

Aircraft Hydraulic Flushing Improvement using CFD Modelling

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BACKGROUND

The hydraulic system on the aircraft wings undergo flushing as part of its manufacturing build process. The current flushing process is suspected to be inefficient as some of the flushing circuit may not have achieved the optimised flow condition.

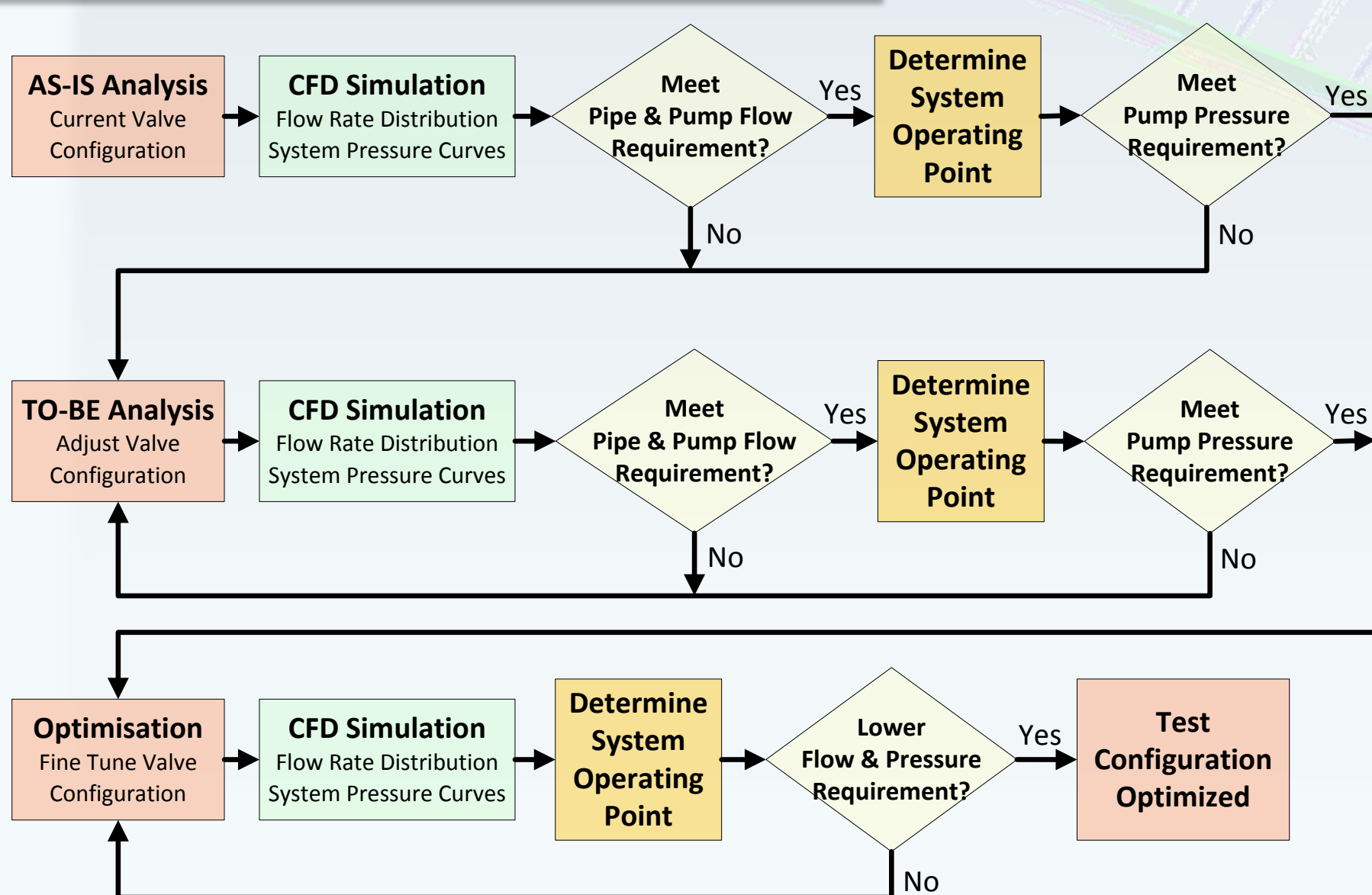
AIM & OBJECTIVES

AIM: To investigate the effectiveness of the current flushing operation on the aircraft wings and provide recommendations to improve it.

