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# ADAM BURKE AND PBM PLASTICS: MESSAGE IN A BOTTLE[1]

Between his responsibilities at his new job and trips to his old company, Adam Burke, former president of PBM Plastics, was scrambling. Only four months after selling his disposable preformed baby bottle liner business in August 2005, the buyers were unable to meet orders. Ordinarily, that might not be a former owner's problem—but his current company, PBM Products, had a supplier exclusivity contract with his former firm, which was now part of a company called SparPack.

Within weeks, PBM Products needed to ship SparPack product to retailers or default and incur hundreds of thousands of dollars in fines—not to mention let customers down. On top of that, pulling the contract from his former company could put the SparPack division out of business and all his former employees out of work. Given the scarcity of liner suppliers, Burke was in a bind—there was no one else who could meet the obligation. Was there something he could do to get his former company back on track in time? What should he do next?

## Disposable Baby Bottles

The traditional baby feeding bottle was made of reusable glass or plastic and required sterilization. In the 1980s, Playtex introduced the disposable bottle liner and eliminated the need for bottle sterilization; the new system also reduced the amount of air a baby ingested during feeding. Bottle liners became an industry standard, putting the Playtex brand left, right, and center in the baby product space.

In the system first introduced by Playtex, a flat plastic liner was stretched over the lip of a bottle cylinder and filled with milk. As the baby drank, the flat liner collapsed around the remaining milk until it had collapsed into a vacuum, preventing the intake of air through the

[1] Some names, dates, financial data, and examples are disguised, and some material is fictionalized for pedagogical reasons.

This field-based case was prepared by Gerry Yemen, Senior Researcher, and Elliott Weiss, Ethyl Corporation Professor of Business Administration. It was written as a basis for class discussion rather than to illustrate effective or ineffective handling of an administrative situation. 

nipple. The only downside to the system was that as the liner was filled, the weight of the milk could pull the liner off the bottle rim, spilling its contents. Playtex responded by developing a preformed, three-dimensional liner with a rim that functioned as a gasket, making its use easier and more secure.

With every good idea comes a competitor. PBM Products Company (PBM Products), a manufacturer of infant formula in Gordonsville, Virginia, noticed that no one was making a private-label preformed liner to compete with Playtex. It didn't want to enter the market, but it did want to get word of its brand to infant formula customers and figured distributing formula coupons through liner packaging (**Figure 1**) would serve as an effective marketing vehicle. So it contacted Adam Burke, an executive trained as an engineer who had worked at Procter & Gamble and GE in baby products and plastics, with an offer: PBM Products would be the main investor and make him an equity partner and president in the preformed liner business if he agreed to a distribution arrangement. For Burke, it would be an opportunity to own and run his own business.

Figure 1. Baby formula coupon.


Source: Adam Burke. Used with permission.

With seed money ready to go by 2000, Burke set out to produce Playtex-compatible preformed plastic baby bottle liners in Newport News, Virginia, a city about a two-hour drive east of Gordonsville. He leased the first factory, planning to find a suitable one to purchase later. Burke was confident no one else was going to be able to make a private-label product (see **Exhibit 1** for Burke's product).

**The Production Process**

Burke's patented technology[2] used a proprietary process—essentially a modification of *thermoforming* and *blow molding*[3]—called *melt-phase forming*, in which plastic was heated to an almost-molten state, then stretched and shaped by a plug and air. Discs were punched out of a thin sheet of plastic, heated, and pushed into a mold with a plug; air then formed the thin liner within the thick rim, similar to how a gum chewer blows a bubble by shaping the gum with the tongue, then blowing.

Buying the raw plastic sheeting turned out to be complicated. Only two suppliers in the world could produce the highly specialized "low-orientation" sheet plastic for Burke's operation: one in Newburyport, Massachusetts, and the other in Williamsburg, Virginia. Burke bought large rolls of plastic and housed six weeks' worth of it in the factory warehouse. The plastic sheet was fed into a cutting machine and was processed into round pieces of plastic called *billets*. Cutting the billets first, as opposed to using whole sheets, enabled about 30% better utilization of the rolls of plastic.

