen? Those guys are just wasting their time and mine".

Sam Schmidt, Human Resources Manager

Sam Schmidt had been the Human Resources Manager for the past five years. He had worked for CFII as an HR assistant for two years before being promoted to his management position. Sam is also working on his professional designation as a CHRP (Certified Human Resources Professional) and possesses a college diploma in administrative support. Since he has started, he has implemented an orientation program to all new employees, although there are few new employees hired so he has not had to worry about it too much. Before Sam was hired new employees filled out paperwork and then met with a buddy to learn how to do the job. Now training in WHMIS and back care has been added. Employees get to watch a couple of videos to help reinforce this training. It adds about two hours of time, in addition to the two hours it takes to complete the company forms and learn about the basic rules and benefits in place. Considering that orientation is now four hours instead of two hours, Sam thinks this is excellent for the new employees. Over the past two years only four new employees have been hired.

One of those new hires had been Harvey Johnson, the Health and Safety Manager. Sam doubts the necessity of having this person onboard and reluctantly hired him. Sam still can't understand why the H&S duties had been taken from him as he thought he was doing a good job. Really there wasn't much to do, so hiring another person was a waste of resources. If it hadn't been for the MOL hinting that a H&S professional be hired, then Harvey would not have been hired. Even though Sam understands that the MOL couldn't order such a hire, the fact that they had hinted at it seemed like an order just the same. Sam agrees with McPhee's philosophy on the foundry being a place where accidents are not going to be avoided. It's a dangerous place, and employees know the risks when they take a job like this. But to satisfy McPhee, he reluctantly hired Harvey. To date Harvey hasn't really contributed anything at all.

Frank Hopkins, Plant Supervisor

Frank Hopkins, Plant Supervisor has worked for CFII for 19 years. Like all the other managers he rules with an iron fist, insisting on a lot of overtime to make sure he is in compliance with the wishes of his bosses. Managing this way is not something he is very comfortable with, but if he doesn't conform to the style of management being carried out at CFII he is afraid he will lose his job. Since recruitment of staff can sometimes be difficult due to the remoteness of the foundry, and the average age of the people in the town, he feels he has to use his existing staff. Besides, why wouldn't the workers want to earn extra income? He would? So why wouldn't they?

Frank knows that the rate of accidents has been consistently high at the foundry, but it isn't that much different than other foundries. It doesn't seem to matter what shift either - day or night – its all the same. Sometimes the guys don't wear their PPE, but it isn't all the time. If he sees someone not wearing it he reminds them to put it on. "You can't watch them all the time they are adults. They can decide what's best for themselves".

Susan Donnelly, Nurse

For the past 12 years, and in compliance with WSIB, Susan Donnelly had worked as the Industrial Nurse. She had seen her share of accidents throughout the years from small cuts, suspicions about lung cancer, excessive burns, and two previous fatalities a decade ago. For years she had wanted to do more, but resources for these things were limited and she was told to just stick to her nursing and patch up those who needed help, and then get them back to work as quickly as she could.

About nine years earlier, just a year after the fatalities, Susan had wanted to begin baseline medicals to squelch her suspicions about employees who had died from cancer, but John Caesar said that it was far too expensive for something that wasn't true anyways. Another initiative she wanted to incorporate was a connection with one of the local clinics to conduct pre-employment medicals. Again, Caesar argued that this was a waste of money and to stop bothering him with this. He warned her that if she kept up with these ridiculous ideas that perhaps she should just go work in the clinic. He gave her 24 hours to let him know her decisions – do her job without question, or leave? As a single mother this left Susan vulnerable and not in any position to put her job at risk. Fortunately she has been keeping track of some basic statistics as required by WSIB. (*See Appendix I*).

The statistics indicate that accidents are increasing, particularly in the casting area. This is the area where most of the accidents have been occurring since the beginning of the foundry and where fatalities have occurred in the past.

