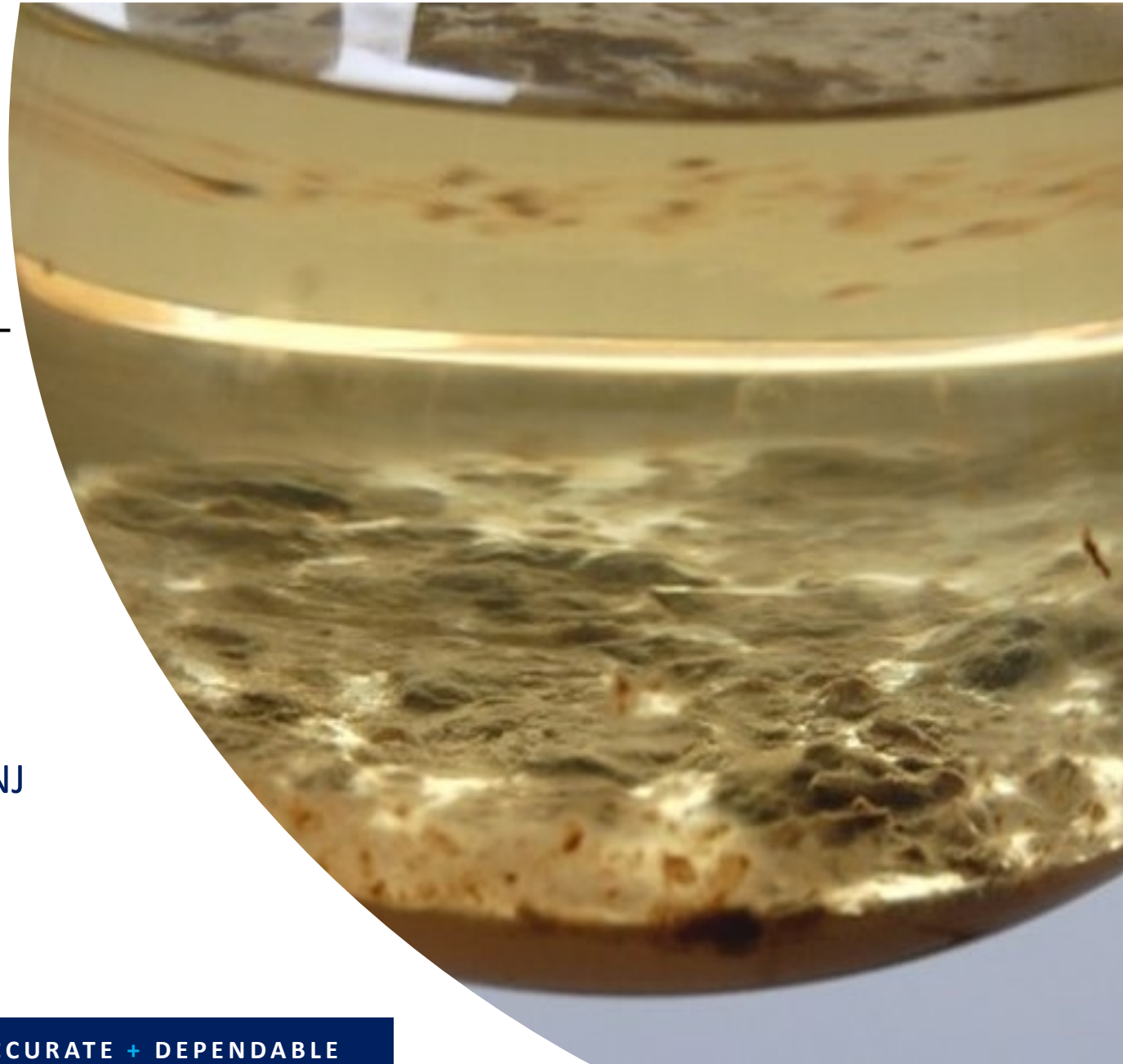

Microbial growth in aviation fuel

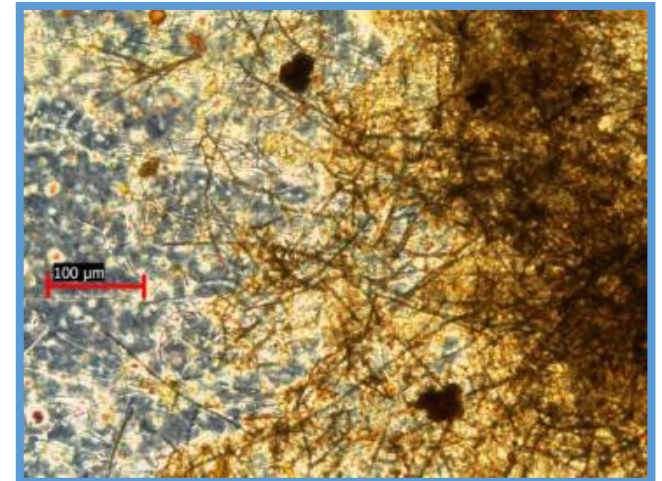
GTP Aviation Fuel Conference
DoubleTree by Hilton Tinton Falls, Eatontown, NJ

Dr Gareth Williams,
Microbiological Consultant
ECHA Microbiology Ltd. UK



Why are microbes a problem?

- Problems
 - Fuel quality & fitness for use issues
 - Filter contamination, clogging & by-pass
 - Fuel Quantity Indicator System (FQIS) failure
 - Corrosion of fuel tanks and fuel system components
- Consequences
 - Fuel supply failures
 - Aborted flights
 - Unscheduled down time