Once cut, billets were fed to the back of the production machine (**Exhibit 2**). The plant had three production machines: the 4000, which produced four-ounce liners for newborns; and the 5001 and 5002, which produced the eight-ounce liners that made up 80% of the market. The billets were fed into tubes and sorted onto trays in three rows of 10 liners (30 per tray) The trays, held in place by a mechanical press lock, ran through heaters that were positioned above and below; they raised the billets' temperature to 800ºF. On occasion, billets that got too hot would drop onto the bottom heater and would ignite if they weren't removed.

Once heated, billets were stretched and blown into a long, cylindrical vessel shape. Finished product came out the front of the production machine. Then the liners were tested for quality, stacked, and packaged. While packaging its product, the company put infant formula advertising in each box.

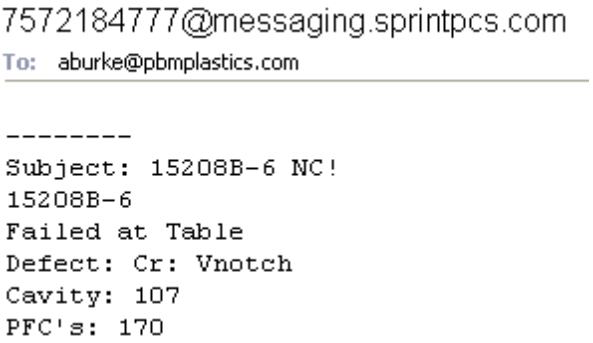
Each box of liners was then sealed and sent to a company called Sterygens for presterilization. Pallets of Burke's product were placed on a conveyor belt and sent into a lead-walled room containing advanced sterilization technology. As conveyers moved the pallets around the room, doors in the floor pulled away and a sterilization technology rose up to eradicate any kind of bacteria on the liners. "What it meant," Burke said, "was an extra level of guarantee for customers." From there, the liners were shipped to a warehouse that jointly delivered PBM Plastics bottle liners and PBM Products infant formula to stores.

[2] The first patent was granted in 1987; new patents were filed in 2002.

[3] *Thermoforming* was a horizontal process in which products were formed and cut out of stretched and heated sheets of plastic. *Blow molding* was a vertical process in which plastic was heated into a viscous liquid and poured into a mold that could close and open.

Burke's plant used an elaborate data collection web camera system that was completely integrated across the operation. Each machine had a PLC system[4] that, if temporarily down, would text the appropriate operator and let a supervisor know there was a problem (**Figure 2**). For example, it would notify mechanics of mechanical errors, quality supervisors of quality issues, or electricians of electrical drive problems. The machines knew what was wrong, and the cameras offered visuals of the problems. Daily output and throughput rate numbers were all automated via e-mail—it was very much a living system.

Figure 2. Sample PLC error message.




Source: Jamie Clark. Used with permission.

## The Business

When Burke started out in his new business, he recognized that plastic prices were not sustainable—he was paying $1.92/lb. Running his materials and cost of goods in his pro forma, he realized that plastic needed to be $0.85/lb. or he would be out of business. He needed to either negotiate a lower price or double his yield per pound of plastic. The first thing Burke did was look to improve his defect rate—which was over 25%, a troubling figure for Burke. It turned out that microscopic pin pricks were creating leaks around the bottom of the liners. Once that was fixed, the default rate decreased to less than 2%.

But Burke still needed to lower costs, so he contacted his plastic supplier and said he needed to lower the price to $0.92/lb. The Newburyport supplier said the lowest they could go was $1.85, and SparPack in Williamsburg said that based on prior history with the business it would never supply Burke. Burke recalled:[5]

[4] *PLC* stood for "programmable logical controller"; these usually connected to sensors and were used to control assembly line systems.

[5] This is a field-based case. All information and quotations, unless otherwise noted, derive from case writer interviews with company representatives.

