



# OLI simulation technology

**For Pratt & Whitney**

17 May 2019

**think simulation**

**getting the chemistry right**

# Discussion outline

Introductions

Simulation to address chemistry / corrosion questions

A closer look at the software

OLI access

# Individual introductions



## Individual introductions

Your group

Your simulation interest

### What are your biggest water chemistry challenges?

- ✓ Know whether scaling will occur?
- ✓ Simulate your process to find corrosion problems?
- ✓ Maximize water re-use?
- ✓ Optimize your water-based process?
- ?

& introducing OLI Systems ...

# OLI Systems: Proven water chemistry leadership



**A unique combination of capabilities**

Physical property modeling

Electrolyte Property database

Simulation software

**A unique group of professionals**



**Most comprehensive electrolyte chemistry based solutions**

**Sustained innovation research & development**

**Think simulation!  
Getting the chemistry right**

**Expertise and resources**

**Global recognition**

# OLI simulation modeling benefits

**Reduce and focus lab testing** ruling out what is infeasible

**Anticipate changes** before they occur: “what-if T, P, pH trends towards...”

**Model system complexity** with thermodynamic accuracy

**Compare alternatives** when looking for optimal performance

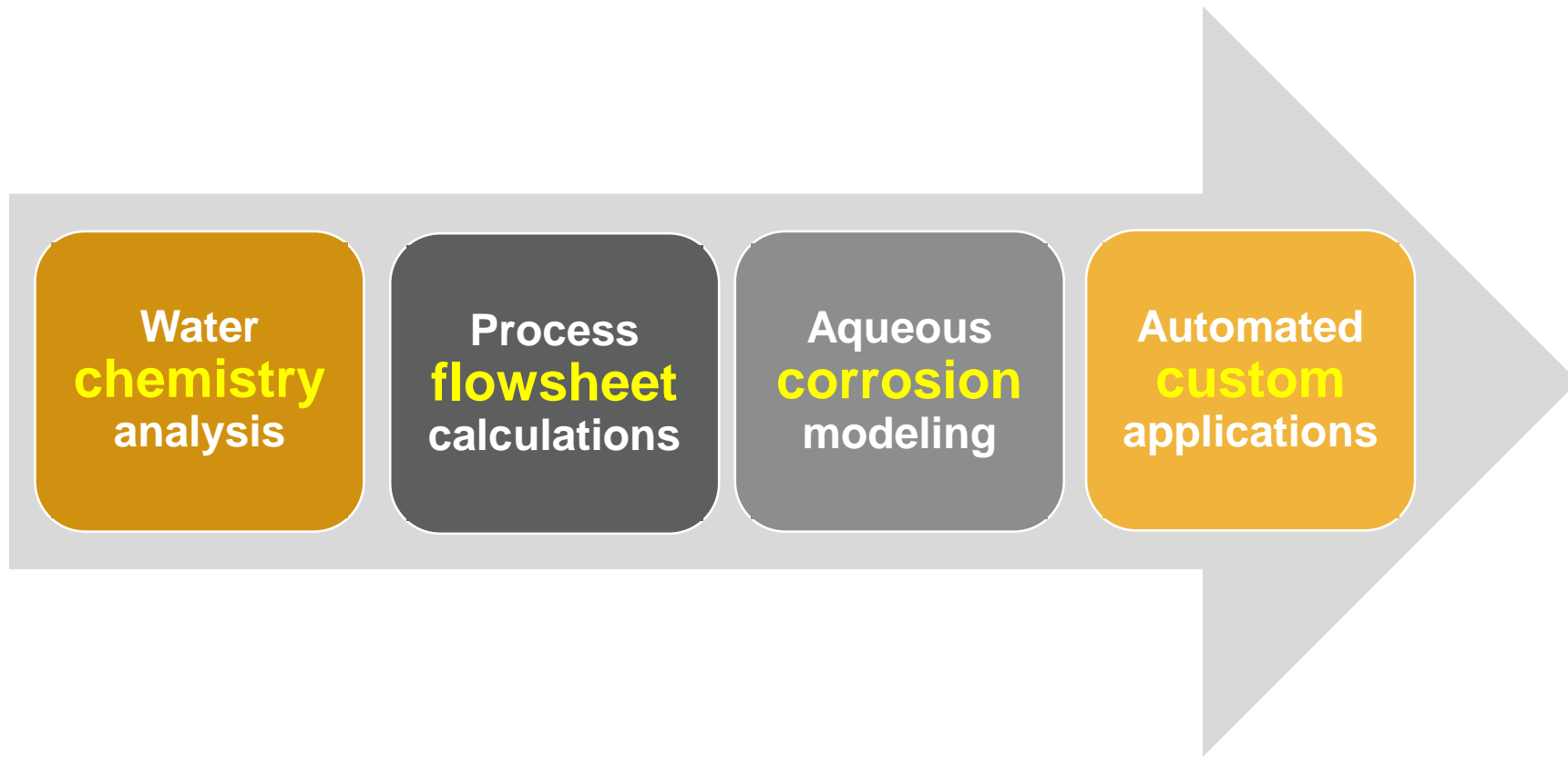
**Identify bottlenecks** that could limit yield, cost savings