 - High cost for remediation
 - Operational Safety Issues



What makes microbes grow in fuel?

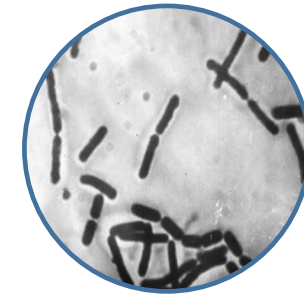
FOOD;

- Fuel
- Additives
- Dirt & contaminants

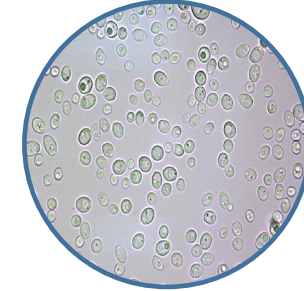


MICROBES

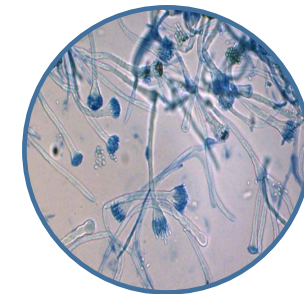
WATER



Bacteria



Yeast



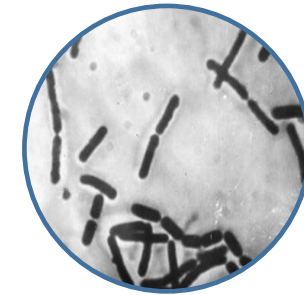
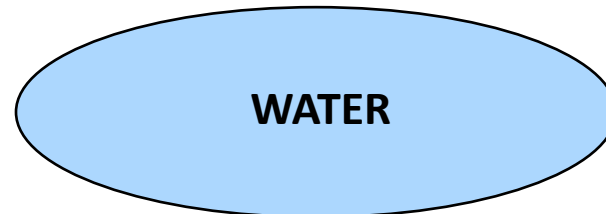
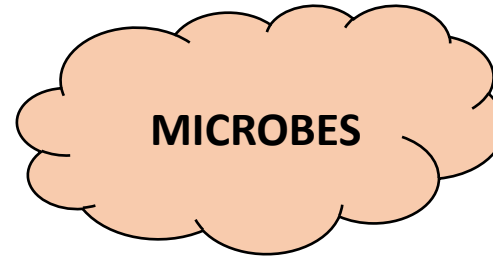
Mould

F
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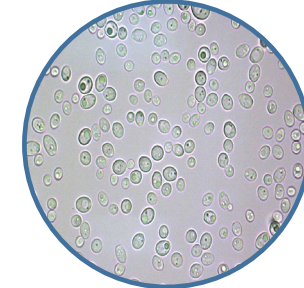
Free Water and Microbial Growth

