

All to Pieces

FROM SMALL ERRORS, BIG PROBLEMS GROW

BY TIMO J. SANTALA

After a month of setting up a casting facility on the other side of the country, Raul was happy to be back home—until he arrived at work and found a mess in the casting department. The trees from that morning’s cast had one problem after another: porosity, finning, flashing. He immediately sought out the company’s new casting manager—his old student, Richard.

Raul found him outside the wax burnout department, a stack of chart recordings in one hand and a frown on his face. “Richard!” he yelled. “What’s been going on here? The trees look horrible!”

“I know,” Richard said. “When you left, everything was casting fine, but now we’re getting nothing but bad results. I just can’t put my finger on the problem. I thought I could do it all on my own.”

Raul sighed. Obviously, his days as a teacher were not over; Richard would once again have to learn the hard way. “Let’s see what happened,” Raul said. “I want to start at the beginning and work with every line manager until we figure out the cause of this problem.”

They started in the wax department. “Richard,” Raul said, pointing to a recently sprued tree, “how do these waxes look to you?”

“They look pretty good—not perfect, but pretty good,” Richard hedged.

“You’re right. But look, there’s too much parting powder here, and the pieces are a little close together. Also, we should try to clean up the gate attachment to the tree by smoothing it a bit more. But you’re right, it is pretty good.”

They moved to the investment room. “How are we doing in here?” Raul asked.

“I think we’re under control,” Richard said. “The guys have been following the standard operating procedures all month and have noted any anomalies.”

“Good. I see only one minor thing,” Raul said. “Look at the rubber bases; some of them have a little buildup of wax. We should try and clean that up if we can. But you’re right again, we look pretty good here.”

Two areas down and no major problems had been found, but

Richard didn’t know whether to feel better or worse. After all, they still hadn’t found what had caused the horrible castings.

“All right, let’s go into the casting room,” Raul said.

Richard followed nervously as Raul made his inspection from one end of the room to the other. “Once again, not bad,” Raul commented. “I see a few things I’d change, but overall not bad.”

“What things would you adjust?” Richard asked.

“Well, a few pieces of scrap still had tiny amounts of investment on them, the buttons on some of the trees were too small, the caster moved one or two of the flasks a little too soon, and a few of the flasks seem to be seated imperfectly, but the vacuum was still good. Like I said, nothing major. Let’s look at breakout.”

Raul spent a few minutes in the breakout area before walking out. “Once again, everything looks decent,” he said.

“Well, what can it be then?” Richard asked, puzzled. “We’ve looked at every area. Something must be wrong.”

“Oh, there is,” Raul said. “Richard, things are out of control.”

“But... But... You said...!”

“I know what I said at each and every step. I said things looked all right, BUT... That ‘but’ is the problem. Casting is a series of steps, with each step dependent on the one before: Waxing, treeing, investing, burnout, and casting. If we have a 90 percent success rate at each step, at the end of the run, we get 60 percent of the castings without a problem. Now let’s say that half the time, one problem overlaps another, so that we have only one casting affected rather than two. If we overlap half, still only 80 percent of the castings come out good.”

“I see. So we need to tighten up the little things,” Richard said.

“That’s right. We can’t control casting 100 percent, but I bet if we take care of all these little things, tomorrow’s castings will look better than today’s. And it will be a lot easier for us to find problems in the future if we’re sure about all these details. Right, Richard?”

“Right, Raul. I’m glad to know I can always count on you. Speaking of details, let me show you some chart recordings...”

Raul shook his head. A mentor’s work is never done.