THE CLARIFIER

Volume 10 Number 2 **September 1999**

The following article appeared in the Consultant's Corner of the June, 1999, issue of Airport Business Magazine.

JFK's Large-Scale Filtering Initiative

By Jerry Biscardi, Port Authority of New York & New Jersey

John F. Kennedy Int'l Airport, one of the largest users of jet fuel in the world, consumes on average 3.5 million gallons of jet-A fuel daily — that's 100 million gallons monthly and an annual consumption in excess of 1.2 billion gallons. The fuel storage area was built in stages, with some filtration equipment dating back to the 1940s.

The Port Authority of NY & NJ is responsible for the inbound filtration, and accomplished this task utilizing 54 individual pre-filters and filter separators. The authority evaluated the system and resolved that maintenance and element replacement costs could be greatly reduced with a consolidation effort. However, it needed to ...

- find filters that could handle the 5,000-plus barrels per hour rate that the pipeline provided;
- protect the stored fuel from dirt, water, and other contaminates; and
- do it simply, efficiently, and at low cost.

A custom filter separator vessel and oversized pre-filter were designed and supplied by Velcon Filters, Inc., to meet JFK's needs for efficient filtration at high flow rates. It involves a skid-mounted system designed by the authority in conjunction with Gammon Technical Products. Each skid incorporates two filtration banks, each made up of a pre-filter and filter separator complete with automatic control system.

Each bank is capable of handling the full system flow rate. However, the system normally flows through only one bank. If the primary bank experiences high differential pressure or a trace of water, the system switches to the alternate bank. If that bank also experiences high differential pressure or trace water, the system controller will then return the primary bank on-line, placing the full system flow through both banks and avoiding a complete shutdown of the pipeline.

By reducing the flow through each vessel, the automatic water drains will be able to remove moderate amounts of water without affecting performance. If the water or dirt problem continues, then both banks will shut down, thus protecting the fuel farm. While all this is happening, an audible alarm and strobe light will alert the operator of a problem.

To date the Port Authority has completed two of the four stations. Results: 400 million gallons before a filter changeout. Tank contamination problems down stream have been for the most part

(Continued on Page 2)

CONTENTS

Frequently Asked Questions & Answers

Q Do coalescers in API-1581 qualified filter/separator vessels sacrifice coalescing ability at lower than qualified flow rates?

A At maximum qualified flow rates, the coalescers perform extremely well assuming that they are not plugged up with particulate matter in excess of 15 psid differential pressure and they are not disarmed with surfactants. We have taken these coalescers down to as low as 5% rated flow and observed the coalescing to be as good or better than at rated flow. Lower than qualified flow rates in API-1581 qualified F/S vessels is okay.

However, be sure not to EXCEED the qualified flow rate for the vessel. Exceeding the flow rate can decrease coalescing ability, force coalesced water drops through the separator and force some normally captured particulate matter through the coalescers.

Summary: LOWER is OKAY; HIGHER is DANGER!

Q Why does Velcon use cork for gaskets on blind flanges?

A We use Buna cork, which is cork impregnated with Buna "N", because it seals better and it complies with MIL-C-6183A Type 1 Class 1 Grade Medium.

Changes to Mobile Filter/ Separators

The proposed 4th Edition of API-1581 will require that all new filter/separator vessels be tested with 3% water. This includes both fixed and mobile F/S vessels.

The mobile into-plane F/S vessels have been tested and qualified to date with 1/2% water. Existing mobile F/S vessels, when the 4th Edition API-1581 is published, will still be able to be qualified with tests at 1/2% water. However, **NEW** mobile into-plane F/S vessels will be tested with 3% water.

What this means is that, to achieve the same flow rates, **NEW** 4th Edition qualified into-plane F/S will be bigger than the 3rd Edition qualified vessels by about 10-20%. This is mainly due to more separator capacity for the extra water.

This will be a challenge for the refueler/ servicer builders, and will result in new designs from the F/S manufacturers.

Velcon Videos Available on CD-ROM

Last Spring, Robin Mason was visiting with Hanevel, our distributor in Singapore. While he was there, David Ngiam gave him a CD-ROM with both Velcon Videos on it (Cartridge Changeout Procedure Video and Coalescing Video). We had so much fun with it that we thought everyone else might too. So we had a bunch more made up. If you would like to receive a copy, please contact Julie Brewster via phone fax or e-mail (phone numbers and e-mail address are on back page) and we'll send you a copy.

Teflon Coated Screen (TCS) Separators - "A Bit of a Primer"

Many of you have probably noticed the clear "band" of material which is applied on the TCS screen at the open ends of our TCS separators, and extends about 1/8" above the endcap. Ever wonder what this band of material is for?

We dip the ends of the TCS screen, which will be placed into the open-end endcaps, into a sealant material. The "primer" material seals off this portion of the TCS screen. When the TCS elements are installed into a vertical filter/separator vessel, it is possible for some of the blocked water droplets to accumulate around the lips of the endcaps at the bottom portion of the TCS separator. The "primer" bead prevents the water droplets from being forced through the TCS screen.

JFK Filtering Initiative

Continued from Page 1

eliminated — to the point that now downstream filters are changed due to age, not plugging. Also, the four stations are being strategically positioned to serve JFK's five active barge piers in the event of pipeline outages.

Success with the project has the authority considering consolidating the first phase with 16 tanks originally planned for the final phase. Such consolidation would allow for elimination of the last station, with lower costs yet twice the redundancy.