> What do you do when a supplier won't supply you? Do you buy product that you can't afford or do you shut it down? What do you do? When I first talked to the team in Newburyport, they said, "We might be able to get you to $1.90, Adam." And I said, "Guys, we're going to be at $0.85 one year from today." I eventually got the price down to $1.35 a pound and this was in August. I said, "Guys, I'm going to be below $0.90." They said, "Adam, $1.35 is as low as we can possibly go"—so I'd been constantly driving cost reductions with them and then finally, one day I said, "Guys, would you be willing to lose the business at $0.85?" They said, "Absolutely." I called them two weeks later and told them they lost the business, and they said, "Well, we can go lower." I said, "I've made a one-year agreement. We can talk about dual sourcing in six months, but right now, you've lost the business." I had worked out an arrangement with SparPack.

Although there were a number of companies that made traditional baby bottles (among them Playtex, Munchkin Inc., and Johnson & Johnson), there was money to be made in the disposable liner market. But Burke was concerned that only Playtex was making the bottle for the disposable liners. "What kept me up at night was, they were selling the razors, and we were selling the store-brand razor blades," Burke said. "So if they changed the razor...as the story goes…changing the bottle was one of our biggest threats." In spite of Burke's concerns, PBM Plastics operated at a 30% margin.

The rapid switch from flat to preformed liners had placed extreme margin pressure on companies such as Evenflo, which produced flat liners. Because of the eroding financials and the prohibitive intellectual property on the technology to develop its own preformed liner, Evenflo executives had decided to get out of flat liners and bottles. Burke reached out to people he knew at Evenflo and negotiated a contract to source bottles from Evenflo's operation in Mexico City. Now, instead of building its own bottle-only molds, PBM had its own complete bottle—including body, tops, nipples, and rings—for less than $0.50, all sourced within about a month. "We didn't have to amortize any kind of molding costs, tooling costs, and we didn't really know if we needed that bottle long term or if Playtex had anything in the works to change," Burke said. "So this was a variable cost solution that allowed us to go quickly to market."

**Running Production**

As was common in manufacturing, equipment problems occurred from time to time. Many parts had long replacement lead times, so having spares was critical. One such part was the actuator that cycled trays through the machines. One Friday evening around 6:00 p.m., Burke was notified that an actuator had gone out and that they didn't have a spare. He explained:

> This actuator was a three-week-lead item, and I had been told by my maintenance manager, Tim, that we had critical spares on everything. I said, "You gave a monthly spare parts list, and on the list there's the needed actuator, and it shows we have a critical spare." He goes, "Yeah, but it's broken." I said, "Well, that's

> not a critical spare. That's a broken part." Tim says, "I really screwed up. I'm so sorry. The 5001's going to be down for three weeks." I said, "No, it's not." Tim flatly stated, "Yes, it is, this is the only part. Nobody else can make it. There's no way to get this fixed." I said, "We will have this up and running by noon tomorrow."

Burke set out to fix this critical problem as quickly as possible by embarking on three parallel paths, and was confident that at least one was sure to work out. First, he sought out a brilliant staff mechanic and asked him to take both the broken machine part and the broken spare part and try to create one working actuator. Second, he assigned a team to try to develop a more manual work-around. Third, Burke asked his sourcing people to contact the actuator supplier by whatever means necessary (the company had mobile and home numbers for all crucial suppliers) and find out what it would take to accelerate delivery of the part no later than the next day. If the supplier dragged its feet, sourcing was to get an inventory list of everyone the supplier had shipped an actuator to in the last six months and call them to see if PBM Plastics could buy out their inventory.

In the end, his mechanic and a machine company Burke had previously worked closely with figured out a way to get the combination of two broken actuators to work. The 5001 was up and running by 11:15 the next morning. And two people who had bought actuators in the last six months sold PBM Plastics their spares, which arrived the following Wednesday. Burke said:

> When you create a mission for people that this is what we're going to do—not ask them, "Can you do it?"—it changes the way people think because *no* isn't an answer to "How do we get it done?" Once they say no, from an ego and a pride perspective, you have to change their position and then get them to relook at the situation once they told you it can't be done. However, if you ask how to do something and help the team develop options and choices, what you offer is magic. The secret is that you must develop something that's aggressive enough to meet the needs of the business, but not so aggressive that you lose the confidence of the team by asking something completely impossible. I had three strategies and one of them needed to work—in this case, it was a combination of not accepting the machine shutting down for three weeks, asking "How do we get it done?", and providing suggestions to meet the end goal.

