ESCO NEWS

OCCASIONAL NEWS AND INFORMATION FROM ESCO ENGINEERING

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ESCO Engineering, 179 Lansdowne Avenue, Kingsville, Ontario N9Y 3J2, Ph: (519) 733-3122; *Fax (519) 733-6094*

SURPRISE!

This is a true story.

About 18 months ago we were asked by the owners of a push-pull strip pickle line to visit the plant, and trouble-shoot the fume exhaust system. Fumes were escaping from the pickle tanks into the building, and the building fabric and equipment were deteriorating. The exhaust fan was noisy, and a maintenance headache.

After making some measurements and a survey of the ducting system, it was apparent that the main cause of the problem was a 'scrubber' that had been installed in the stack at the recommendation of another consultant. The exhaust system already had a perfectly satisfactory packed scrubber, so the addition of the scrubber in the stack did little to improve the HCl removal, but did cause a very high pressure drop. As a result, the rate of exhaust from the plant was reduced to about 1/3 of what was needed, and the fan was operating in the surge region, which accounted for the noise and high maintenance cost.

We recommended removal of the stack scrubber, and installation, in its place, of a low pressure drop demister; we also suggested some minor adjustments to duct sizes to improve exhaust in the rinse tank and at the last acid tank outlet.

A month or so ago we were invited to go back and evaluate the modified system – on arrival, we found;

- No leaks from the tanks into the building.
- Fan running quietly
- Exhaust flow rate increased by 3 times.
- No droplets coming out of the stack

exactly as predicted!

What surprised us was that the customer was surprised that our recommendations actually improved the situation.

Score 1 for Esco.

PUBLICATIONS

We have a number of publications that are yours for the asking, at no cost:

'The Whys and Hows of sulfuric acid pickling'

'The Whys and Hows of hydrochloric acid pickling'

'The Whys and Hows of pickle line fume scrubbers'

'The Whys and Hows of waste water treatment for picklers'.

You can request your copies by phone, fax or e-mail, but we need a postal address - these are printed documents, and cannot be e-mailed.

BUYING ENGINEERING #4

The Engineer - your partner

Your engineering consultant finds it very uncomfortable to be cast in the role of an adversary – we want to work with and for you, not against you. Of course, we have our own interests and agenda, but, in order to do our job effectively, these have to be over-ridden by the customers' interest and objectives. We must be prepared to give honest and objective answers to the technical and economic questions that arise, even if these answers are unpalatable, either to you or to us.

If you really want to get the best value from your engineering consultants, treat them as your partners, keep them informed about what is happening and, especially, be honest about time and cost requirements – remember, GIGO (garbage in, garbage out) applies just as much here, as it does to computers. Engineers can't provide good answers from bad input data.

This level of trust is a lot easier when working with an engineering company with which you are familiar – but what about the first project? For companies like ours, where our specialized knowledge is, for many customers, only needed for one project, or at long intervals, this is a constant challenge. The best answer is to talk to one or more of our many satisfied customers – they will tell you how we work, and how trustworthy we are. For the next project, we hope, you will be giving the reference!

Next time: Getting an engineering quote

DELETE THOSE DAMPERS!

Many pickle line exhaust systems are installed with dampers in the suction lines from the process tanks. These dampers are adjusted to balance the system on start-up, and are supposed to be left untouched for ever after.

A great idea, but doomed to failure, for the following reasons:

- Most exhaust system dampers are cheaply made without shaft seals or proper protection of the mechanism. As a result, they corrode and seize up in service.
- The exhaust air from the pickle tanks contains droplets of pickle acid, in addition to acid fumes. This pickle acid contains dissolved iron chloride (green crystals), which is deposited in the dampers, gradually plugging them up.
- The plant operators love to adjust valves and dampers, even if they are not supposed to – it's human nature!

The overall result is that the dampers soon get out of balance, or become immovable blockages in the exhaust ducts, which reduce tank ventilation, cannot be adjusted, and are a maintenance headache.

The best answer is to get rid of them (or, preferably, not install them in the first place). If the ducting is properly sized, the distribution of exhaust will be approximately correct, and few systems are so closely sized that some variation in exhaust rate from tank to tank will have adverse effects. If the ducting is not correctly sized, then it is cheap and easy to change the size of a few ducts to get the necessary balance, and a system that will work properly for ever.

THE VIEW FROM THE FIELD

Field Technician Fred Hasler pontificates on pursuing the Holy Grail in pickling

More often than not, when I am discussing pickling with supervisors and managers, I run into the same old questions:

What temperature is ideal? What pickling time is ideal? What acid strength is ideal? What coating is ideal? What rinsing is ideal? What in life is ideal?

Ideal---ideal---ideal--!!!! It gets to the point, where I shiver when I hear that word.

The answer is very simple: "There ain't nothin ideal!"

What I mean is, that there are so many variables in pickling, it is impossible to tie any one condition down to an exact figure. Every time you put some steel through the pickling system it is different from the time before: the temperature of the steel may be different, the scale composition may be different, the steel composition may be different, the acid concentration may be different, the inhibitor level may be different, the rinse water may be different, the operator may have had a bad day.

Just remember: Although there is exact science, to calculate exactly what is happening in pickling so that equipment can be sized and procedures can be set up, when it comes down to the practical application, it is the operators observations that determine the quality of the job.

It is dangerous to set exact parameters for the operator to follow because they do not always apply to the work being done. To get the best quality out of pickling, it is important for the operator, the supervisor and the manager to fully understand the basics in pickling so that they are capable of finding the best conditions.

You may think this all amounts to a lot of guess work---not so, if the supervisors and managers are fully EDUCATED in the finer details and the science of pickling. The trail to the Holy Grail in pickling becomes illuminated by education and knowledge.

Got a seminar?-----We do!

SPREADSHEETS

If you are looking for a design method, check out our collection of Excel spreadsheets, available for download from our Website (URL below). The sheets available include our very popular sheet for estimating emissions from open tanks.

At another location (chemengineer.about.com/ - the best chemical engineering resource on the Net) you can find a spreadsheet for designing and evaluating cyclones, created by our chief engineer, Neil Stone.

All these are completely free, and we are always happy to hear from users with any comments, suggestions or criticisms.

GOOD FOR A LAUGH