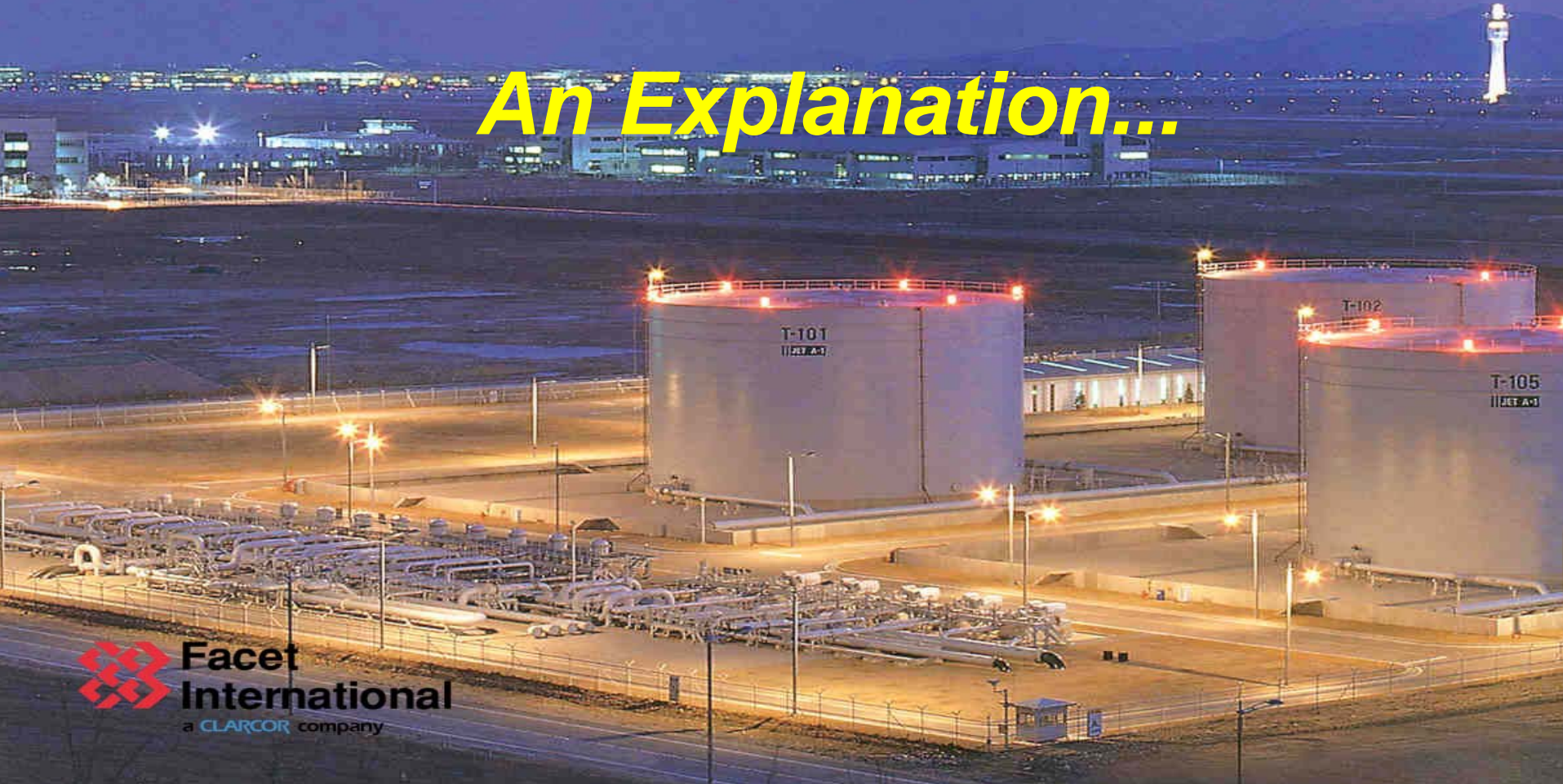


API/IP 1581

3rd vs. 5th Edition

An Explanation...



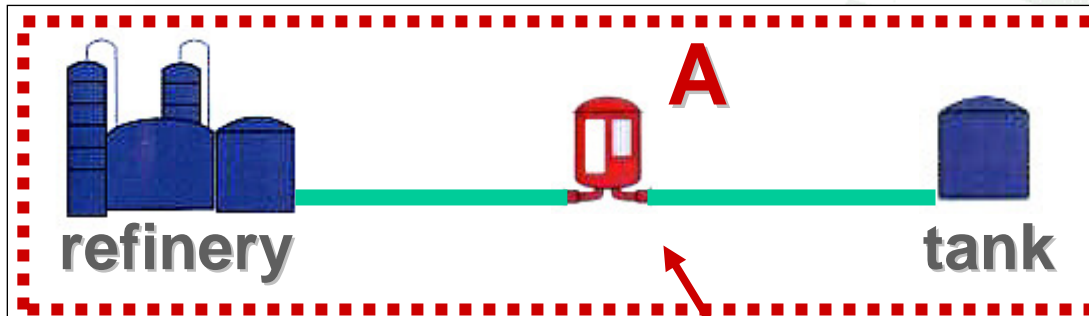


A.P.I. / I.P. Approvals And New Editions

- ❖ ~~A.P.I./I.P. 1581 Third Edition~~ **Fifth Edition**
- ❖ A.P.I./I.P. 1582 Similarity
- ❖ ~~I.P. Second Edition~~ **API/IP 1583**
- ❖ A.P.I./IP 1590