Another example of the type of manufacturing problems that required fresh thinking happened just as PBM Plastics was in the middle of a major inventory build for a big promotion. On a steamy August day, the factory air conditioner broke down. New air conditioning required a three-and-a-half week delivery time and a two-week service call for installation. With all three machines' heaters running, the temperature inside the factory was stifling. The manufacturing manager approached Burke and said, "It's too hot; we gotta shut down and send everybody home." Burke reminded him that they had customers depending on them. The maintenance manager came to talk to him, then the quality manager came, and finally the procurement manager said she was shutting down. "I kept telling them that we had customers who were

counting on us and we had to make it work," Burke said. If PBM Plastics failed to meet the contract date, it would not get another chance for that order for another year. Finally, one manager suggested they rent portable air conditioning units for $20,000 a day to pump in cold air. "That's not the only option, guys," Burke said. "I need you to come up with a balanced solution to keep us running—balance the needs of the people and the needs of the business. I'll give you a few hours." At the end of the day, the whole group came back to Burke, "like one big mob," and told him they were going to quit as a team if he didn't do the right thing for the people and shut down the plant. At that point, Burke told them he had a solution that would solve the problem quickly and easily. No one believed him. Burke recalled:

> I said, "If I solve this problem in 10 minutes for less than $100, will you promise me you won't ever bring me a problem without an elegant solution?" In my opinion, management means optimizing resources you have: cost, labor, resources, etc. Leadership gets results independent of the constraints. So one optimizes variables and constraints, the other delivers results in spite of the constraints, and that is what I consider delivering an elegant solution.
>
> I went to Food Lion, which is two minutes around the corner—and one of the things to understand is that our work force was mostly making minimum wage and had not previously been a part of high-performance, winning team. I loaded up a grocery cart with Häagen-Dazs ice cream, fruit bars, Klondike bars, and ice cream sandwiches—I think I spent around $48.00—and then I got a bunch of soda. I went through the back door of the plant and filled up the freezer in the break area. Then I gathered the management team and said, "Come with me." I pulled a meeting together with all the employees on the floor and said:
>
> "Guys, thank you so much for your hard work over the past day. I know it's brutally hot and exhausting and we're at a point where everybody has a choice to make. We have a customer that's betting on us and depending on us, and we need them also for the long-term survival of our business. If we don't deliver the product, we're going to let them down. So we have a choice, to keep the plant running with me and every other member of the senior team working right by your side until we get the air conditioner repaired or shut down the plant and fail our customer. If we keep running, nobody's going to be using air conditioning—in fact, the air conditioning is shut down in the offices. There's not going to be air conditioning in this entire building while we're working through this. We're all in this together, and I'm confident we can pull through as a team. We're doing everything we can to get it fixed. Until then, we are going to fill up the freezer and the refrigerator with ice cream, fruit bars, sodas, and you guys drink and eat as much as you want, as much as you need for free. As of now, everybody can go on breaks as often as they want, but we have to help each other, relieve each other."
>
> They took one look at the freezer and said, "We'll make it happen."

Two days later, the air conditioning was operational because the team was able to develop more options to bring it back on-line more quickly, the firm had not lost a single person, and the company had met its commitment to the customer. Indeed, once it was all over, Burke heard several people say, "We could have gone longer without the AC if we needed to. Can we still get the free ice cream and soda?"

**The Offer**

Around 2005, the price of plastic began to increase again. This time, when Burke went to SparPack to discuss plastic pricing, they also discussed a vertical integration option. After meeting with PBM Products, his affiliate, they worked out a deal to sell the PBM Plastics business to SparPack. Burke joined PBM Products a few months later as COO in the infant formula, foods and cereals, and baby bottle business. Terms of the sale to SparPack included a five-year supply agreement for preformed liners to PBM Products. As he left, Burke told the new owners to "do three things." The first was to keep the camera system going. He explained:

> I told them not to disable the living system that I had. "Keep it up and running. It's your missile defense system. If anything's going wrong, this system will tell you." What you find is in these very fast-paced businesses, you don't want to only leave it up to the people to escalate. Sometimes people don't want to tell you when there's a problem and you're not hitting goals until it's too late. So that was a crucial living network, a neural net that we had.