**Gain confidence in decisions** when backed by thermodynamics

**Study regulatory limits** and what is needed to meet them

**Evaluate** operational, environmental impact ahead of making changes

# OLI technology brings competitive edge



# Water chemistry analysis

OLI Studio  
Stream  
Analyzer

or

ScaleChem

**Equilibrium based**  
Solid-liquid-vapor-organic phase distribution

**Multi-component systems**  
Physical & chemical property calculations

- Advanced mechanisms**
- Kinetics framework
  - Reduction / oxidation
  - Mass transfer
  - Surface reactions

- Advanced properties**
- ORP
  - Water activity
  - Transport properties
  - Osmotic pressure, etc.

# Aqueous corrosion simulation

## OLI Studio: Corrosion Analyzer

### Thermodynamics of corrosion

Real-solution Pourbaix  
diagrams, taking all ion-ion  
interactions into account

### Uniform (general) corrosion rate

Computer-generated  
polarization curves &  
underlying, diffusion limited  
anodic & cathodic reactions

### Localized corrosion

Corrosion potential vs  
repassivation potential,  
calculating the worst-case  
pitting rate

### Remaining asset life

Given time, pit depth, area,  
a statistical model that  
calculates time to failure



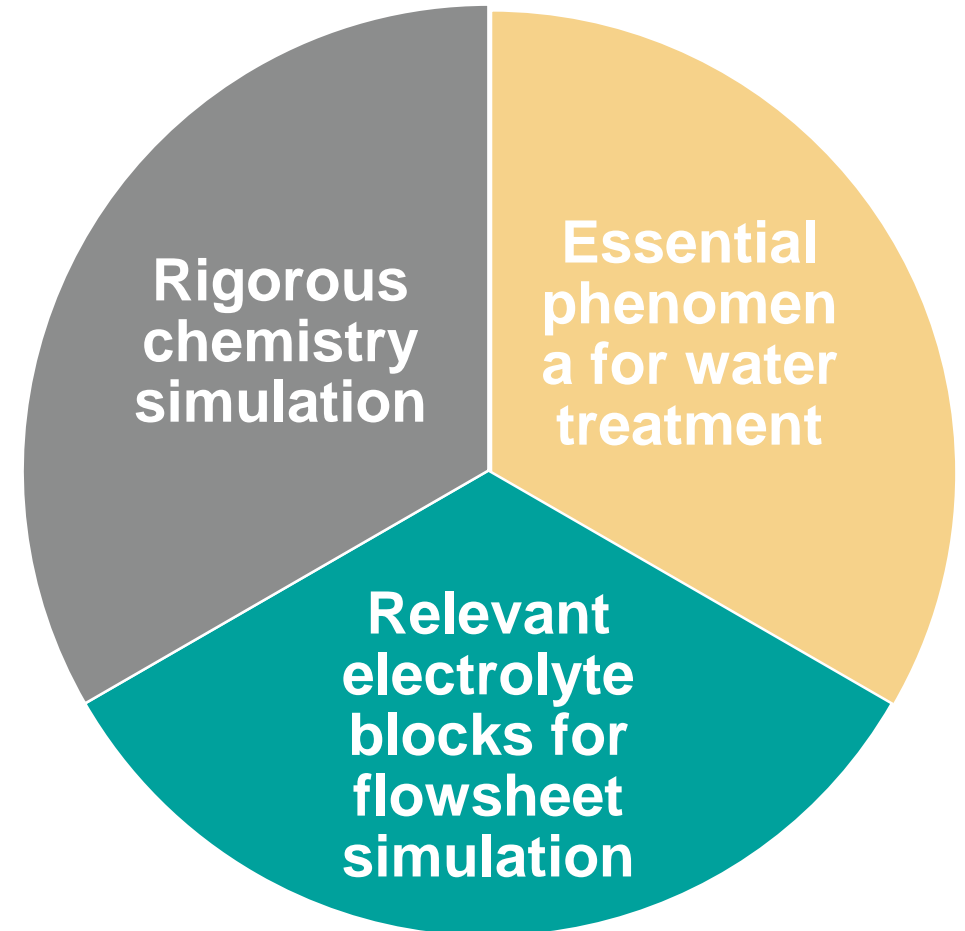
# Process **flowsheet** simulation

## **OLI Flowsheet: ESP**

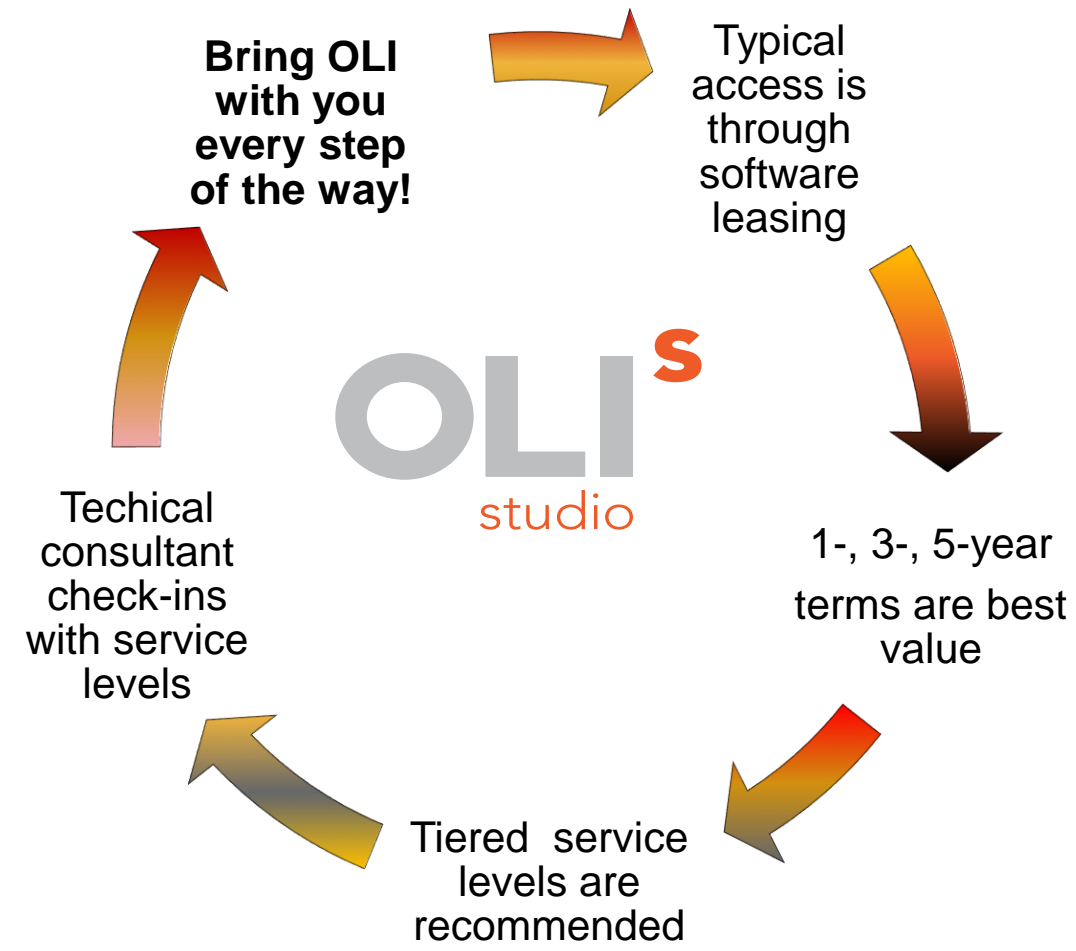
### **When electrolytes are primary**

#### **OLI Flowsheet: ESP**

- **Multiple units, recycle**
- **Fullest implementation of OLI technology (kinetics, ion exchange)**
- **Reverse osmosis unit**
- **Target: industrial water treatment**



# Working with OLI



# Service levels to ensure your success!

Combining training, support, consulting, data validation bundles



Bronze

## LIMITED

Installation,  
Configuration,  
Break-fix and Bugs

Included



Silver

## STANDARD

For building  
confidence  
in your electrolyte  
simulation work



Gold

## PREMIUM

When you want  
and need  
mission-critical  
success  
in your work














Platinum

## SUPERIOR

OLI onsite  
training and  
consulting to  
ensure your  
success

Pre-paid Service Levels

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