

ESCO NEWS

OCCASIONAL NEWS AND INFORMATION FROM ESCO ENGINEERING NO. 4, April 1993

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IT'S FREE!!

TANK EMISSIONS

We have had a number of enquiries, recently, for methods of estimating emissions from open liquid surfaces - prompted by the USEPA work on development of regulations for the new Clean Air Act.

We have a procedure for calculating surface losses of hydrochloric acid, hydrofluoric acid, nitric acid and water from the open surface of tanks, which is available to ESCO customers. We are developing a spreadsheet to do the calculations, which will also be available soon. We expect to have this in Excel, 1-2-3 and Quattro-Pro formats - write or fax us for a copy.

WHY'S AND HOW'S

Our updated version of "Why's and How's of Sulfuric Acid Pickling" is still available. Just contact us for your free copy.

STUDENT'S VIEW

Our two co-op students from Kingsville District High School share their thoughts:

David Anderson says "When I filled out my option sheet about halfway through Grade 11, I wasn't sure how I would like Co-op. I expected a few hours every other day of boring work, followed by the joy of having an hour of school every now and then. Since then I have learned a lot about how things work in a drafting environment, which I hope, will help me a great deal in my career as an architect. The people at ESCO Engineering are surprisingly friendly, and have taken time out of their work on many days to help me understand the drawings I have worked on, and how they relate to the other work going on at the same time. Now I am glad I applied for the position, and I look forward to continuing to work for them as an after school job".

Heidi Verbeek adds "Since Grade 10 I have wanted to be an engineer. When I found out in Grade 12 that I could work through the high school co-op program at an engineering firm, I knew this was an opportunity I couldn't miss. The thought of working at ESCO gave me one

main fear. What if I didn't enjoy engineering? My dream would be shattered. Luckily, my fear hasn't come true, and working for ESCO has reassured me that my dream is possible if I work hard enough. Unlike many students, I have seen a glimpse of the world after university. The best thing about my glimpse was that I liked what I saw.

We appreciate the time and effort both Heidi and David have put in helping ESCO's day to day operations run smoothly....Ed.

NEW CAPABILITIES

To expand our data handling, calculation, design and presentation capabilities, ESCO has recently acquired:

- an ink jet *colour* printer, allowing us more versatility in presenting data
- Quattro Pro for Windows Version 1, increasing our spreadsheet capabilities
- Access, a database management package
- Fluid Flow modelling software, which uses Finite Element Analysis (see below for more information)

and finally

- AUTOCAD Release 12

FLUID FLOW MODELLING

ESCO is now using computer modelling to help our customers reduce costly field tests, and to optimize design. By applying finite element analysis (FEA) techniques to Fluid Flow problems, we can test modifications aimed at improving flow patterns through equipment on the computer rather than in the field.

The cost of the computer modelling is far less than the cost of actually making modifications to equipment and running full scale field tests. Computer modelling of fluid flow can also offer valuable information on what is happening in existing equipment, allowing easy identification of areas for improvement.

THE VIEW FROM THE FIELD

Water, water everywhere, and not a drop to drink...That's what we'll be facing within the next few decades if we can't control the "Wide Open

Jacks” still prevalent among the special breed of “Homo Processum Operatus” (i.e. process operators).

Every process is designed to use certain amounts of utilities such as steam, air and water, and to produce certain amounts of condensate, air and waste water under certain process conditions. Numerous hours of calculations, contemplations and headaches have gone into determining at what rates these utilities are needed to give optimum performance of the process.

Then along comes “Wide Open Jack” who ignores all of that, for ‘consistent’ operating settings (i.e. extra time to drink coffee and read newspapers), creating what we call “the Niagara Falls Syndrome”, i.e. if it’s available, use it, or the more, the better.

This syndrome is what will deprive the future “Homo Erectus” of the aqua needed to survive on this planet. The following advice is offered to the present day “Homo Processum Operatus”:

Never use too much of anything, particularly water; only use just enough to do the designated job.

ESCO WORKS

Some recent jobs by ESCO include:

- rotary vacuum filter trials at a pup mill
- design of an acid wastewater neutralizing system
- inspection and recommendations for repair of two continuous steel pickling lines
- feasibility studies on various tomato paste processes
- computer modelling of fluid flow in thermal processing equipment

FUME EXHAUST TIPS #2

Hood and Equipment Design

Careful hood design helps minimise air flow rates - see tip #1 for reasons why this is a good thing. Wherever possible, hoods should be designed *as an integral part of the equipment*, and not as an add-on or afterthought - integrating hood and equipment design saves costs and improves air capture by allowing the

hoods to be located at the best place, rather than wherever the process permits.

An important object in hood design is to try and *avoid extracting fumes* - the term fume extraction is misleading. What we are trying to get is a fume control system, i.e. something that will prevent fumes from escaping into the workplace. If we extract less fumes, less materials and heat are wasted, and the less fume scrubbing is needed. Here are some ways of achieving this:

- minimise the size of openings in hoods
- provide flaps or doors in hoods, to close off openings, but still allow access for operations
- locate exhaust air takeoffs near openings instead of at the centre of the tank. In this way, a curtain of relatively clean air blocks escape of fumes, with minimum loss of process materials
- handle fume hoods, and maintain fume control equipment as carefully as process equipment; don’t say “it’s not important for production”!

Next time, we’ll take a look at fans.

BACK ISSUES

If you are a new ESCO customer, and would like to have copies of previous issues of ESCO news, mail or fax us, and we’ll be glad to supply them.

GOOD FOR A LAUGH



food and chemical process plant design • piping • metal pickling • fume and pollution control