FOOD;

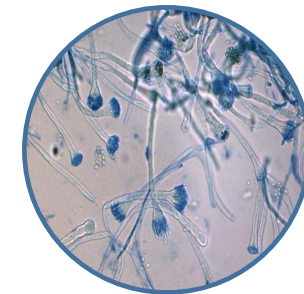
- Fuel
- Additives
- Dirt & contaminants



Bacteria



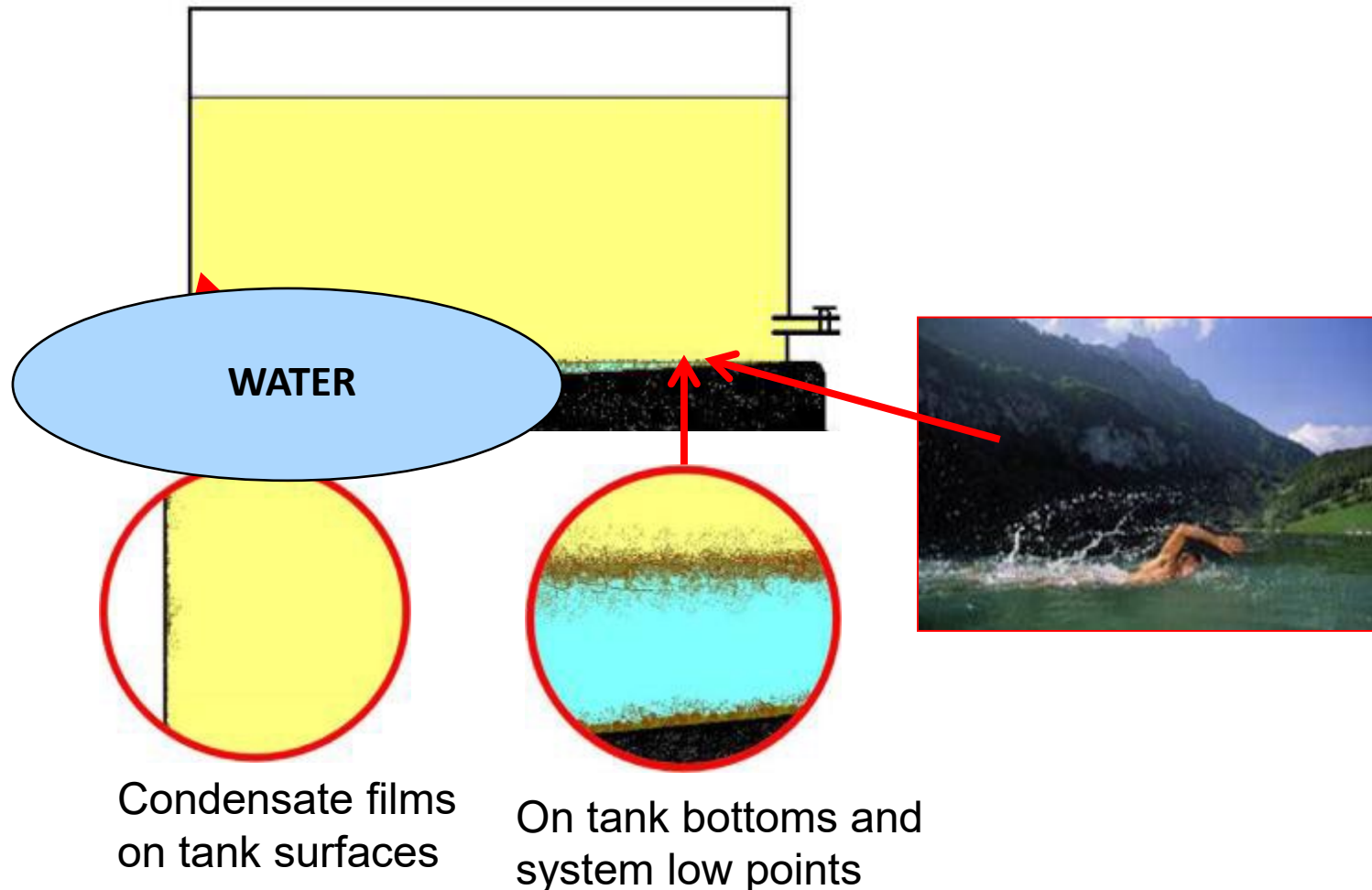
Yeast



Mould

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Free Water and Microbial Growth