Susan had hoped with the new H&S Manager, Harvey Johnson, there would be changes but to date nothing seems to have happened. She and Harvey have had numerous discussions about things that could be done to reduce the accidents, and potential fatalities, but so far she hasn't seen any changes. Harvey confided in Susan that he wasn't sure what his role was and that it didn't seem like anyone really wanted him there. Susan knows exactly how Harvey feels because she has faced the same kind of roadblocks when she initially approached John Caesar. Susan is hopeful that there will be more MOL and WSIB interventions imposed on the foundry to ensure the health and safety of the workers. A day doesn't go by that she isn't busy completing Form 7's and it is obvious to her that something is wrong. Susan is also puzzled by the hire of Harvey. As the nurse there is so much that she can do. She has so many good ideas, but without support it is difficult. So in the long run they are wasting their money by hiring another worker, particularly when they have nothing to show for it.

Mary Donnelly, Production

Mary has been with CFII for 16 years. She is among very few women employed at the foundry, with only 10 women working in production. Mary's husband had died several years before. He too had been employed at CFII, and had passed away from lung cancer. The company wanted to help Mary out and offered her job so that she could provide for her three children. Mary is a strong woman and although the work is

physically challenging, she adapted quite easily and is able to pull her own weight. She is known as the voice of reason and often takes the young ones under her wing. Working overtime poses a bit of a problem for Mary since she is on her own with her children. Although one of the children is a teenager, Mary is not entirely happy leaving them alone with the older child. She finds it difficult balancing, but is also happy to have extra income to help with her finances. Mary really needs her job and doesn't feel complaining is worth it. Mary is one of the lucky ones because she gets to work on the day shift because she is a single caregiver, and because her husband had died while on the job, she doesn't have any daycare in the evenings.

Mary was happy when Jackson White was hired. She thought he was a nice fellow, and with his young family, she was happy to see him being able to care for his family. It had been a while since anyone new was hired, and so she was happy with the new hire because she was hopeful that some of the overtime could be cut back. But lately she has been wondering about Jackson's longevity at the foundry because he doesn't seem to be adapting very well, and she can see some problems brewing.

Jackson White

Jackson White was the newest member of production, having only been there for two months. Jackson did go through the new company training program and had been paired up with Neil Dobson as his buddy. Of course, Mary Donnelly also helped where she could. Knowing that the job had three shifts, and is in the foundry industry, Jackson was not too happy about taking this job. Armed with a business degree, Jackson was not able to find anything that could pay enough to support his new family. With a new six month old baby daughter, and a wife who was not working, Jackson had to take a job where he could provide for his family. Jackson's wife Cathy was from Sundial. They had met at the University of Toronto and Cathy convinced Jackson that living in Sundial would be great. It was a beautiful place, and she was really homesick. Her father knew the GM well, and Cathy knew he could get Jackson a job at the foundry. He thought that if he could get his foot in the door that perhaps he could try and move into the office at some later point. So reluctantly Jackson took the job to keep everyone happy.

Jackson started working in the production area, in the casting area. His task was to remove slag and other materials from the casting machines, as well as shoveling and sweeping in the bull ladle pit. Some personal protective equipment (PPE) was supplied. For example, Kevlar clothing which is heat resistant (jackets, gloves and leggings) and face shields were supplied and employees were told that they were to wear all the PPE when the furnaces were operating, and molten metal was being poured, and it was to be kept on when the molten metal had cooled off. The Kevlar covered all exposed skin so that the worker wouldn't be burned. In addition, the workers were to provide their own safety shoes. Jackson found that the clothing didn't necessarily fit well, and that every time he went to find the right gear, all the necessary pieces of clothing were not always there and he had to make do. It appeared that there wasn't enough clothing available. Even if he did find clothing, it didn't always fit

very well, and it didn't seem very sanitary as anyone and everyone wore the same clothing. He wanted to ask the supervisors for help when he couldn't find the right pieces of clothing that fit, but he couldn't always find the supervisors, and he had been told explicitly by them that he was not to leave his work area without their express permission.

Besides the poor fitting PPE, night shifts were proving to be difficult because his new baby, Angelina, just didn't sleep much, and so neither did Jackson. With the hottest summer on record, Jackson was having a difficult time tolerating the heat at work. To make matters worse, his third floor apartment did not have air conditioning, contributing to always feeling drained.

