



# Facet

# International

a **CLARCOR** company



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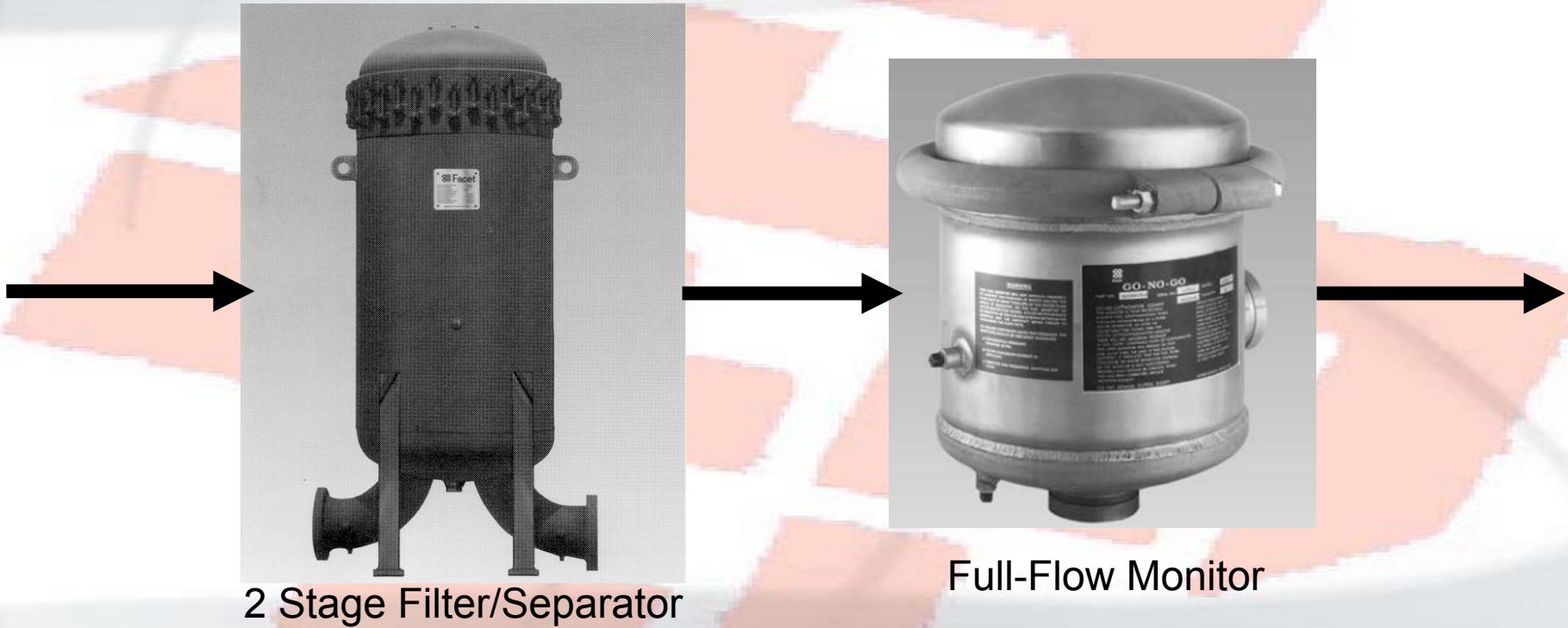
# CLARCOR, Inc.

- New York Stock Exchange: CLC
- \$900 Million Total Net Sales
- 26 Manufacturing Facilities
- 30+ Company Owned Branches and Distribution Centers

# Introduction of Monitors

**1957** - Bendix Filter Division (became Facet in 1978) introduced the very first full-flow fuel monitor - the Go-No-Go® – for the United States Military in response to concerns with the performance of filter/separators.