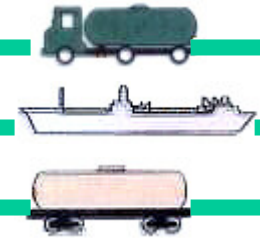
A.P.I. 1581 Third Edition



**Filter
Separator
A class**



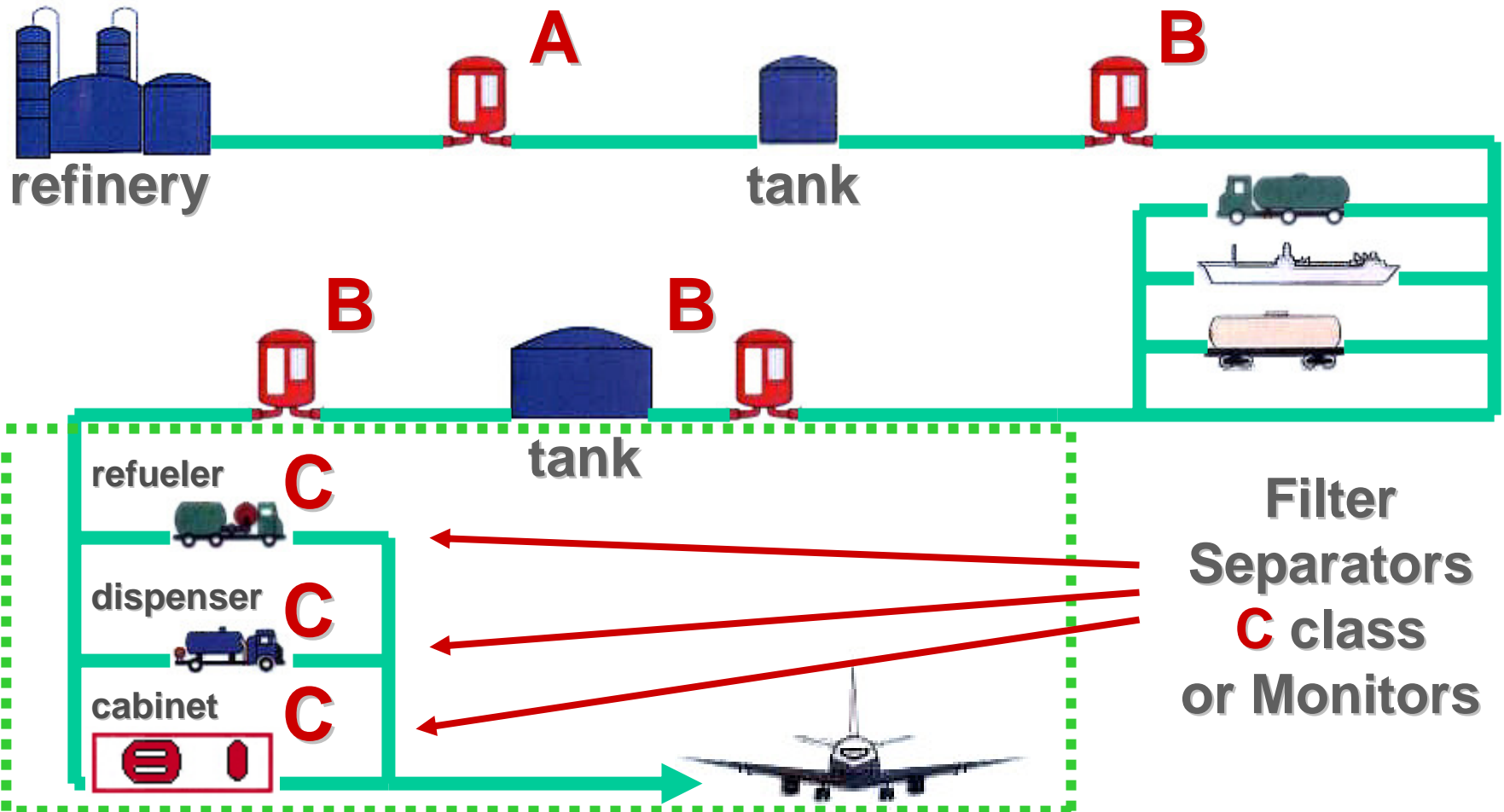
