

ESCO NEWS

OCCASIONAL NEWS AND INFORMATION FROM ESCO ENGINEERING NO. 8, February 1995

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ON THE NET!

Yes, we're hooked up to the Internet, so you can e-mail anyone at Esco

using any of the following addresses:

pblokr@esco-engineering.ca

pas@esco-engineering.ca

jstone@esco-engineering.ca

Mail is usually checked all day,

You can also use fax or phone.

We're working on our home page - all being well, the next issue of Esco News, plus most Esco publications and software will be available for downloading. Our aim will be to make the Esco home page a valuable resource, rather than just a company ad - as with so many things, what you get out of the Net depends on what you put into it!

FUME EXHAUST TIPS #5

Scrubbers - Part 2

Fume scrubbers, like most equipment, don't always work properly. This time we discuss scrubber problems, and what to do about them.

First of all, you have to know whether the scrubber is working as designed. This means looking up the specs to determine the design flow, efficiency and pressure drop, and then measuring their actual values.

If the flow is low, and the pressure drop high, or both, this indicates plugging - this may result from scaling (see 'Scaling Factors' in Esco News #7), plugging with solids from the air stream, collapsed or deteriorated packing, or a plugged demister. A physical inspection of the scrubber interior is the only way to tell.

Low efficiency can only be established by measuring both the inlet and the outlet concentrations of the contaminant - an outlet measurement alone is not enough. The scrubber may have high discharge

concentrations, yet still working at design efficiency, if the process stream concentration is higher than anticipated!

Because a scrubber is essentially a device for contacting gas with liquid, most efficiency problems are the result of lack of contact, usually due to insufficient liquid flows (especially in packed scrubbers) or channelling of the liquid and gas. Typical causes of this are:

Circulating pump not working (don't assume it's pumping just because it's running).

Circulating lines plugged.

Packing too small (small packing needs higher liquid flows).

Plates not level (in plate scrubbers)

Plugged or broken openings in the liquid feed headers, giving uneven liquid supply.

Other causes of low efficiency are:

collapsed packing support - this reduces the amount of packing for contact between liquid and gas.

broken or buckled plates - too high a concentration of contaminant in the scrubbing liquid. This is not a problem when fresh water is used for scrubbing, but may happen as a result of attempts to re-use or recycle water.

Next time - 'Don't blame the scrubber'

FREEBIES!

Still available, *free of charge* from ESCO:

- "The Why's & How's of Sulfuric Acid Pickling".
- Neil Stone's AISE paper describing how plate type fume scrubbers work, and how they can benefit you
- our spreadsheet software for determining *open tank emissions*

Write or fax us for your free copies today!

SOFTWARE ACQUISITIONS

What would we do without computers? They may not always save time, but they do allow for more meticulous calculations, and evaluation of more options.

Amongst our recent software acquisitions:

Pipe stress analysis, with complete checking against all B31 codes.
Hydraulic network analysis
Duct network analysis

We also have a spreadsheet for pressure vessel calculations to ASME VIII Div 1.

An interesting development is the availability of affordable CFD (computational fluid dynamics) code for modelling fluid flow and many other physical and chemical systems, including heat transfer and chemical reactions. We are looking into this as another tool for process design.

We already have some fluid flow capability in our FEA software, but CFD appears to be better, even if, at the present, it is expensive and not very easy to use.

We are always interested in good engineering software, and will be glad to hear from anyone about programs which they have found well-written and useful.

THE VIEW FROM THE FIELD

TREND INDICATION, INCONVENIENCE OR NECESSITY ?

Back when process operations were controlled with chart indicator controllers, it was quite simple to get a handle on the behavior of the process by comparing the trend of several process variables on the charts a few hours back. As a matter of fact, one could sometimes even predict what the process would be doing in the next few hours. This would give the operator a chance to make adjustments in anticipation of coming events and thus preventing excessive ups and downs.

Today, in our age of computerization and digital readouts, trend indication is sometimes looked upon as an inconvenience and an added cost to programming and hardware. It is with reluctance, that this feature is added to a control system, because in the eyes of those responsible for programming and budgeting it's just one more of those "conveniences we can do without"--- Oh really!

Not so, says the operator that has some pride in the operation of his process: dollars can be saved by being able to match blips in the variables to events that caused a particular problem, so that a repeat thereof can be prevented in the future. You can't see blips by staring at digital numbers, you only see numbers jiggling which compared to other jiggling numbers really mean nothing. Furthermore, if you ever need evidence to evaluate a problem for cost control or even for legalities, a chart printout is much more explanatory than a printout of millions of digits.

If Confucius were alive today he would probably say: "One picture worth thousand digits"

By incorporating an easy and fast access to trend indication in your control systems (the key words being "easy and fast"), many mishaps in today's process operations may be prevented; this is particularly important for environmental awareness and protection.

Inconvenience ? hardly. Necessity ? definitely.

TANK EMISSIONS

Our spreadsheet for calculating vapor losses from pickling tanks into the exhaust air remains much in demand. If you need to do such calculations, to meet the new reporting requirements, call or fax us for a copy - it's free. If you don't have Lotus or Excel, we can tell you how to do the calculations, or, if you prefer, run the calculation for you.

The spreadsheet will calculate HCl, nitric/HF and water losses for both open and closed tanks. Unfortunately, sulfuric acid losses are purely mechanical, and not possible to predict...

Sorry about that, sulfuric picklers!

GOOD FOR A LAUGH

What worries me is, why did God give the tortoise a drag coefficient of 0.00006?