



Flow Assurance: State of the Art

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Gerry Elphingstone

Tahiti Start-Up Engineer: Subsea & Flow Assurance



What exactly is "State of the Art"



One View of Flow Assurance



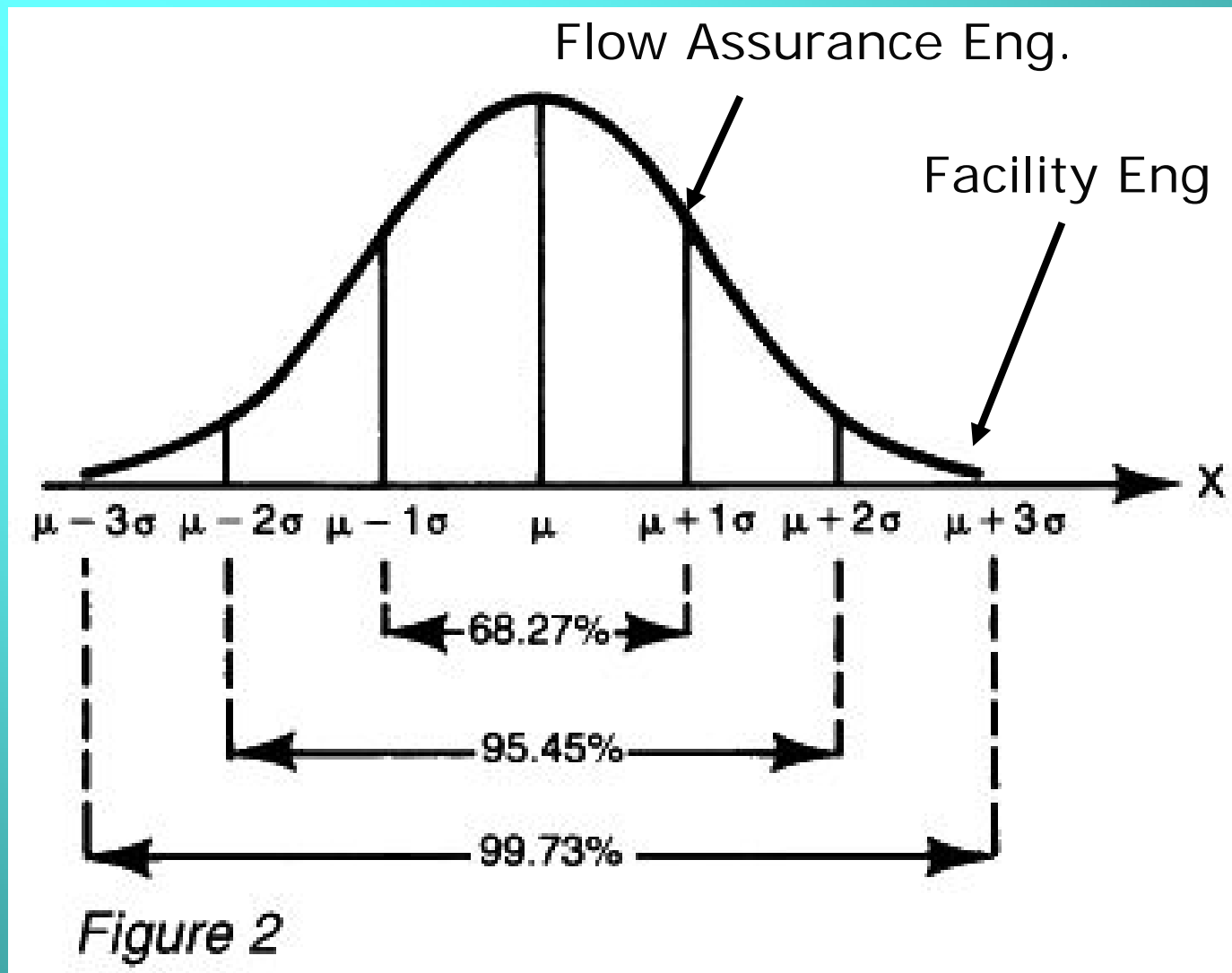


One View of Flow Assurance



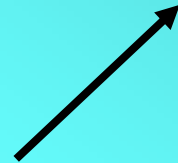
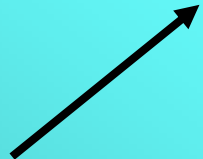
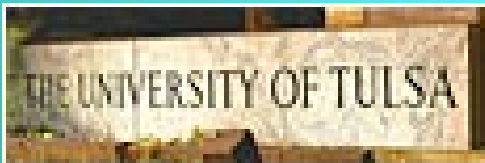


Flow Assurance Risk





Communication!





State of the Art

- How are you helping to eliminate risk?
 - » Better definition of the problem?
 - » Better understanding of the uncertainties?
- Enabling technologies?
- Pushing boundaries?



Examples

- Thermal insulation for hydrate/wax mitigation
 - » What about cold spots? There's a lot!
 - » Insulation failures
- What about well start-up?
 - » Do I even need to insulate a tree?
 - » Ramp up times? Fast? Slow?
- Does my remediation strategy even work?
 - » Is there an easier, faster, cheaper way to do it?
- Do I really need to pig? Very risky!



State of the Art

- Applications of Technology
- Hydrates
- Wax
- Asphaltenes
- Napthenates
- Emulsions & Foaming
- PVT
- Multiphase Flow
- Well Testing & Metering
- Materials & Corrosion
- Reservoir Souring
- Scale
- Water Management