What’s New in 2019 R2
Screen Icing with Multi-Shot

Availability of screen icing model in quasi-steady multi-shot simulations

- Ice build-up on screen wires analogous to wall icing and roughness build-up
- Fully unsteady option remains possible

Benefits

- Efficient simulation strategy for long simulation times to be used for modeling ice build-up on screens
- Air flow solutions can be calculated with FENSAP or Fluent

Simulation showing increasing losses of $P_{\text{total}}$ over time as ice accretes on the wires of a screen covering an engine intake.
Improved Usability for Icing Re-Meshing

Further integration of Fluent Meshing for grid displacement in multi-shot simulations

• Direct GUI access to settings
• Management of underlying script files

Benefit

• Streamlined workflow
• Directly enter mesh sizes and controls
• No need for external editors

GUI access to settings for remeshing with Fluent Meshing, which provides for a highly automated process of meshing complex ice shapes, such as shown for the swept wing example above
Multi-shot after CHT or with Heated Walls

Ability to predict ice shapes using quasi-steady multi-shot approach based on preceding anti-icing simulations with CHT or defined heat fluxes

- Drag-and-drop connection in project manager
- Use of FENSAP or Fluent as air flow solvers
- Full flexibility in re-meshing options

Benefits

- Direct and easy application of wall temperatures and heat fluxes from CHT simulation
- Additional simulation fidelity

CHT simulation results of a piccolo tube system (above) used in subsequent multi-shot simulation of ice formation (below)

Multi-shot simulation results of a heated upper surface wing
Improved Usability for SLD Re-injection Simulations

Automate grouping of re-injected particles
• Considers all walls of the domain

Benefits:
• Simplified set-up
  • No need to specify walls for re-injection
• Reduced computational effort
  • More efficient grouping of walls

LWC Contours of secondary droplet simulations

Re-injection increases Collection Efficiency on the windshield

Graph showing Collection Efficiency on the windshield for different scenarios.
Additional Enhancements

- Generalization of turbo mixing plane interfaces for engine icing
  - Simulate turbo blade rows in combination with non-axisymmetric nacelle intakes at different angles of attack
- Ability to specify partially melted crystals at inlets
- Solution speed-up for EID calculations in multi-row turbomachinery

Please see release notes for full details and a complete list of all enhancements