Jackson was also starting to resent the job because he felt overqualified and didn't understand why they had to work so fast. It was so dirty and dusty. And to make hours worse, his co-worker, Neil Dobson, who was assigned to train him had stopped helping him out. In fact the other workers were giving him a hard time, and working at the foundry was not much fun. Without any help from the other guys or support from the supervisors Jackson knew he was making mistakes, but figured that the guys were sabotaging him anyways, and that it wasn't his fault. He was going to have to go to the GM about the matter very soon and planned set up an appointment on August 18, 2009 when the GM was expected back in the office from holidays.

Neil Dobson, Production

Neil has been employed for over 19 years and is known as a very knowledgeable and easy going person. Asked by his supervisor if he would mind working with the new guy Jackson, Neil said he would be happy to help out.

Working with Jackson proved somewhat difficult for Neil because Jackson was having trouble keeping up. The heat from the casting process seemed to drain the energy out of Jackson, causing him to work slowly. Neil was concerned that the bosses would get upset with him because their shift was starting to show signs of falling below expected targets. The other workers were also wondering why the company had hired Jackson because he didn't seem to be pulling his weight and they thought it was very unfair. Neil started to feel that perhaps Jackson thought he was better than everyone else, but then he wondered if maybe Jackson was related to someone in upper management? If he said something bad about Jackson to the bosses, maybe his own job would be in jeopardy so he thought he better keep his mouth shut. Getting another good paying job in the town would not be easy, and so workers knew they couldn't say a lot or else they could find themselves on the unemployment line. On the other hand, Neil didn't want to look bad, and so he started picking up the slack for Jackson.

On the midnight shift, August 5, 2009 Neil finally had enough and decided to speak to Jackson about his attitude on the job. Neil had thought about it all day and had his speech all planned out. He would speak to him calmly and try to turn Jackson around, but by the time Neil met with Jackson he started yelling at him because he was so

frustrated. "I'm getting tired of carrying the load for you. You don't care about me, your co-workers or this company". Jackson was surprised but taken off guard yelled back, "you're a loser. There is no way I'll stick around a hell hole like this for too long. I know a lot of people and you are not going to get away with this". The two got into a scuffle but it ended soon after the other workers saw what was going on and pulled them apart. It ended with the two shaking hands, but communication between the two was not the same, and Neil decided to stop helping Jackson. Jackson was now left to his devices to learn the job.

The Fatality

The following week, word had travelled throughout the foundry about Neil and Jackson's fight. Neil a long time employee and someone referred to as a great guy, was gaining sympathy from everyone in the plant. As a result everyone started shunning Jackson. Jackson felt like he was living in hell. No one would talk to him, no one would help him, and he felt very isolated. Word had reverberated back to the supervisors and some of the managers but the consensus was not to get involved and let Neil and Jackson work it out on their own. No one had made a direct complaint to them and so they didn't feel they should intervene. What they didn't know was that no one was training Jackson any longer. Training in the casting area needed a good three solid months before a worker really understood what they were doing safely.

The weekend had been extremely hot, with temperatures in Sundial recorded over 40 degrees Celsius and Jackson felt even more drained than the weeks before. He also had not been sleeping well because of the heat, his crying daughter, and his dissatisfaction at work. Jackson was counting the days when he could bring his problems to the GM, McPhee, but in the meantime he knew he had to suck it up in front of the others and pretend that all was well.

The shift started off in the usual manner with everyone looking for PPE. Again there were pieces missing and all he could salvage was a Kevlar jacket, cloth gloves, and a face shield. He was wearing his steel toed shoes and a hard hat. The guys were all doing their job in the casting area. Some were cleaning the castings, others were clearing the castings in the bull ladle it, and then others were moving the molten metal. It was especially hot that day, as temperatures climbed to 42 degrees Celsius. With the pouring of molten metal, the temperatures in the foundry were about 10 degrees hotter. About one hour into the shift, a group of the guys decided to take a break, including Neil Dobson. With it being so hot, they decided to rotate guys around so that everyone could get a rest, but production could keep going and no one could get upset. No one approached Jackson so he didn't even realize that most of his crew had gone on a break until he turned around and found himself alone. Upset by this shunning, he decided to keep working and would go for a break soon. He was shoveling in the bull ladle pit but after about 10 minutes the heat was really getting to him when he collapsed into the bull ladle pit.