A.P.I. 1581 Third Edition



**Filter
Separators
B class**

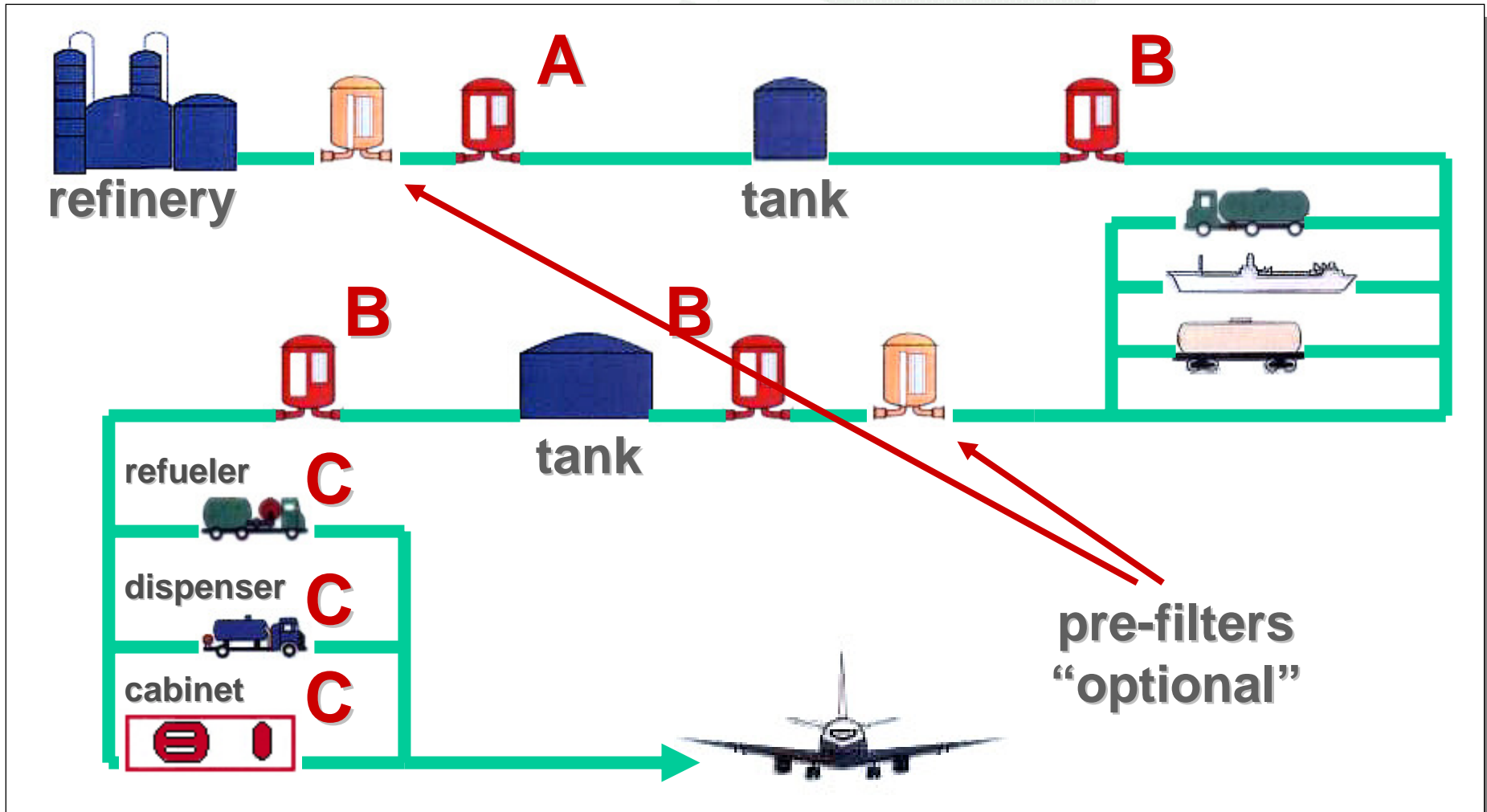


A.P.I. 1581 Third Edition