The second item was to be sure to have six weeks of inventory available. Although generally considered a large amount for a small company, it had an effect on production. Unrolling plastic from the rolled form somehow introduced oxygen, which accelerated the half-life of the slip agent coming to the surface. Anecdotally, Burke knew that if the plastic didn't age for six weeks, it became what they called "snotty plastic," which tended to get overheated, drop onto the bottom heater, and stick to the equipment.

The third recommendation was to take care of two highly valued individuals—an engineering manager and a maintenance manager who had been with Burke since the beginning and had designed some of the equipment. "Whatever you do, protect these guys, reward them, recognize them," Burke said. "Don't let them get lost in your organization, because these two guys alone can help with any problem you will ever run into." Indeed, Burke believed that reward was a powerful incentive for most employees; he had offered gift certificates to teams exceeding output goals (see **Exhibit 3** for output charts and the contest).

One month after he left, Burke got a call from one of the managers at SparPack, asking him to come help solve a problem. The hydraulic press that formed and stretched the liners had been down for three days. Burke went to Williamsburg, walked into the plant, greeted all his former employees, and asked them what was going on. Both of the highly valued individuals Burke had recommended to the new owners said, "Those guys think they know what they're

doing, so we're just letting them figure it out." Burke asked if they knew what was wrong and they confirmed they did. When asked why they weren't helping out, they repeated that their new employer didn't need their help. At that point, Burke gathered a few plant employees and said:

> "Guys, we've got an order that needs to go out. I really need you to go get this fixed. This is still a team; you've got to make this work." They said, "No problem," walked over to the machines and had them up and running 15 minutes later. SparPack's culture was hierarchical, versus when we owned it and were very team-based. I didn't have an org chart in my company for three years, and it wasn't a "*who* can prove they're better" culture, it was a "*how* do we take care of the customer" culture.

## No More Liners

The first indication of an issue that would have a huge effect on PBM Products came in the form of another phone call from SparPack—150 days after the sale. The caller told Burke that PBM Products wasn't buying the promised amount of liners specified in the sales agreement. Burke checked into the POs, saw they were ordering plenty, and got back to the caller. A couple weeks later, Burke got another call claiming that PBM Products orders were down another 20%. Burke told the caller to keep shipping; maybe it was a catch-up between the group processing the orders and manufacturing. Two weeks later, the plant manager called and asked Burke for a meeting. When he arrived at the plant, Burke sat in the board room with the CFO, the marketing manager, and the plant manager. They asked Burke what he was going to do about the problem (they were convinced it was a slowdown because PBM Products was ordering less). Trying to grasp the situation, Burke asked for their output numbers over the past eight weeks. As they called out the numbers, Burke wrote them on the board, and that was the first time it became clear to everyone what was happening (**Table 1**).

Table 1. PBM Plastics output numbers.

| Week | Orders | Production | Shipped |
|---|---|---|---|
| 1 | 45,000 | 48,000 | 45,000 |
| 2 | 47,000 | 47,000 | 47,000 |
| 3 | 49,000 | 32,000 | 25,000 |
| 4 | 47,000 | 28,000 | 24,000 |
| 5 | 46,000 | 23,000 | 21,000 |
| 6 | 50,000 | 18,000 | 15,000 |
| 7 | 48.000 | 18,000 | 14,000 |
| 8 | 47,000 | 12,000 | 10,000 |

Data source: Adam Burke. Data is disguised.

The production numbers meant that SparPack was never going to meet the demand that PBM Products needed to fulfill its retail buyers' orders—and Burke had signed a volume commitment exclusivity agreement with his former firm. In addition, he knew that once the

company defaulted on one product, retailers tended to jump to conclusions and would likely believe that the whole PBM Product business could be out of stock. Burke told them:

> We're likely to start getting massive fines and fees from retailers such as Wal-Mart, Target, Winn-Dixie, Kroger, you name it; they're all going to start penalizing us for missed shipments, and that's going to cost hundreds of thousands of dollars. We need to set the production process back up quickly and we must meet the demand to keep customers supplied.

