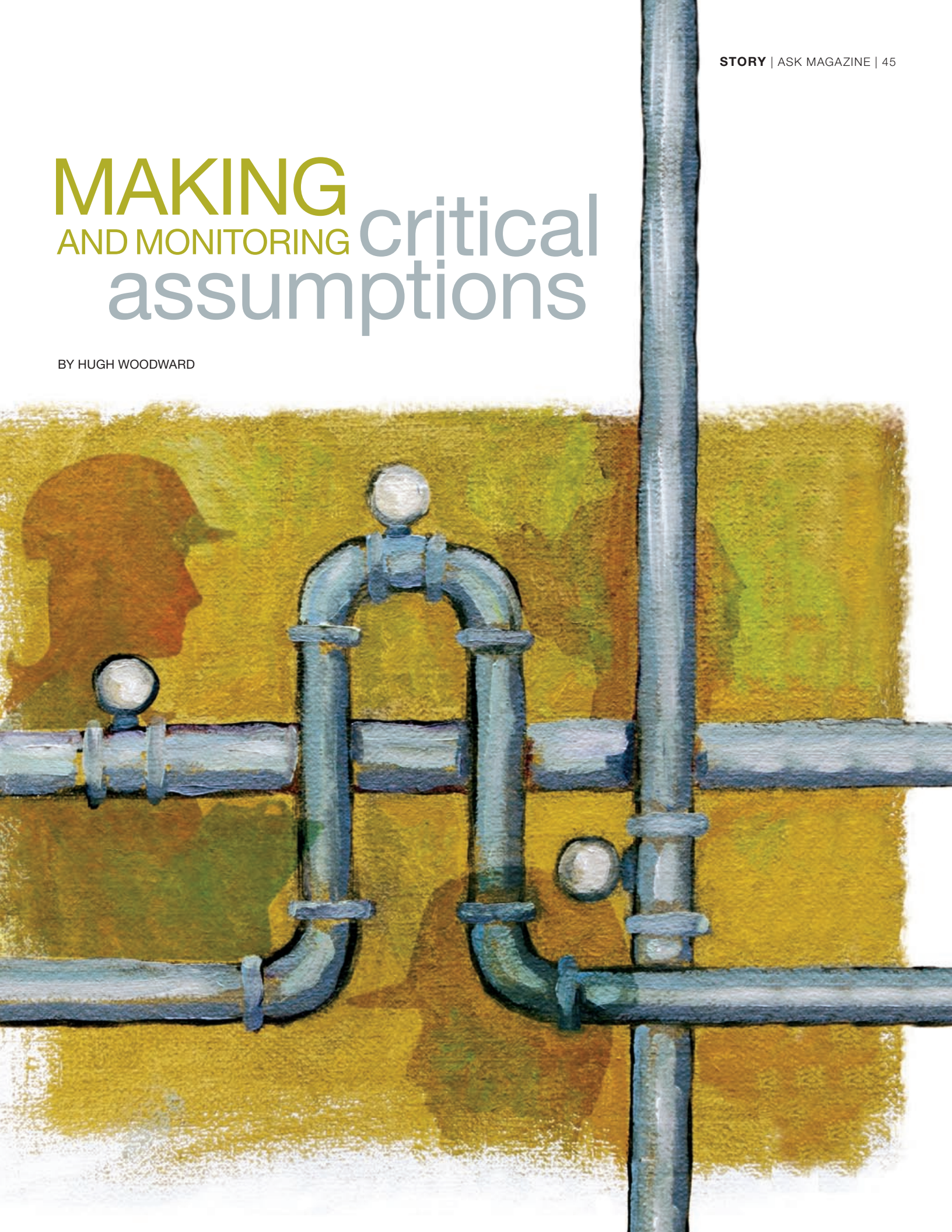
MAKING AND MONITORING critical assumptions

BY HUGH WOODWARD



I remember the day I walked into the paper plant in Oxnard under a brilliant southern California sun with a pleasant cooling breeze blowing off the Pacific. I was reveling in the opportunity to work on an interesting little project far from the wintry weather in Cincinnati, Ohio. An hour later, I was utterly depressed. I had just been given an impossible assignment.

The project had started a couple months earlier when the City of Oxnard demanded that the plant, which produced paper towels and toilet tissue, reduce its water consumption by 10 percent. A paper plant may be an easy target for politicians seeking to please an electorate, but our plant in Oxnard was already the most efficient of its kind in the world. Reducing consumption further was not going to be easy. Nevertheless, the company, sensing no room to negotiate, agreed to comply and appropriated funds to develop and install the necessary technology. Realizing the complexity of the task, they selected a project manager with years of experience in paper manufacturing: me!

Unbeknown to me and them, they had also selected a naïve project manager. I had no idea how difficult the assignment would be until I convened a project team meeting that sunny morning in Oxnard and asked a few routine questions.

"What is the scope?"

"Well, we are planning to re-use more waste water, reduce evaporation from our cooling towers, and install low-flow toilets."

"What?" I asked incredulously. "Low-flow toilets? They will save perhaps gallons a day. We are looking for over a hundred thousand gallons a day."