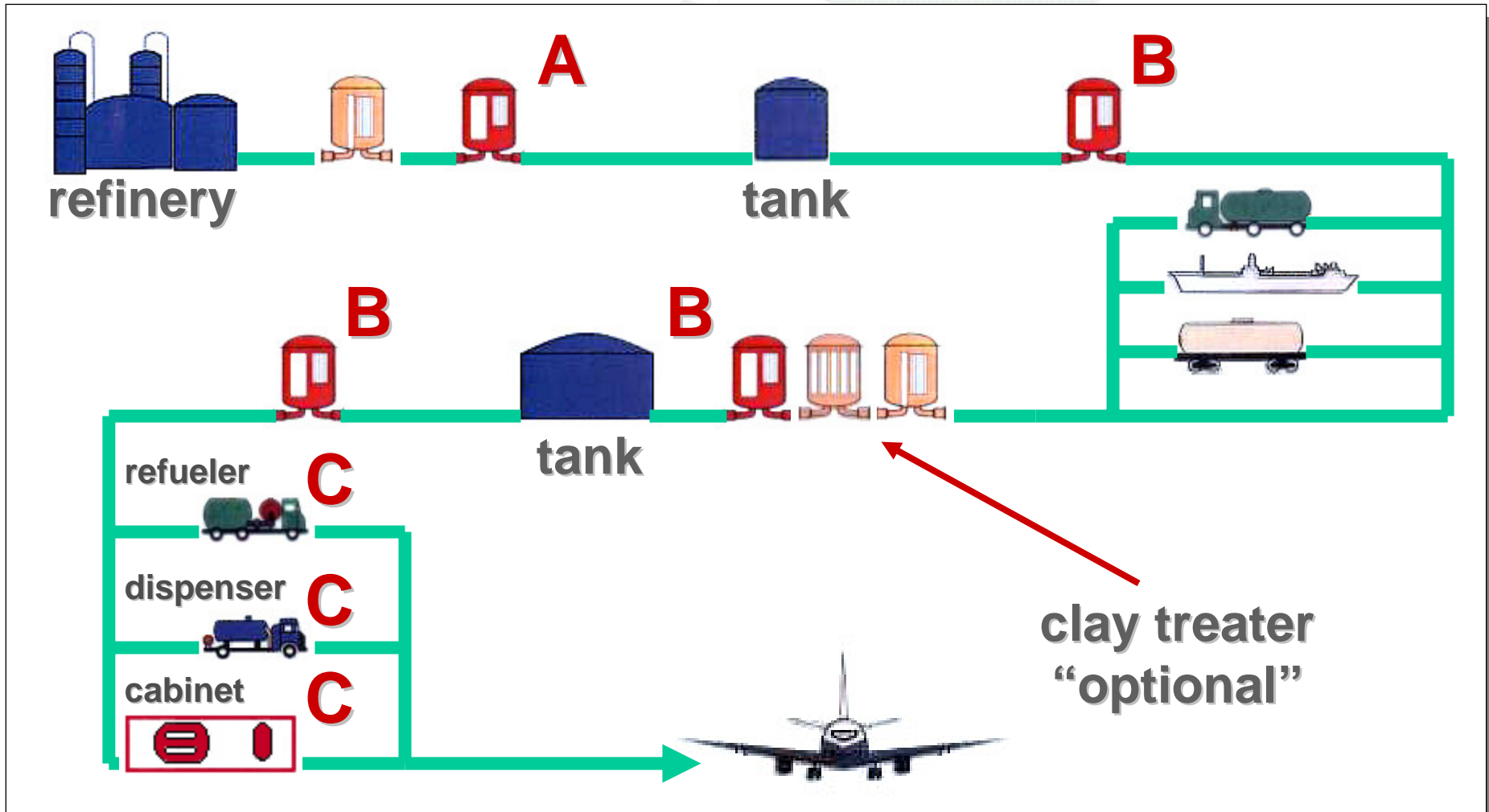


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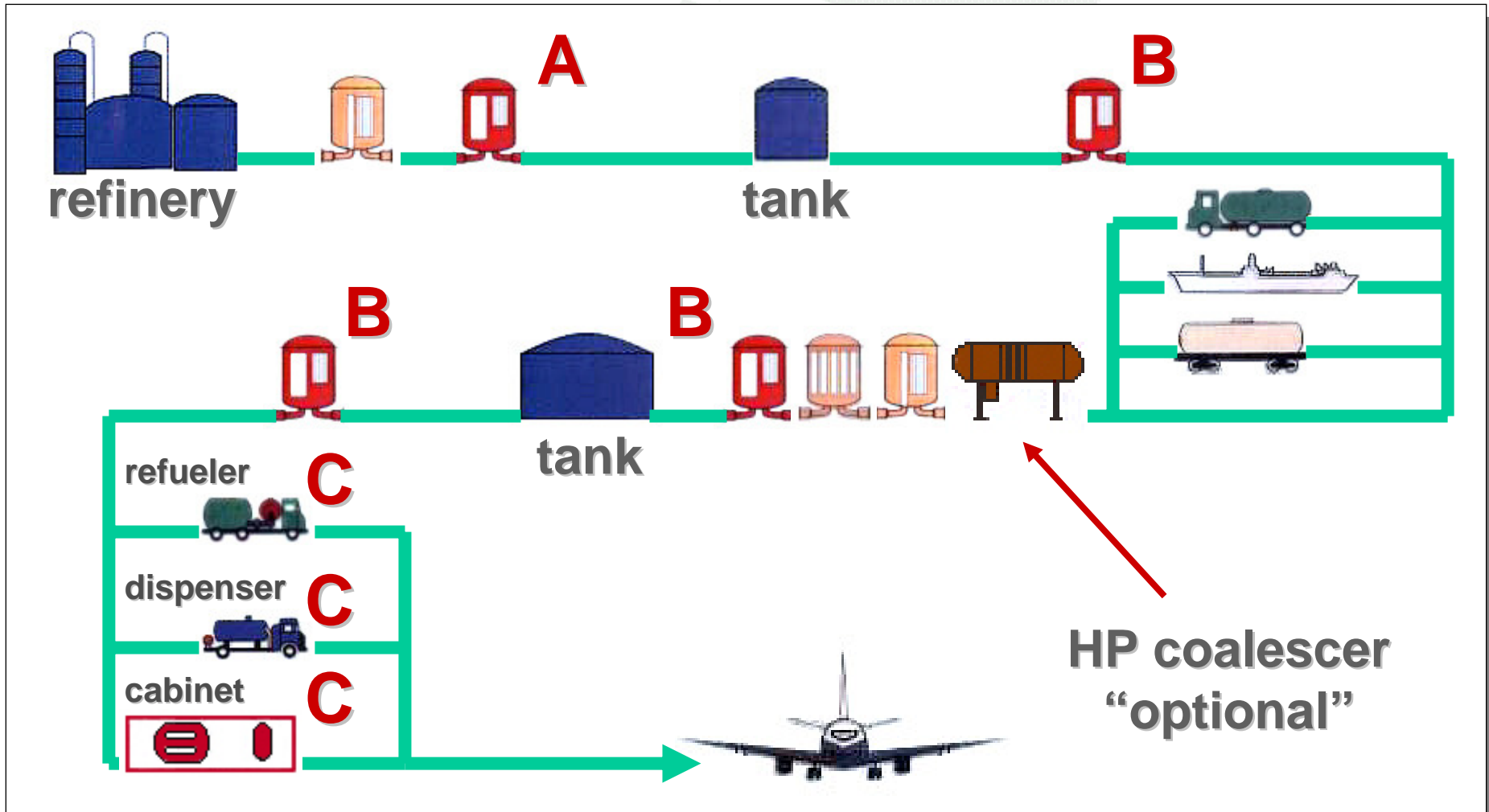