Jerry Biscardi serves as General Supervisor of aviation fueling for the Port Authority of NY & NJ.

Air in Filter/ Separator Vessels

Most operators know that air accumulating in filter/separator vessels can possibly lead to internal fires, or possibly lids being blown off. Thus, it is important to fill F/S vessels ***slowly*** when being put into service after an element changeout.

It is also worth noting that many systems can get air accumulation in the vessels from transport truck or rail car delivieries. The truck pump or system pump can suck air from the truck or rail car when nearly or fully empty. Consideration should be given to the use of coarse air eliminators upstream of the filter/ separator vessels in these systems.

A filter/separator that is somewhat "overlooked" is the side-opener F/S where the lid is rotated 90 degrees and is now on top of the vessel. There are a large number of these vessels in use on into-plane servicers. These vessels can accumulate a large quantity of air under the lid. We recommend that users look into modifying the lid to include a vent port. This operation can be performed by someone from a company that holds the National Board Certificate of Authorization for use of the "R" stamp, or "R stamp holder".

Get the AIR OUT!!

Black Spots on Coalescer Socks

Often when operators change out the old coalescers for a new set, they see a few or a large number of black spots on the outer white socks of the used coalescers. These spots are caused by microbial growth which occurs because the socks have been wetted by water, and at the water/ fuel interface at the outside of the coalescer, microbial growth can occur.

The outer socks on the coalescers which have been qualified in vessel/element combinations to API-1581, 3rd Edition, are made of cotton. The cotton socks produce larger water drops, required to pass the stringent API-1581 performance tests.

Earlier versions of some coalescers were made with synthetic material socks. The microbial growth did not occur on the synthetic socks, but the synthetic socks produced smaller water drops than the cotton socks. Ideally, the outer socks on the coalescers would be made of a synthetic material which produced the big water drops, but which did not promote microbial growth. We have tried many times in the past to find such a material, but no success so far. We keep looking!

We have run a large number of single element coalescing tests in our open coalescer test chamber. Many of the coalescers are spotted with the microbial growth black spots. All of the coalescers will coalesce properly, even with the black spots (unless the coalescer is internally disarmed with surfactants). Only when the microbial growth is so bad that visible slime is observed, or holes in the socks are caused by the microbial growth, do we see the coalescing degrade to being unacceptable.

There used to be a number of the "old timers" who would change coalescers when they saw what appeared to be "excessive" black spots (very subjective analysis!). They were at least being conservative - if this was one of their coalescer change criteria, they were changing on the early, safe side.

We agree, the black spots do not appear attractive, but only when visible slime or holes are observed in the socks will there be an effect on coalescing due to the microbial growth.

Service Awards

Velcon Filters would like to recognize the following individuals celebrating employment anniversaries with us: Sheryl Farris — 25 years, Joan Scher—20 years, Dave Garcia — 10 years , Linda Conway—5 years and Nancy Markle—5 years.

Sheryl started with the company in August, 1974 in Production at the Roll-up table, moved onto HR and has been in Order Entry "for at *least* 15 years." (She must have been having fun if she can't remember!) Sheryl was instrumental in getting our Order Entry program installed 5 years ago and has recently worked with MIS to update the system. When asked what she attributed her longevity at Velcon to, Sheryl replied "Being lucky enough to work with people who are tolerant of me."

Joan started with the company in July, 1979 as a production worker, became Production Manager and has worked her way up to Corporate Materials Manager. Asked what qualities it took to work for Velcon for 20 years, Joan replied "It helps to be a little bit crazy!"

Dave started with the company in June, 1989 as a Hydraulic Lab Technician and is now our Senior Test Technician.

Linda joined Velcon in July, 1994 as the Controller and is now our Chief Financial Officer.

Nancy Markle joined Velcon in August,1994 as Export and Freight Expediter. She has held many different positions with the company and is currently Industrial Engineering Technician.

We would like to congratulate all five for their contributions to Velcon's success!

ACO “K” Series Only Available in One Half Micron Rating

Our new ***Aquacon***® ACO Series K elements are only available in a one half micron rating for the following reasons:

• The difference in life expectancy, if any, is very minimal between the one half micron media and the five micron media. The water holding capabilities will be the same with the old ACO 5 micron C series elements as it is with the new one half micron ACO K series elements.

• Based on the particulate levels of Jet Fuel and Avgas, we find that Avgas is generally cleaner than Jet Fuel. So a one half micron element (the industry standard micron rating for Jet Fuel) should actually last longer in Avgas.

• The trend seems to be a move towards one half micron filtration for Avgas usage. Therefore, eventually there will be no need for five micron elements.

• The tighter one half micron media aides in the shutdown performance of the newly designed ACO K series elements.

• A simplification of inventories will help prevent multi-product end users from accidentally installing a 5 micron element (traditionally used in Avgas) into a Jet Fuel system, resulting in noncompliance to the specification.

If you have any questions, please contact Rick Waite or Rick McKenna at Velcon.

If you know anyone who would like to receive ***The Clarifier***, fax their name, company and address to:

We also welcome your comments and suggestions on topics covered in ***The Clarifier***.

Velcon Filters, Inc.
Attn: Julie Brewster
4525 Centennial Blvd.Colorado Springs, CO 80919-3350
Phone: (719) 531-5855
Fax: (719) 531-5690
e-mail: vfsales@velcon.com

4525 Centennial Blvd
Colorado Springs, CO 80919-3350

BULK-RATE
U.S. POSTAGE
PAID
COLO SPGS, CO
PERMIT NO. 623