Advanced Training in Residual Stress (SRS/BRS) Modules

<u>Objectives</u>:

1) Understand what is the difference between residual stress and what we are applying as an initial stress (or eigenstrain) load.
2) How to create boundary layer meshes.
3) Understand the different methods for assigning SRS loads, and things to watch out for.
4) Understand the different methods for assigning BRS loads.
5) Understand how to compute distortion and extract residual stress after loading a problem with SRS and BRS loads.

Session I   **SRS Module**

❑ Lecture: "Residual Stress: Subsurface Residual Stress (SRS) Loads".

❑ Exercise: Solve model problem #1 demonstrating symmetry constraints, boundary layer meshing, and surface intersection issues.

❑ Exercise: Solve model problem #2 and compare residual stresses to published experimental results.

❑ Exercise: Solve model problem #3 demonstrating arbitrary line extractions of stress, and compare residual stresses to published experimental results.

❑ Exercise: Solve model problem #4 demonstrating prediction of distortion using SRS profiles, and several ways to assign SRS profiles.

Session II   **BRS Module**

❑ Lecture: "Residual Stress: Bulk Residual Stress (BRS) Loads".

❑ Exercise: Solve model problem #1 demonstrating BRS loads with an imported residual stress solution.

❑ Exercise: Solve model problem #2 demonstrating spatial formula BRS loads.

❑ Exercise: Solve model problem #3 which combines BRS and SRS loads, using SRS loads to cancel out distortion caused by BRS loads.