A.P.I. 1581 Third Edition





A.P.I. 1581 Third Edition





- **Improved refining processes are altering fuel chemistry. For example, in the Merox process surfactants can be formed creating fuel handling difficulties.**
- **To address the variances in fuel chemistry, fuels derived from different crude oils and processing techniques were tested to develop a “standard fuel” for testing equipment.**
- **Test fuels are Jet A or A-1 with standard additive packages, including the introduction of DCI-4A Corrosion Inhibitor at 15 mg/L replacing HiTec 580 at 2.0 mg/L the first time.**



New Editions: API/IP 1581 Fifth Edition

Filter Separators

- **Category C**
- **Category M**
- **Category M100**



API/IP 1581 5TH Edition: Filter Separators

- **Category C**
- **Category M**
- **Category M100**

Filter separator units qualified using fuel that might contain surfactants, and are intended for commercial aviation use only

**Jet A or A-1
+ Stadis 450
+ DCI-4A**



API/IP 1581 5TH Edition: Filter Separators

- Category C
- Category M
- Category M100

Filter separator units qualified using fuel that contains the additives required for some military use

Jet A or A-1
+ Stadis 450
+ FSII
+ DCI 4A



API/IP 1581 5TH Edition: Filter Separators

- **Category C**
- **Category M**
- **Category M100**

Filter separator units qualified using fuel containing additives required for military applications that need thermal stability improvement

Jet A or A-1

+ Stadis 450

+ FSII

+ DCI 4A

+ Betz/Shell thermal stability improvement additive

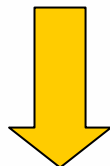


API/IP 1581 5TH Edition: Filter Separators

- **Category M100**



- **Category M**



- **Category C**

Qualification to Category M100 automatically qualifies to Category M and Category C at the same flow rate and conditions



API/IP 1581 5TH Edition: Filter Separators

- **Type S**
- **Type S-LD**



API/IP 1581 5TH Edition: Filter Separators

- **Type S**

For use at filtration points where significant levels of water and dirt can be expected

- **Type S-LD**



API/IP 1581 5TH Edition: Filter Separators

- **Type S**

- **Type S-LD**

For use at all filtration points where significant levels of water but minimal amounts of dirt can be expected