The team explained that the city had mandated low-flow toilets as part of the scope, presumably in an effort to be helpful.

I asked for details about the changes and soon learned they were all quite experimental. Even technology in use at other paper plants was not proven in our particular process. My anxiety increased when I started asking questions about current consumption.

"How much water are you consuming now?"

"We don't know."

"What do you mean 'you don't know?'"

"Well, we don't have meters on all our lines."

"But the city must know how much you are using. How will they know you have achieved the 10 percent reduction?"

"They won't!"

They explained that, because the plant treats its own water, it draws water from a trunk line upstream of the city's treatment facility. There was simply no provision for metering.

Resisting the temptation to suggest we do nothing and tell the city we had achieved the objective, I moved on to another subject that seemed important. I knew the plant was in the middle of a major expansion. In fact, they expected to more than double production within six months.

"How is the city thinking about that?" I asked.

"Well, we never discussed the expansion specifically, but we think they are expecting us to consume 10 percent less than what we would have done if we did nothing."

Finally, I asked about the water consumption in the orange juice facility. Several years earlier, the company had been looking to expand its production of orange juice on the West Coast and decided to site its manufacturing facility at Oxnard adjacent to its paper plant. Nobody knew. In fact, nobody on my project team knew anything about the orange juice operation, and they certainly had no idea how much water it consumed.

The immediate dilemma was how to get started. We clearly

had to install meters and establish a baseline. And there was nothing stopping us from installing those low-flow toilets. But what could we do beyond that? How were we to deal with all the unknowns? Every attempt to establish a project plan deteriorated into arguments about the expansion, the orange juice facility, and whether or not the new technologies we were planning to install would work.

We eventually decided the only way forward was to make some assumptions. We called them "critical assumptions." For example, we assumed the orange juice facility would make no contribution toward the 10 percent reduction. We also assumed the new production lines would consume the volume of water predicted by the design calculations. And we assumed the low-flow toilets would make no measurable contribution to our conservation target. We had no way of knowing if these assumptions were correct, of course, but they created boundaries that allowed us to establish a scope and eventually a project plan.

We knew we needed to check the validity of our critical assumptions periodically. We assigned project team members to each assumption and charged them with checking validity prior to each monthly team meeting and reporting their findings during the meeting.

With a logical framework now in place, we proceeded with execution. We installed meters on the incoming header and established a baseline that the city accepted. We also installed meters on every major line within the plant to measure consumption in each part of the facility. The only area that proved difficult to measure was the orange juice facility. As the team member responsible for metering explained, "The orange juice facility uses a lot of water when it runs. The problem is, it runs sporadically and not very often." Eventually, we acquired enough data to determine the average consumption of the facility was a little more than 100,000 gallons per day.

We also studied each of the conservation ideas and developed estimates of the amount of water they would save and the cost of installing them. Eventually, we had a menu of options that would give us some choices about how to achieve the mandated reduction within our budget. We even developed a list of contingencies should some of the conservation ideas deliver less than expected. Oh, and we installed those low-flow toilets!

Our project team meetings settled into a routine. Each began with a review of our critical assumptions. For the first few months, we found no reason to change them. We then reviewed each of the conservation ideas. As new information came to light, some dropped off the list. Others continued to look promising. We adjusted our scope accordingly. Overall, we remained cautiously optimistic.

Some nine months after my initial visit, I traveled back to Oxnard for a project team meeting I had no reason to suspect would be any different. After the usual preliminaries, we began our review of our critical assumptions.

"The new lines are now in production. They are not yet operating at target rate, but they appear to be consuming the amount of water we predicted. This assumption still seems to be valid."

"We have now converted all our restrooms to low-flow toilets. We have not seen any resulting change in total consumption. This assumption remains valid."

Eventually it was time for the team member monitoring the orange juice facility to report. "Please keep this confidential as it has not yet been announced, but the company has decided to exit the orange juice business. The production facility here will close in less than six months." Our jaws dropped. We immediately referred to the consumption data on our spreadsheets and saw that, incredibly, the impact would be just enough to achieve our target. All that remained was to close the project, report the reduction to the city, and return the unused funds to the company.

Not unexpectedly, some project team members disagreed. They argued the company had appropriated funds to install specific equipment and that we were obligated to install it. Others asserted we were obligated to achieve a 10 percent reduction beyond closing the orange juice facility. Some wanted to continue until the facility was in fact closed, in case the company changed its mind. But eventually we decided the project and the project team existed for one purpose only: to satisfy the city's mandate that the plant reduce its water consumption by 10 percent. That mandate had been fulfilled.

So we got a lucky break, but there is no doubt that our decision to establish and monitor critical assumptions was key to our success. Without these assumptions, we would likely have spent months arguing about issues we couldn't definitively understand early on, thereby failing to define a logical project plan. And without our monthly review of their validity, we might have wasted time and money pursuing flawed options. Without that careful monitoring, we would certainly have continued spending money on unnecessary technology for at least another six months, without realizing our job was done.

Fortunately, that was not the case. The plant achieved its water conservation target. The company got most of its money back. The project team learned a new approach to managing projects with high uncertainty. And I traded some dreary Midwest weather for southern California sunshine. All in all, it was a huge success! ●

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