One of the crews pouring the molten metal in the ladles had just come back from their break and noted that no one was around so that they could start pouring again. As the workers poured the molten metal and began to tip the ladle Jackson started to stand up when he noticed the molten metal come down pouring down towards him. It was at this time that the crew was returning from their break, when Neil noticed Jackson rising from the ground and the molten metal coming down over Jackson. Time stood still as Neil started yelling at Jackson, and then at the guys pouring the molten metal to stop, but it was too late. A blood curdling sound came out of Jackson's mouth for about 30 seconds or so, and then it was over. Everyone just stood in disbelief for what seemed like a long time, and then someone went running to find a supervisor and another person to get the nurse.

Moments Later

Donnelly arrived at the scene moments later, followed by Caesar, Micheli and Hopkins. Everyone was shocked by what they saw. There was nothing to be done and everyone stood dazed and in shock. Jackson's burnt body lay motionless on the floor. Donnelly turned to Hopkins and ordered him to call an ambulance, the police, fire department, and the ministry immediately. She then turned to Caesar and ordered him to get the employees out of the building.

Word had spread quickly throughout the building that a fatality had just occurred. Rumours started running through the plant saying that Neil Dobson had been killed, but shortly after everyone knew it was Jackson. The employees all gathered outside and just sat stunned. Some of those who had witnessed the fatality were physically ill, others were just in shock and couldn't speak. The employees just sat and waited for hours. Small groups were gathering and everyone was chatting about what had happened. By that time, the entire town was aware of the fatality at the foundry, the place was crawling with media, government officials, and families of the employees showing up to see what was going on. After about three hours the employees just started going home without anyone having spoken to them.