# Flow Diagram

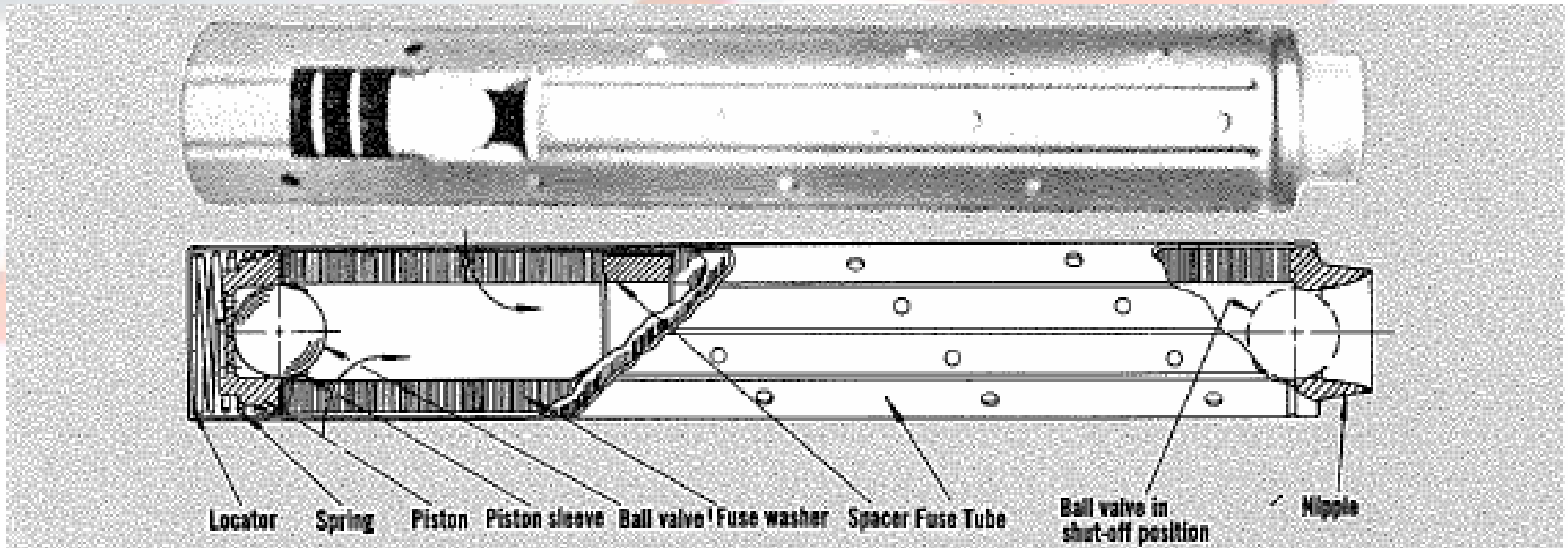


2 Stage Filter/Separator

Full-Flow Monitor

# 1963-The Aviation Industry's First Full-Flow Monitor Qualified to MIL-M-81380

## Facet Go-No-Go® (GNG) Delta-P Fuse

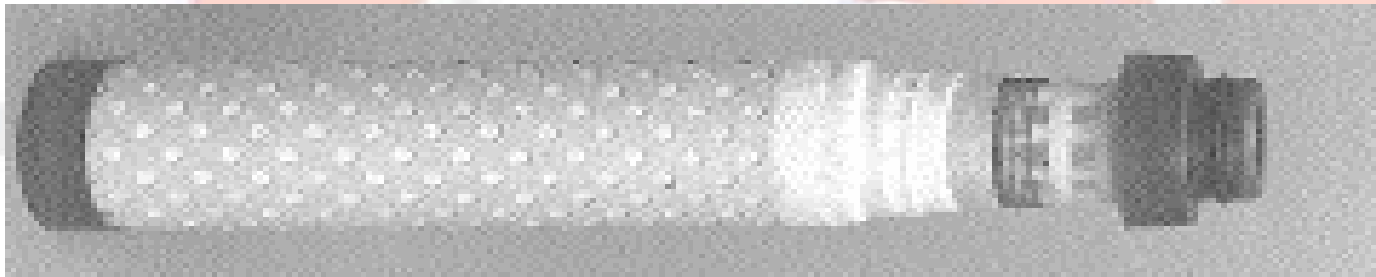


The Facet Go-No-Go Gage is the first practical and economical tool developed to check the cleanliness of fuel transfer conditions. It is called the Go-No-Go Gage because it permits acceptable fuel to pass through, but acts as a positive cutoff unit if the fuel is contaminated above a pre-determined level with water and/or solids.

