Monsanto

FROM
(NAME-LOCATION-PHONE) K. S. Cahill G4WD (4) 7518

DATE: February 24, 1994

SUBJ: **Monsanto Magazine Article**
W.G. Krummrich -- Xylene

REF:

TO: R.F. Sackett
K.S. Miller

cc: C.B. Beckmann
L.J. O'Neill
L.W. Wassell

VIA FACSIMILE

Attached please find the Monsanto Magazine article on Krummrich's xylene emissions reductions. You may recall that the article required additional input from Keith Miller and other members of the plant environmental staff.

Something to consider -- When we prepared the Krummrich waste minimization kit we purposely stayed away from direct information on production increases coupled with pounds reduced for PDCB for competitive reasons. On page 5 of the attached article, a similar reference is used with regard to xylene. Your call, I simply wanted to bring it to your attention.

I have identified the following WGK personnel as having been quoted, and it would be helpful to have them review their quotes for accuracy:

Russ Kuttenkuler
Kurt Martin
Gene Mayer
Virgil Keller
Russ Sackett
Carrie Alspaw

The magazine's editor has requested comments by Friday, February 25. Your timely comments to me would be appreciated.

Action requested: Please review and approve the article.

K.S. Cahill

DSW 136051

Monsanto

FROM:
(NAME-LOCATION-PHONE) Kathy L. Heine (A2SP) 4-8525

DATE: February 23, 1994 CC:

SUBJ: Monsanto Magazine Article

REF:

TO: C. B. Beckmann - G4WA
K. S. Cahill - G4WF

Attached is the Monsanto Magazine story on Krummrich emissions reductions, which incorporates Keith Miller's suggestions. Please let me know if you have any comments by Friday, February 25. Thank you for your help.

Kathy Heine

Kathy Heine

/dh
Attachment

DSW 136052

Krummrich

by Art Hoffman

Teamwork helps Krummrich employees:

- reduce xylene air emissions by a million pounds
- increase production
- improve quality
- reduce costs

Employees at W. G. Krummrich clearly remember the announcement of the 90 percent program. "You almost could hear jaws dropping when Dick Mahoney said we'd cut emissions 90 percent," recalls one. "People were asking, 'How can they do this to us?'"

The problem was, the rubber chemical plant's 4NDPA department already had serious challenges. A benchmarking study of its primary competitor had revealed bad news. "We simply weren't competitive, and we had a lot of catching up to do," says Stephen Robinson, then manufacturing director for Rubber Chemicals, who is now director of corporate planning. There were other problems. The plant had gone through downsizing year after year. Peoples' heads were down. Also, there was a customer-versus-supplier mentality. "We really needed to look at ourselves in the mirror," Robinson says.

And with all that -- out of the blue -- came the 90 percent air emission reduction program.

Business unit leader Russ Kuttenkuler remembers the feeling in the plant. "We were behind the eight ball. We knew we were critical to meeting the corporate pledge, because we had reported 830,000 pounds of xylene air emissions in 1987." (Xylene, a volatile organic, is used as a solvent throughout the 4NDPA process. 4NDPA is an intermediate used in literally hundreds of rubber products, from tires to hoses.) "We'd never focused on recovering xylene," Kuttenkuler explains, "because it's relatively inexpensive. So we were pretty nervous. There was a lot of tension."

Tension increased, because it later was discovered that the 1987 xylene emission was understated -- by 300,000 pounds.

That setback put 4NDPA people "even deeper in the hole than we'd thought," says Kurt Martin, a process engineer who had come to Krummrich right after getting his chemical engineering degree that year. "The first week I walked in, everyone was saying that if we don't come through with xylene reduction, the whole corporate effort would fail. I thought, 'Great. That's what I really want to hear.' I wanted to do environmental work -- that's why I came to Monsanto -- but I had no idea of the scope of the job we had to do. It was a lot of pressure."