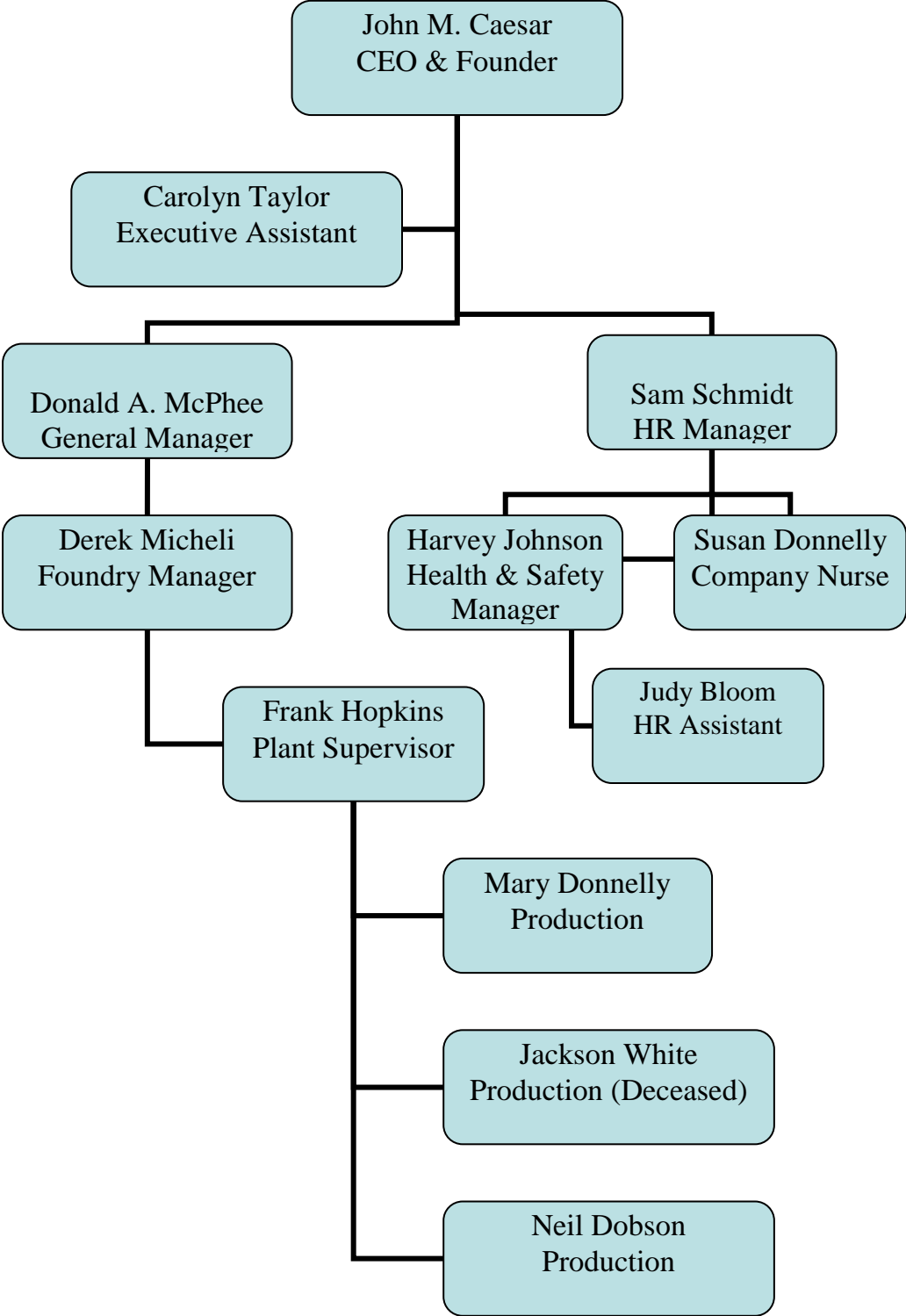
Later That Evening

By the evening, the Ministry had finally arrived from North Bay and immediately went to speak to Caesar and the other managers. They asked to speak to the health and safety committee and the Health and Safety Manager to find out what they had to report, as well as what the employees who witnessed the fatality had to say. Caesar, still in shock, said that the committee and the Manager had not done anything and that all the employees had returned home by now. He turned to look at the other managers, but everyone just looked down at the ground in silence.

Questions

1. What are the underlying problems at CFII?
2. What could have been done to prevent this problem?
3. Can they afford not to make changes? Why or why not?
4. Is it reasonable to expect that a foundry will have more accidents and fatalities compared to any other industry? If so, what should be done about this?

APPENDIX A: CAESAR FOUNDRIES INDUSTRIES INCORPORATED (CFII) PARTIAL ORGANIZATIONAL CHART



This fictitious case was written for MINERVA Canada by Dr. Deborah Zinni, Brock University.