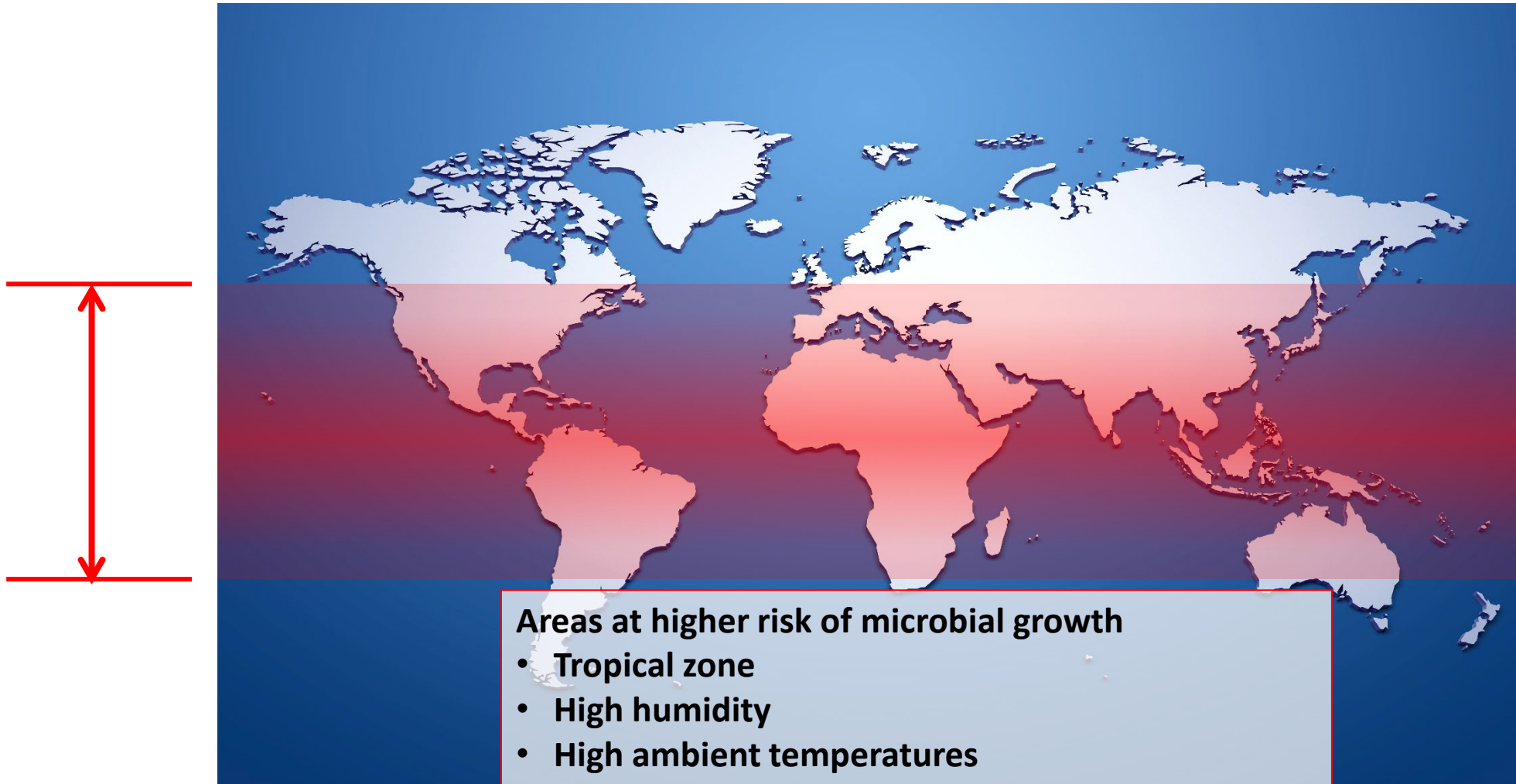


- Microbial growth occurs where FREE water occurs
- Only very little water is needed for microbial growth
- If you were a microbe, a 1 mm water film would look like a 300 m deep lake!