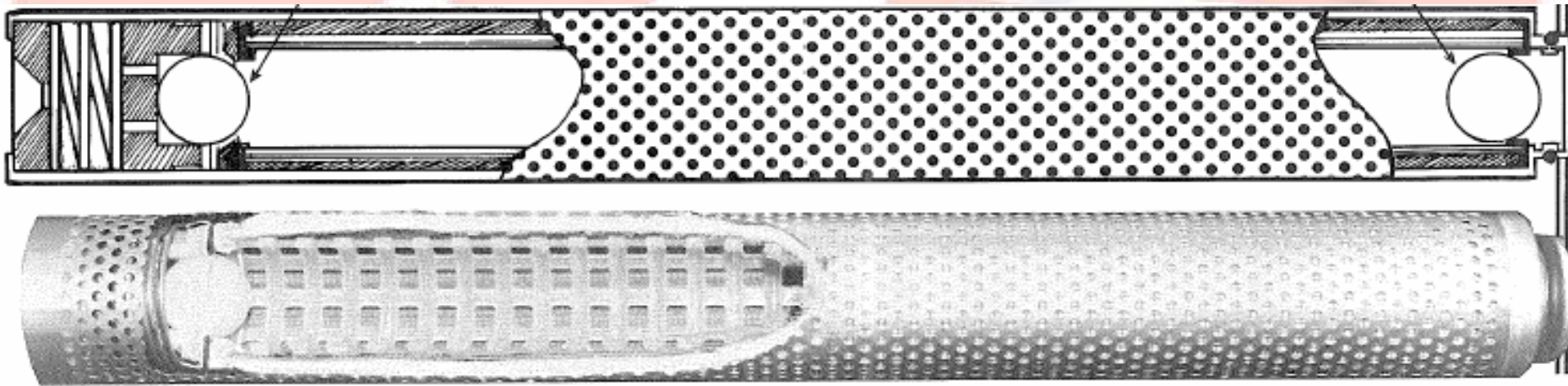
The Go-No-Go monitors the total flow of fuel being transferred, not just mere samples. The Gage also traps and retains the bulk of solid contamination and absorbs undissolved water passed by filter water separators operating under normal conditions.

**1965-** Bowser-Briggs  
introduces their Petro-Guard  
full-flow monitor qualified to  
MIL-M-81380

**1978** - Velcon introduces the first monitor (CDF<sup>®</sup>) using super absorbent materials



**1981**- Facet introduces their commercial Go-No-Go<sup>®</sup> monitor using super absorbent materials





**1987- API publishes 1583  
“Laboratory Tests And Minimum  
Performance Levels For Aviation  
Fuel Filter Monitors”**

**1988**- Facet and Velcon  
both introduce monitors  
qualified to IP 1583

- 1995-** IP 1583 2nd Edition
- 2000-** API/IP 1583 3rd Edition
- 2002-** United Airlines reports Electrical discharge in monitors
- 2003-** Industry Recommends 1 year service life for monitor elements
- 2004-** API/IP 1583 4th Edition
- 2004/2005-** Test Stand put in at O'Hare, results are inconclusive

# 2005

- USAF experiences flame outs – final report attributed to migration of CMC into the fuel controls
- API withdraws support of 1583 document
- EI maintains support of 1583
- IATA task force is created

# 2006

- Warning notice issued by EI that monitors could no longer be considered “fail-safe”
- EI publishes Draft Standard IP1583 5th Edition
  - 4th Edition Formally withdrawn
  - Tests for media migration based on filter company recommendations
  - Existing monitors must show they pass migration tests – re-qualification tests
  - More options/types of elements to reduce emphasis on one type of monitor
  - Laboratory testing requirements to confirm that no SAP occurs in fuel downstream of filter monitors

# OVERALL IMPACT

- Difficult to predict but dependence on stand alone absorbent monitors is very unlikely
- Industry trend towards the use of filter/separators
  - Chevron Bulletin 2007/01 12 Feb 07 to convert back to FWS at their locations
  - All major oils bulletins warning against use with FSII
  - IATA Fuel Filter Task Force on media migration
- API/IP has issued draft standard 1599 “Laboratory Tests And Minimum Performance Levels For Aviation Fuel Dirt Defense Filters” for the use of non-SAP filters
- API/IP is developing Draft Standard 1598 “Guidelines for the Selection of Electronic Sensors for Monitoring Aviation Fuel Quality

# OVERALL IMPACT

- All major oil companies, Filter Manufacturers and JIG have issued operational bulletins prohibiting the use of monitors with FSII
- USAF has outlawed the use of monitors based on CMC media migration incident that caused flameouts on three trainer a/c
- IATA conducting study of on board A/C filters for the evidence of absorbent media

# OVERALL IMPACT

- Use upstream of additized fuel (FSII)
- Additional ITP sampling/testing
- Daily differential pressure readings at max Annual change out of monitors
- flow or corrected to max
- Flush new monitors for three minutes at full flow prior to use
- Change out  $\Delta P$  of 15psi or if element failure is indicated by sudden drop in  $\Delta P$  ( $\geq 5$ )
- Continue to “monitor” the situation closely



# QUESTIONS

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ational  
company