The pressure was shared throughout the unit. As mechanic Gene Meyer puts it, "We knew this couldn't be done overnight. And we knew no one person could do it. It would take lots of people sticking with it." That attitude was key to eventual success. Because literally dozens of people, from all levels,

would contribute in a variety of ways, large and small, to the successful reduction of xylene and, in a larger sense, Krummrich's turn-around.

Electrician Virgil Keller, who marks his 30th year at Krummrich this year, noted a clear turn-around in management approach -- and employee involvement. "It changed tremendously. In the 80s, management realized workers had good ideas and were capable of doing more than punching a time card and being told what to do until they punched it again. Management decided to take advantage of that, and people have really responded."

Changes in management approach took different forms. One was organizational. Each business was given responsibility for its own focus and its own dedicated people; unit autonomy was supported all the way up the line. "This allowed a real team feeling to develop," remembers production supervisor Larry Cunningham.

The creation of natural teams was further supported by unprecedented sharing of heretofore confidential information. "Management really opened up," Keller says. "We got information about our unit's financial picture, competitors' products, customer problems -- you name it. It used to be we'd read something in the paper about Monsanto and hear about it at the plant a month later. Now, any question you have, you get an answer."

Another highly visible change involved overseas travel. Formerly, only high-level managers traveled to Krummrich's sister

plants in Antwerp, Belgium, and Newport, Wales. But in the late 80s, that changed. Operators, mechanics and others now traveled overseas to inspect equipment and processes and develop relationships with their counterparts. "Before 1989 an operator wouldn't pick up a phone and call an operator in Antwerp about a problem. It just wasn't done," says Russ Sackett, who in 1989 was general manufacturing supervisor and now is plant manager. "Since then, we effectively started a worldwide technical exchange."

The same thinking was applied to Krummrich's customers. Instead of only managers visiting customers, all levels now toured customer sites to see how 4NDPA was used and learn how Krummrich improvements could help customers.

The result of these changes was "a trust relationship," says Cunningham. "Trust came out of sharing and the team feeling of the business unit."

Ideas on ways to reduce xylene emissions began to flow, many coming from weekly meetings of a Safety and Environmental Committee that included engineers, first line supervisors, operators and mechanics.

The complexity of the 4NDPA process -- and the ubiquitous presence of xylene throughout the process -- meant that no single "fix" would work. Many projects, taking years to design and implement, would be required for success.

Projects were prioritized in three tiers: reduce, recycle and treat. In the first tier, individual projects' results

ranged from 2,000 to 200,000 pounds in reductions. Taken together, these projects cut xylene by more than 600,000 pounds.

The second phase of projects -- recycle -- involved tying together vents and installing condensers to trap and recycle xylene for another 160,000 pound reduction. This phase actually made operators' jobs harder, but no one complained. "We had excellent cooperation," Kuttenkuler recalls.

After reducing and recycling as much xylene as possible, the team pursued the third phase -- treating destroyed xylene vapors by burning them in a thermal oxidizer. The oxidizer, installed in January 1993, was "a have-to-work" project, says process engineer Carrie Alspaw. "If it didn't work as well as it did, we couldn't have met the 1993 objective."

Underlying all three phases was another "have-to" -- tighter preventive maintenance on all equipment to prevent breaks or leaks. This is critical, because after all the various projects are accounted for, 100,000 pounds of xylene reduction "can only be attributed to improved maintenance and increased environmental awareness," Martin says.

Bottom line, Krummrich is a different plant today than it was in 1988. Krummrich people have reduced xylene emissions by more than one million pounds per year. They have increased production 40 percent, from 17 to 25 million pounds. They improved quality and were named one of the top four performance improvement projects at the Chemical Group's 1992 Conference of

Champions. They continue to bring down costs, with xylene-related savings alone a cool $400,000 per year. Cunningham says it best. "We've got a good thing going, and everyone's participating to keep it that way."

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