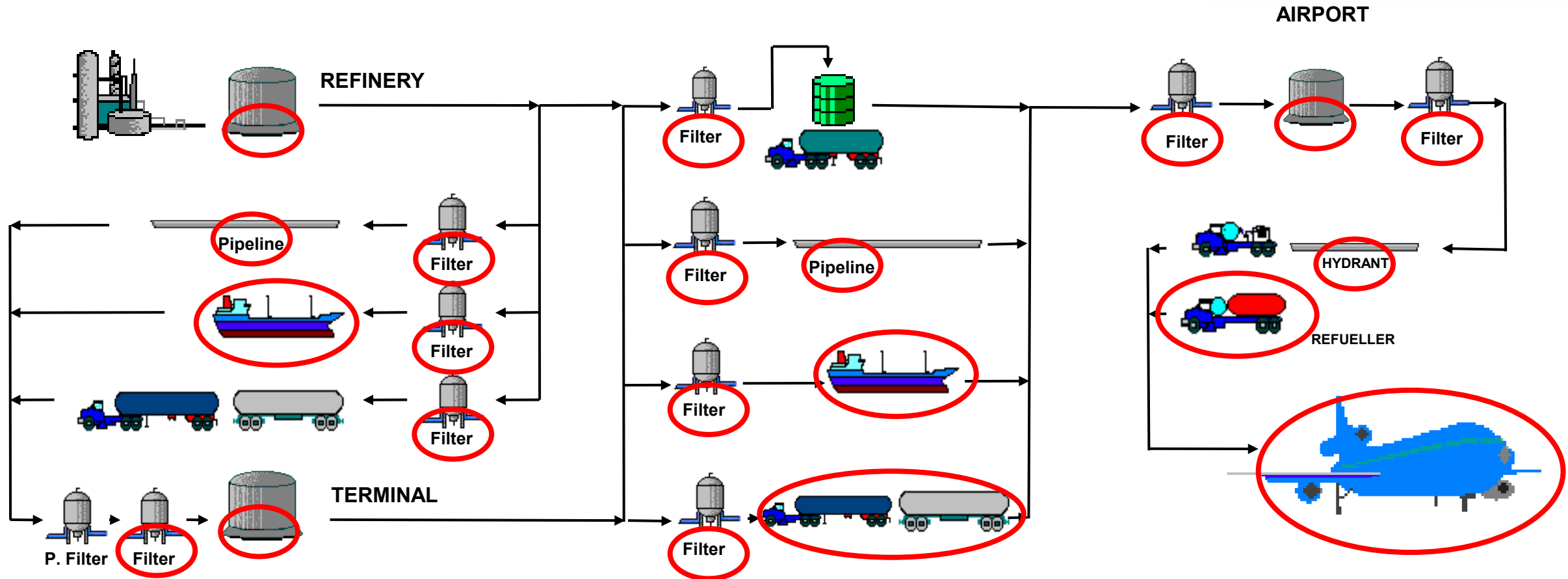
Temperature / Climate

- Microbes prefer warm conditions; 20 – 35°C (68 - 95°F);
- Growth occurs at temperatures down to c. 4°C but it will be slower.
 - Seasonal influence on microbial growth in storage tanks.
 - More problems in hot humid climates.
 - Temperature fluctuations promote water condensation.
 - Microbial growth will only occur in aircraft tanks during “ground time” - temperatures in flight are far too cold for growth.
 - Aircraft with prolonged ground time and/or on short haul operations are more prone to growth.