APPENDIX B: EXAMPLES OF CASTINGS PREPARED FOR CUSTOMERS

Ductile Iron Pipe



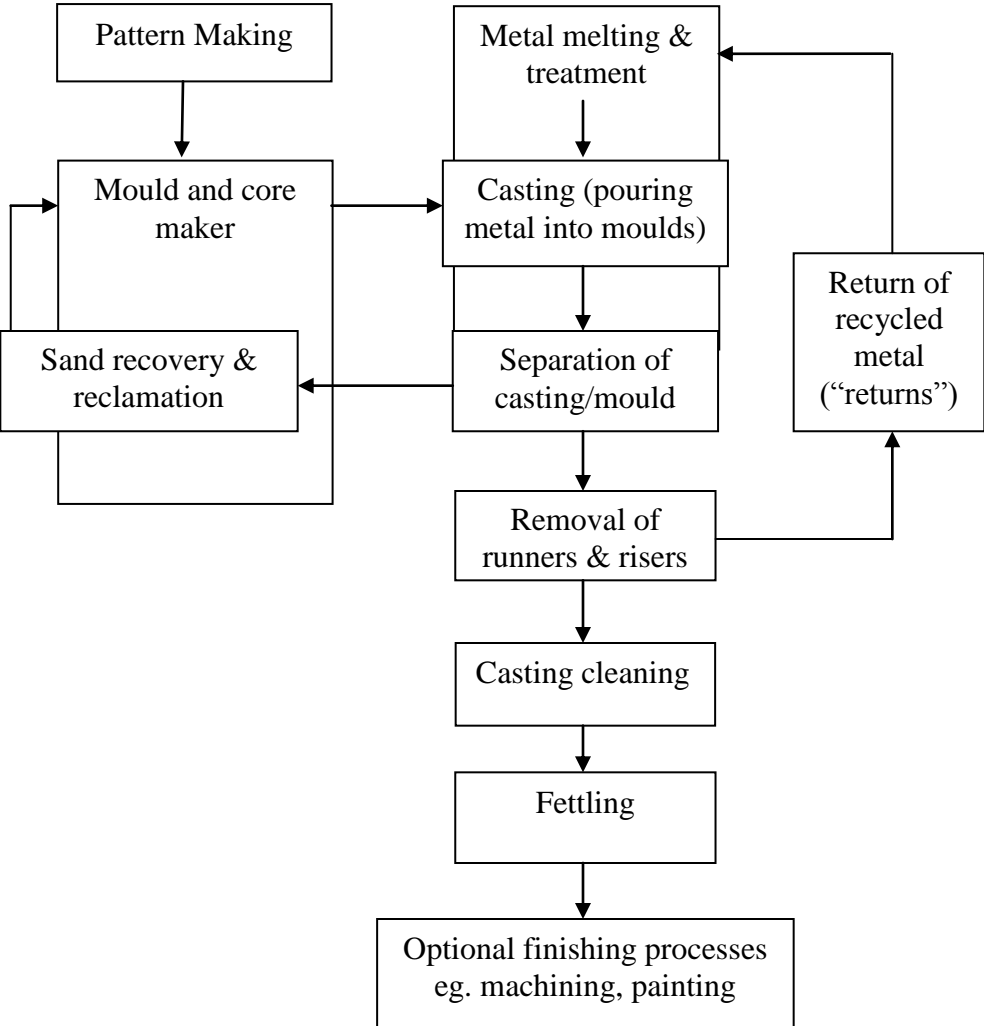
Plug Valves



Fire Hydrant



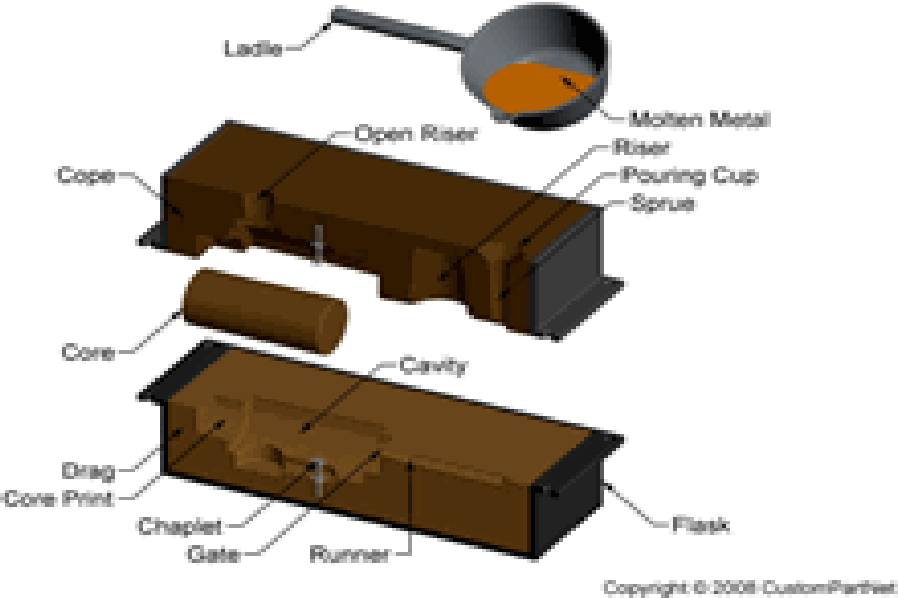
APPENDIX C: FOUNDRY PROCESS



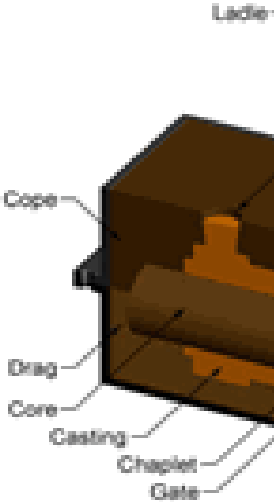
This fictitious case was written for MINERVA Canada by Dr. Deborah Zinni, Brock University.