API/IP 1581 5TH Edition: Filter Separators

- **Type S**

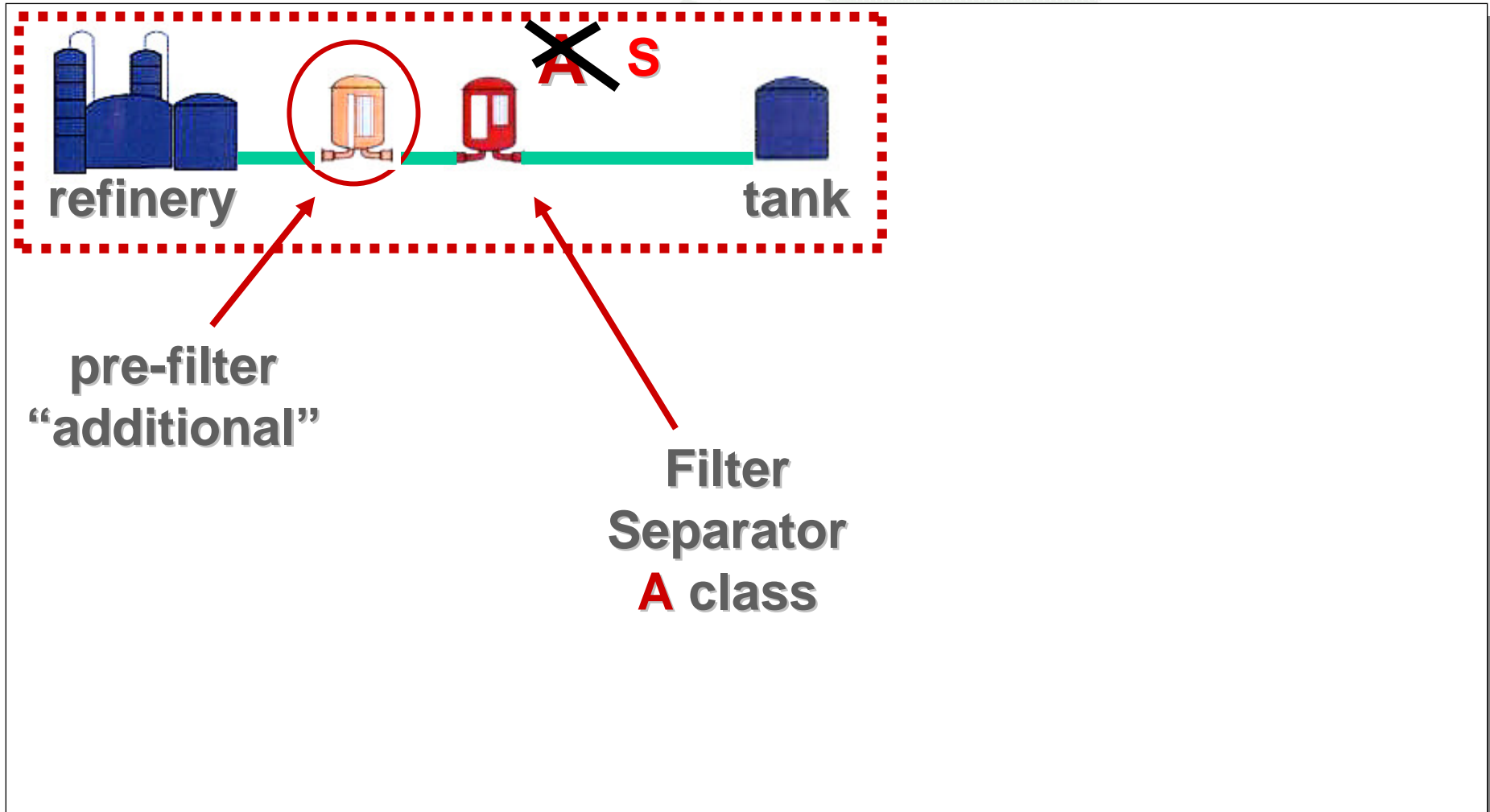


- **Type S-LD**

**Qualified Type S
filter/separators qualify as
Type S-LD for the same
Category at the same flow
rate and conditions**

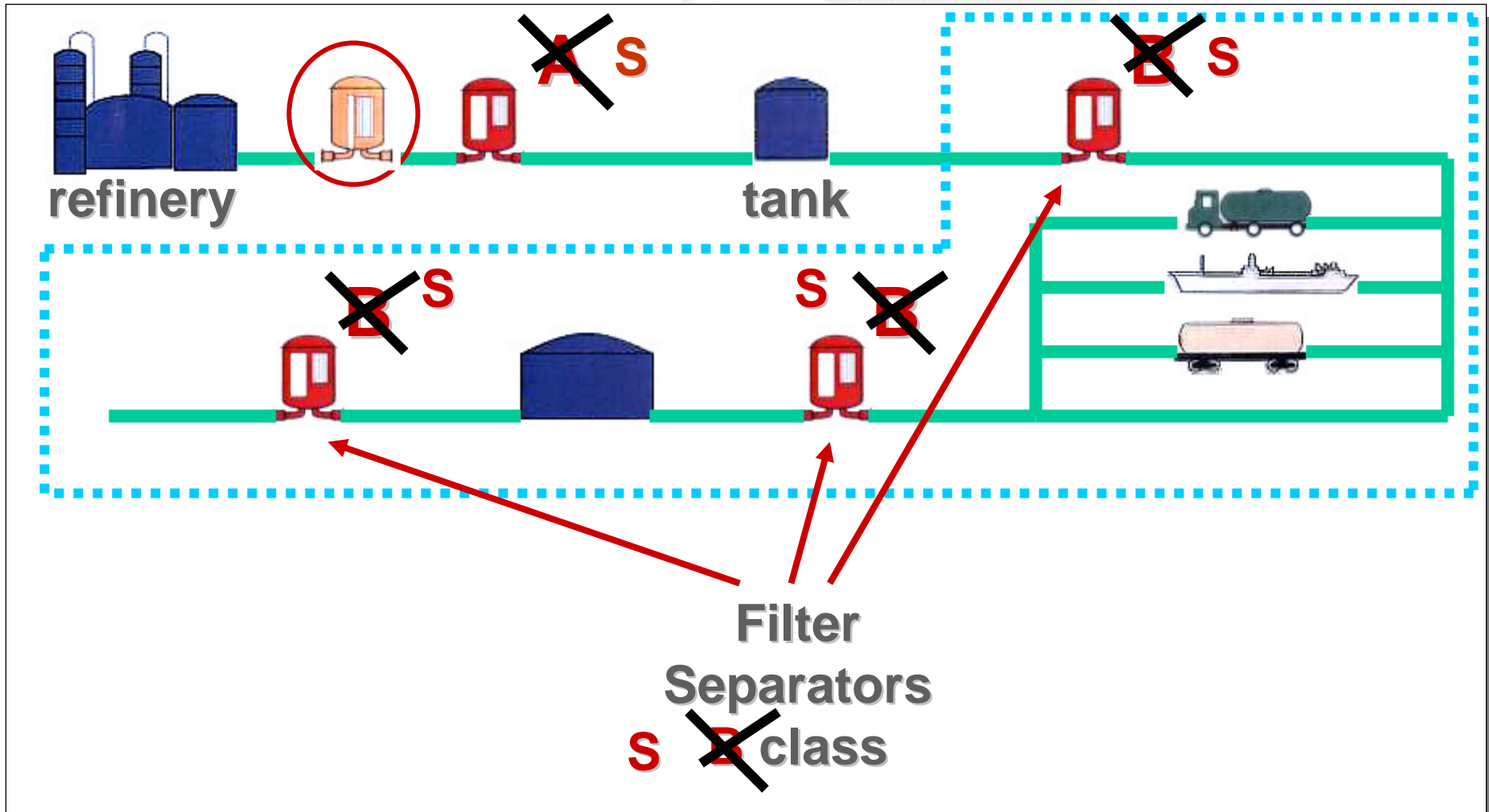


API/IP 1581 5th Edition



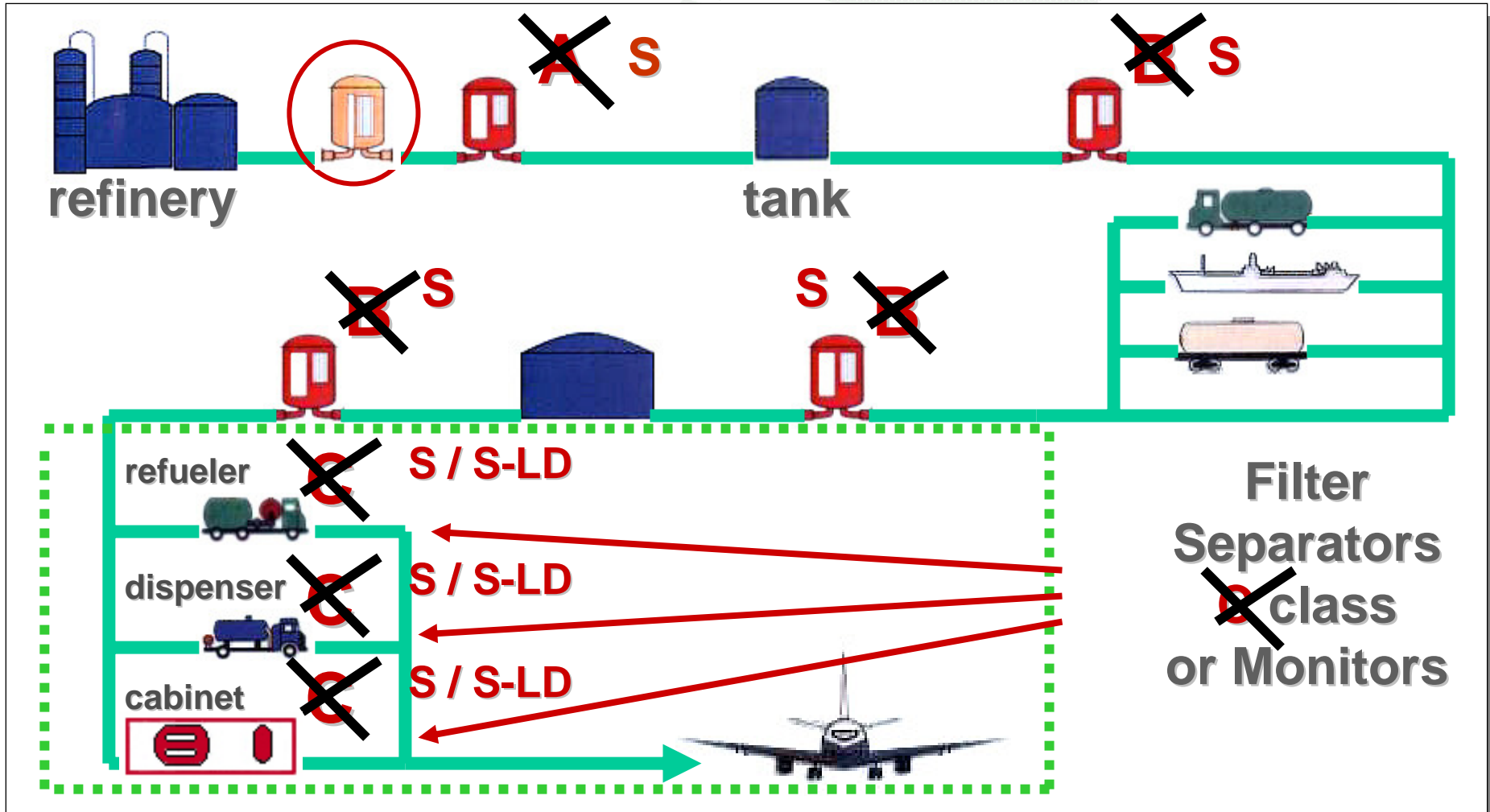


API/IP 1581 5TH Edition





API/IP 1581 5TH Edition





Test Comparison For Commercial Aviation Fuels

	A.P.I. 1581 3rd edition	API/IP 1581 5th Edition
	A Class Filter Separator	Filter Separator
Additives	Stadis 450 Hitec 580 (single element test)	Stadis 450 DCI-4A (single element test)
Solids	Fischer I – 116 @ 200 mg/USG/min	90% Ultra fine dust 10% Red iron oxide @ 72 mg/USG/min
Max. Water	10% for 10 minutes	3% for 30 minutes (or up to a differential pressure of 45 psi)