As it turned out, failing to follow Burke's three recommendations had a huge impact on production. The IT department had shut down the camera and notification system because it didn't comply with company standards. For cost-saving reasons, SparPack had dropped its plastic roll inventory to two weeks, and it had moved Burke's two best employees under a maintenance manager who discounted their input. As a result, the plastic became "snotty," got jammed in the machines, and overheated. That error wasn't discovered until later because there was no monitoring system, so all the trays were damaged—it would take up to four weeks and tens of thousands of dollars to replace them. To make matters worse, the two employees who likely knew what was happening and might have been able to devise an alternative solution felt undervalued and were disengaged from the whole mess.

Despite SparPack claiming it could make up the shortfall quickly, Burke knew the system too well to be convinced of it. He was now in a situation where he had a volume commitment exclusivity agreement with a supplier who couldn't supply, and he had no options to source elsewhere. His former employees would all lose their jobs if he pulled the PBM Products contract. And in just a couple of weeks, the company he currently worked for would be shipping shortages and letting customers down. What now?

Exhibit 1

**ADAM BURKE AND PBM PLASTICS: MESSAGE IN A BOTTLE**

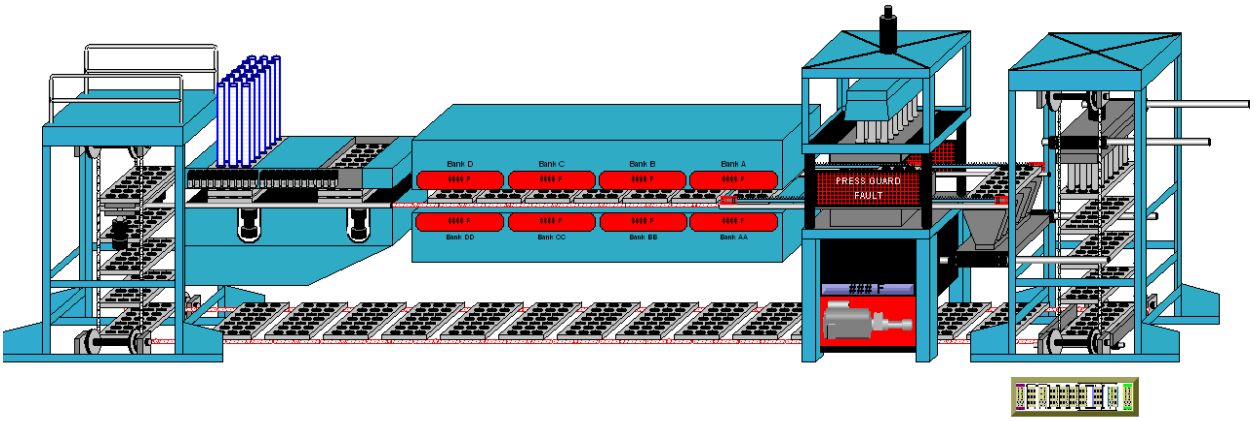
Disposable Feeding Bottle Liner


Source: Adam Burke. Used with permission.

