NLIGN ANALYTICS

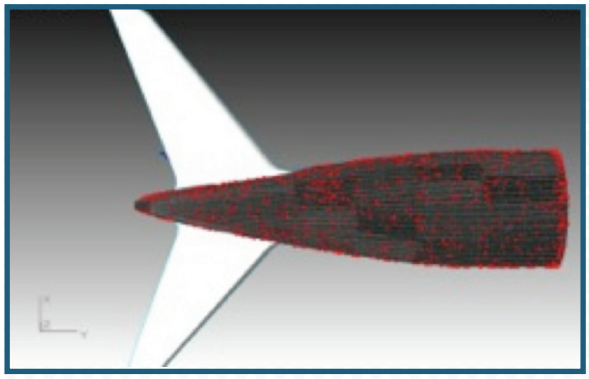
Revealing the Cause of Tool-Related Porosity with NLign

PROBLEM:

Porosity problems were plaguing a major composite aerostructure program, creating rework and scrap losses costing millions of dollars.

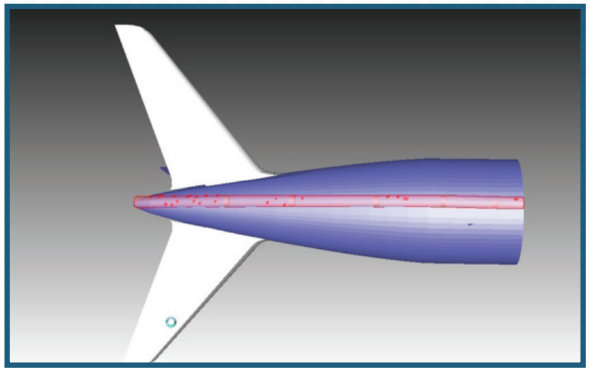
WHAT NLIGN PROVIDES:

Porosity problems can often be traced to tooling flaws, like vacuum leaks associated with tool seams or thermocouples. Patterns in porosity indications that indicated these problems can be difficult to detect. The combination of multiple inspectors, multiple tool sets, and multiple possible locations leads to a situation where it is nearly impossible to rely on inspectors to identify the pattern from individual scans, until it is too late to resolve the problem. This causes excessive scrap. NLign solves this problem by aggregating all of the inspection findings and visualizing them in one 3D view. In addition, NLign allows the user to define spatial filters that can "watch" specific areas on the molds and report selected adverse findings.



Step 1: NLign quickly aligns hundreds of UT scans to a model of the fuselage, aggregating data from multiple fuselage sections in seconds.

In this case, NLign automatically aggregated and aligned hundreds of individual UT scans with inspection annotations for several production fuselage components on a 3-D geometric model of the fuselage. Then, the NLign user created a tube-shaped filter along a tooling seam to highlight inspectopin indications in this critical area.



Step 2: A spatial filter is defined and applied to the 3-D model.

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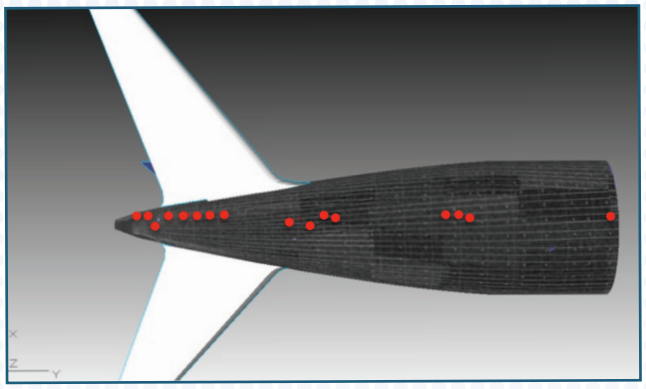
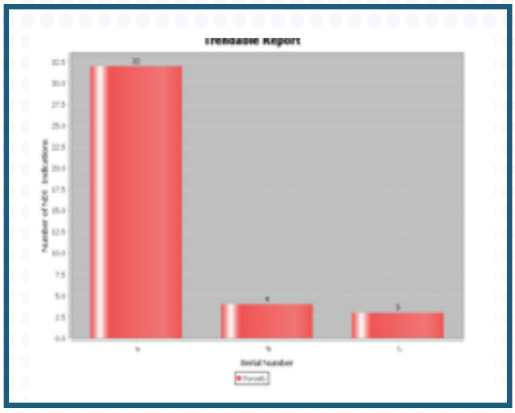
Next, the user created another filter to display only porosity indications within the previously created spatial filter. When this filter was applied data and annotations, a pattern of porosity problems became apparent on the 3D model.



A detailed report was then generated, illustrating the porosity indications as a function of mold tool set. This report clearly showed that the majority of porosity problems along the problem seam were associated with one particular tool set.

Step 4: A detailed report of porosity along the mold seam identifies a single tool set as the culprit.



THE RESULT:

Inspection of the seals associated with the identified mold set verified the problem. After repairing the seal the number of porosity problems substantially decreased.

SOLUTION:

By fusing multiple inspection data sets with 3-D models, filtering the data by position on the structure and type of indication, then identifying the flawed tool set, NLign's user eliminated a recurring porosity problem and prevented millions of dollars in future scrap costs. NLign's proven ability to aid rapid root cause analysis makes it a valuable tool for the discovery of costly process-related defects.

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