Test Comparison For Commercial Aviation Fuels

	A.P.I. 1581 3rd Edition	API/IP 1581 5th Edition
	B Class Filter Separator	S Type Filter Separator
Additives	Stadis 450 Hitec 580 (single element test)	Stadis 450 DCI-4A (single element test)
Solids	Fischer I – 116 @ 133 mg/USG/min	90% Ultra fine dust 10% Red iron oxide @ 72 mg/USG/min
Max. Water	3% for 30 minutes	3% for 30 minutes



Test Comparison For Commercial Aviation Fuels

	A.P.I. 1581 3rd Edition	API/IP 1581 5th Edition
	C Class Filter Separator	S or S-LD Type Filter Separator
Additives	Stadis 450 Hitec 580 (single element test)	Stadis 450 DCI-4A (single element test)
Solids	Fischer I – 116 @ 67 mg/USG/min	90% Ultra fine dust 10% Red iron oxide @ 72 mg/USG/min
Max. Water	0.5% for 30 minutes	Existing filter/separator 0.5% for 15 minutes New- 3% for 15 minutes



API/IP 1582 SIMILARITY



API/IP 1582 Similarity

Developed in effort to minimize the number of full-scale tests. The concept is that full-scale testing is not needed if a candidate filtration system can be shown to be sufficiently similar to a system already qualified (**by full-scale testing**) to support the expectation that full-scale testing would meet the API/IP 1581 requirements.

If requirements are met, the system is said to be **“qualified to API/IP 1581 by similarity”**.

Specification applies to two and three stage filter/separator systems **ONLY**.



API/IP 1582 Similarity (cont.)

It is recommended that **“DATA SHEETS”** be requested for each filter/separator converted to the 4th Edition of the API/IP 1581.



API/IP 1583 MONITORS



Qualification Requirements

	I.P. 2nd Edition	API/IP 1583 3rd Edition
	Monitors	Monitors
Contaminant	Fischer Scientific No. I-116 Red Iron Oxide	90-10% RIO R-9998 & A-1 Ultra-fine ISO-12103-1
Solids	10 mg/liter	10 mg/liter
Block Time	Solids 2", 10 min. 6", 50 min. Water, 2", 10 min. 6", 40 min.	Solids 2", 10 min. 6", 50 min. Water, 2", 10 min. 6", 40 min.
Water Add	50 ppm	50 ppm
Low Flow Water	No requirements	50 ppm @ 10% of rated flow



Qualification Requirements (cont.)

	I.P. 2nd Edition	API/IP 1583 3rd Edition
	Monitors	Monitors
Water Slug	Slug @ rated flow & slug @ 10% of rated flow	Slug @ rated flow & slug @ 10% of rated flow
Mandatory Full Scale	No requirements	Full scale vessel, 50 ppm
Full Scale Water Slug	No requirements	Less than 1% of flow



Qualification Requirements (cont.)

	I.P. 2nd Edition Monitors	API/IP 1583 3rd Edition Monitors
Test Fuel	ASTM-D-1655	ASTM-D-1655
Required Additives	Stadis-450 Hi-Tec E-580	Stadis-450 DCI-4A
Solids Inj. Methodology	Slurry, dry blanket, etc.	Slurry only, in a volume sufficient that 10mg solids per liter is injected for 70 min.



Qualification Requirements (cont.)

	I.P. 2nd Edition	API/IP 1583 3rd Edition
	Monitors	Monitors
Water Test Short Element	No requirements	Optional
Sea Water Test	No requirements	Optional



**CRC/API Working Group Meeting
May 24-25, 2001
Cincinnati, Ohio**

- **Several filter companies presented test data from tests with Petronate-L**
 - **All showed Petronate-L devastated coalescer**
 - **Proven at prescribed dosage and at 50% and 25% prescribed dosage**
 - **Data sets included M Category and C Category Fuel**



API/IP Filtration Sub-Committee Meeting October 15, 2001

- It has been agreed:
 - API/IP 1581 5th edition Category C test fuel chemistry will be revised to 1 Mg/L Stadis-450 & 15 Mg/L DCI-4A (represents a change in corrosion inhibitors from Hi-Tec 580 to DCI-4A)
 - Petronate-L will be removed from 5th Edition Category M and M100 test protocol
 - “Effective date” of API 1581, 5th Edition implementation will be extended from January 2002 to July 31, 2003
 - API/IP 1581 5th edition will be published by July 2002 with an effective date of July 2003 superseding the 3rd and 4th editions



API/IP Filtration Sub-Committee Meeting October 15, 2001

- **The 1581 5th edition test chemistry will be incorporated into API/IP 1583 filter monitors and API/IP 1590 microfilter specifications**



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