Exhibit 2

**ADAM BURKE AND PBM PLASTICS: MESSAGE IN A BOTTLE**

Production Machine

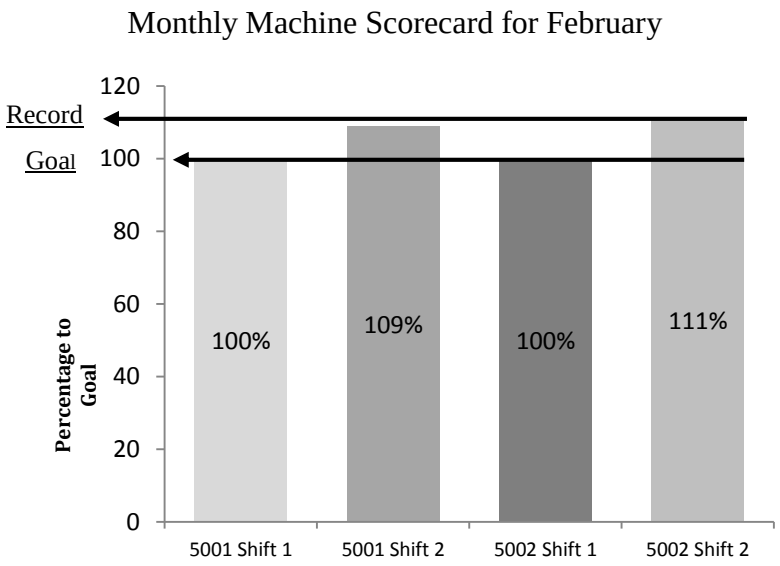



Source: Jamie Clark. Used with permission.

Exhibit 3

**ADAM BURKE AND PBM PLASTICS: MESSAGE IN A BOTTLE**

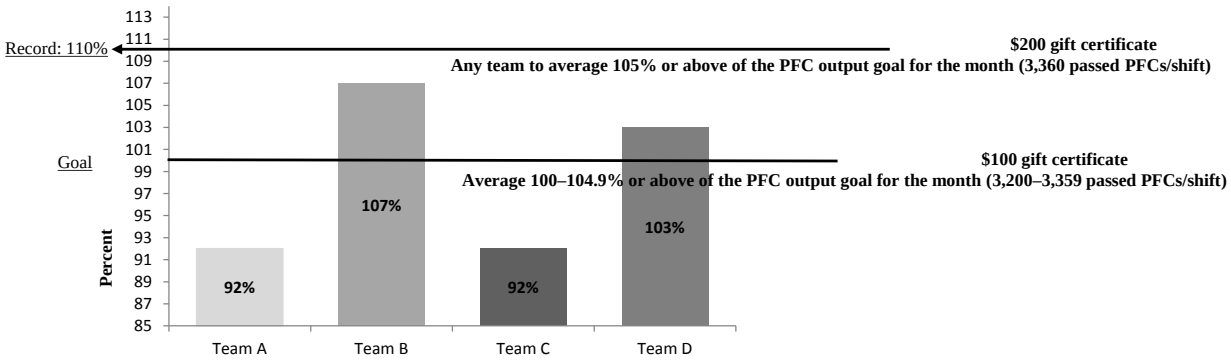
Output Charts




| Metric | 5001 Shift 1 | 5001 Shift 2 | 5002 Shift 1 | 5002 Shift 2 | Totals | Goals |
|---|---|---|---|---|---|---|
| Percentage PFC Output Goal | 100.3% | 109.20% | 99.60% | 110.8% | 105 | 100% |
| Uptime Percentage | 85.2% | 93.7% | 86.3% | 94.2% | 89.9% | 95% |
| Scheduled Downtime | 1006 min. | 0 min. | 1255 min. | 0 min. | 2261 min. | |
| PE Percentage | 79.3% | 86.3% | 80% | 88.5% | 84% | 90% |
| Percentage Loss | 6% | 7.4% | 6.3% | 5.7% | 6.3% | |
| Avg PFCs/Hour | 157 | 155 | 157 | 159 | 157 | 160 |
| LHU Percentage | 92.7% | 96.6% | 96.8% | 97.4% | 95.9% | 95% |
| Scrap Percentage | 2% | 2% | 2% | 3% | 2% | 5% |
| Total NC | 0 | 0 | 740 | 525 | 1265 | 0 |
| NC Percentage | 0% | 0% | 1.7% | 1.1% | 0.7% | 0% |
| **Percentage Detection** | 85% | 77% | 67% | 69% | 74% | 80% |
| Total Critical Defects | 554 | 216 | 477 | 295 | 1542 | 0 |
| Pass PFC | 43340 | 47158 | 43013 | 47875 | 181386 | |
| Calcuated Goal | 432000 | 43200 | 43200 | 43200 | 172800 | |
| Total PFCs Made | 43340 | 47158 | 43753 | 48400 | 182651 | |

Exhibit 3 (continued)

Operations Contest




Data source: Jamie Clark. Used with permission.