Climate and Microbial Growth

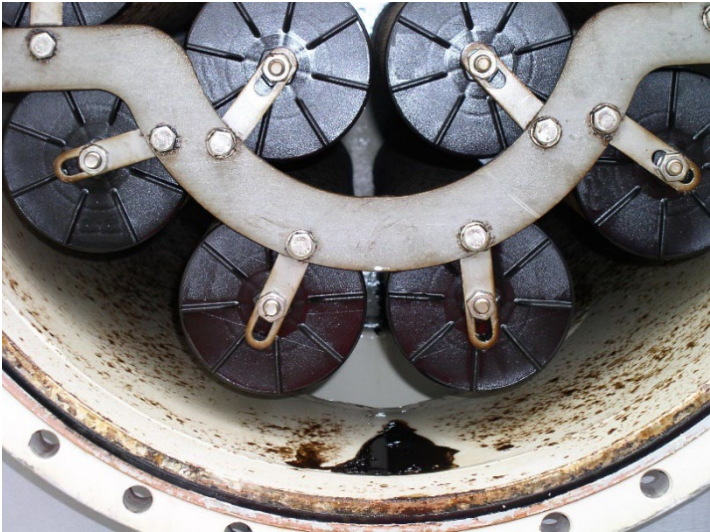


Fuel supply cleanliness



Attention needed from refinery to wing!

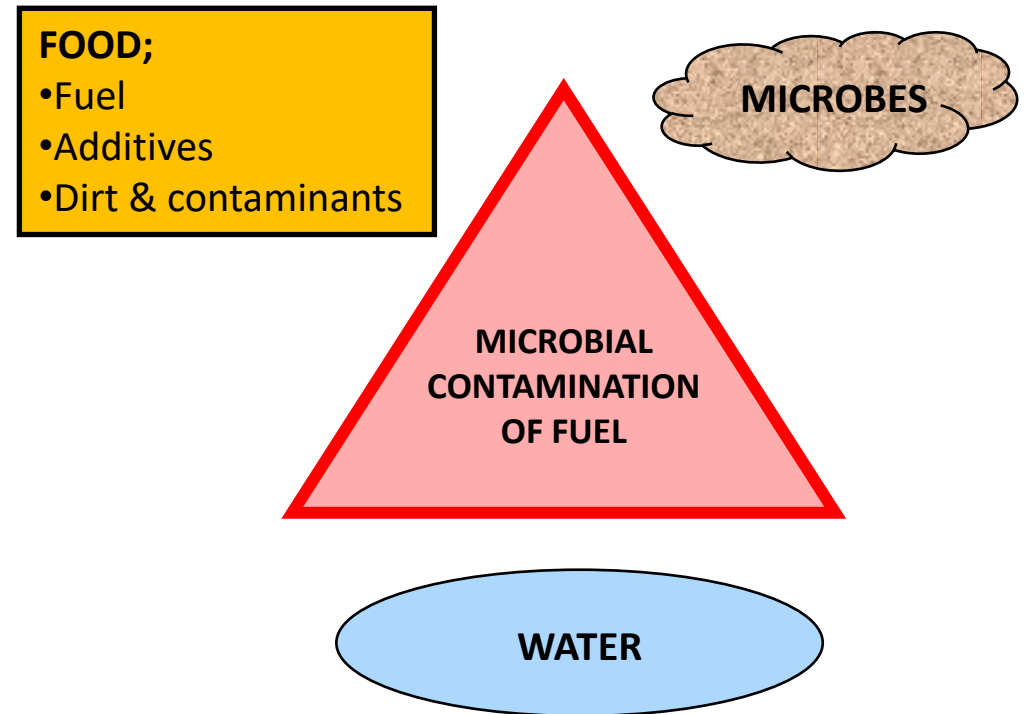
Microbial growth in the supply and distribution of aviation fuel



Filter Water Separators

Summary

- Water is the key risk factor for MBG.
- All locations are at risk but higher risk for tropical areas.
- Microbial growth can occur at any stage in the supply and distribution of aviation fuel.



Get In Touch

Tel: +44 (0)29 2036 5930

E-mail: info@echamicrobiology.com

Web: www.echamicrobiology.com

Registered Office: ECHA Microbiology Ltd, Units 22-23 Willowbrook Technology Park, Cardiff, CF3 0EF, UK

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