APPENDIX D: SAND MOULD AND CORE MAKING

Sand Mould Opened



Sand Mould Closed



APPENDIX E: CUPOLA FURANCE



APPENDIX F: Example of Process of Pouring Castings



**APPENDIX G: Number of Employer Establishments in Canada By
Employment Size Category and Region: December 2008
Iron Foundries (NAICS 331511)**

Province or Territory	Employment Size Category (Number of employees)			
	Micro 1-4	Small 5-99	Medium 100-499	Large 500+
Source: Statistics Canada, Canadian Business Patterns Database, December 2008.				
Alberta	2	1	1	0
British Columbia	3	7	1	0
Manitoba	1	0	3	0
New Brunswick	0	0	0	0
Newfoundland and Labrador	0	0	0	0
Northwest Territories	0	0	0	0
Nova Scotia	1	0	0	0
Nunavut	0	0	0	0
Ontario	1	26	2	0
Prince Edward Island	0	0	0	0
Quebec	6	16	3	0
Saskatchewan	0	0	0	0
Yukon Territory	0	0	0	0
CANADA	14	50	10	0
Percent Distribution	18.9%	67.6%	13.5%	0.0%

In 2008, the breakdown of employer establishments in the Iron Foundries national industry was as follows: 18.9% of them were considered *micro*, employing less than five employees. *Small* establishments accounted for 67.6% and *medium-sized* establishments accounted for an additional 13.5% of the total number of establishments. *Large* employers, those with more than five hundred persons on payroll, accounted for 0.0% of the total establishments in the Iron Foundries national industry.

APPENDIX H: TOTAL REVENUE: 1998-2007*
 MANUFACTURING VS. NON-MANUFACTURING ACTIVITY
 IRON FOUNDRIES (NAICS 331511)

Type of Output	Value in \$ millions		% of Total 2007	CAGR** 1998-2007	% Change 2006-2007
	1998	2007			
*Prior to 2004, data covers incorporated establishments with employees, primarily engaged in manufacturing and with sales of manufactured goods equal or greater than \$30,000.					
**Compound Annual Growth Rate.					
Source: Statistics Canada, special tabulation, unpublished data, Annual Survey of Manufactures, 1998 to 2003; Annual Survey of Manufactures and Logging, 2004 to 2007.					
Manufacturing Revenues	1074.6	669.2	81.7%	-4.6%	-14.2%
Other Revenues	86.1	150.1	18.3%	5.7%	-5.7%
Total Revenue	1160.7	819.3	100%	-3.4%	-12.7%

Total revenues in the Iron Foundries national industry have decreased from \$1.2 billion in 1998 to \$819.3 million in 2007 or by -3.4% per year on average. In the latest year the growth rate was -12.7%.

APPENDIX I: ACCIDENT STATISTICS

For the Period January 1 to June 30, 2008

	Last Year	Current Year	Change
Fatalities	0	0	-
Lost Time Accidents	15	24	+9
Medical Aids	70	72	+2
Light Duty	7	15	+8

Current Year as of June 30, 2008

Fatalities

No fatalities have been recorded in recent years. Two fatalities previously resulted from molten metal accidents where PPE was not worn.

Lost Time Accidents (off work more than 1 day)

- 2 lost time accidents resulted from tripping accidents in the casting area
- 12 lost time accidents resulted from severe burns in the casting area.
- 6 lost time accidents resulted from severe respiratory related issues in various departments
- 4 lost time accidents resulted from back-related accidents in shipping
- 1 lost time accident resulted from a cut finger resulting in stitches

Medical Aids

- 87.2% of medical aids are burns from the casting area
- 10.8% of medical aids are cuts from shipping, receiving and maintenance
- 2.0% of medical aids are strains from the office services

Light Duty

Light duty has been increasing. Workers on lost time are encouraged to come back on light duty as a transition back to their jobs full-time. The casting area is problematic.

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