CASE STUDY 9.1: *Somebody's Got a Problem*

"I'll look into the problem right away and call you back before noon." John Wilson, customer service manager for Tweedle's Widgits, finished a high-stress conversation with Jim Johnson, QC manager for Dumm Industries. Dumm is one of Tweedle's newest customers who potentially could develop into one the highest volume purchasers of Tweedle's products. Johnson claims that the first shipment of parts from Tweedle fails to meet a number of dimensional specifications. This is not the way that Wilson wanted to start his day.

After informing the general manager of the problem, Wilson meets with Dee Barnes, QA manager for Tweedle's Widgits. "I don't understand it," Dee says. "We all knew how important this first shipment was. There are three critical dimensions on the RT-101 part that we make for Dumm: (1) Length of the tab (specification is 0.490 inches ±0.004); (2) Width of the tab (specification is 0.250 inches ±0.004); (3) Thickness of the tab (specification is 0.050 inches ±0.004). I had two of our best technicians inspect all three critical dimensions on every part in this first lot. We used micrometers with a precision of 0.001. Our records show that they all are within tolerance."

What actions would you recommend that Dee take in her investigation to determine the root cause of this problem?

EXERCISES AND ACTIVITIES

1. Purchase a bag of jellybeans. Locate two different types of measurement systems that can be used to determine the length of a jellybean (e.g., a micrometer, a caliper, or a ruler graduated at least in millimeters or 64ths of an inch). With the help of two friends, conduct gauge R&R studies of the two measurement systems. Measure the length of the jellybeans. Determine R&R for each measurement system. (Provide your raw data to the instructor who will provide the specification range you need to complete your gauge R&R study. (*Note*: The specification will vary depending upon the size of jelly bean selected for this exercise.) Discuss the results you obtained. Which is the better system? Explain.
2. Using members of the class as subjects, conduct a study of the precision of a set of bathroom scales. Select at least four subjects in various weight ranges and weigh each subject at least 10 times in random order. Does it appear that the precision of the scale varies by weight range?