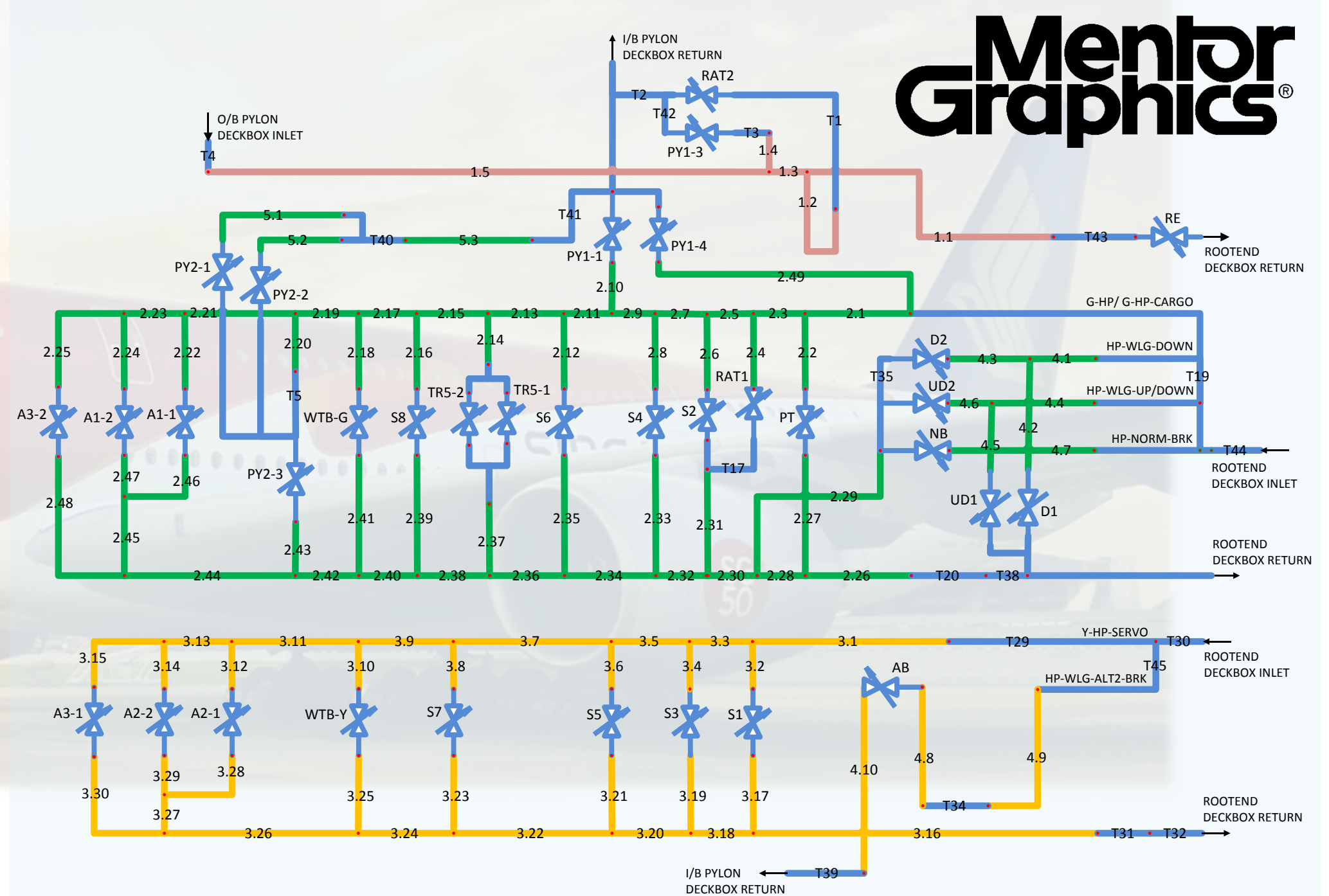
OBJECTIVES:

- Verify performance of the current flushing process using CFD modelling method.
- Determine flow rates for effective flushing.
- Provide recommendations from results.
- Review current flushing process to identify any other areas for improvement.

METHODOLOGY



MODELLING & SIMULATION



Aircraft hydraulic system including test tooling kit was modelled using Flowmaster V7.

RESULTS:

- Some of the flush circuits did not meet the required flow rate to ensure turbulent flow.
- Pressure drop of certain flush circuits exceeded the design operating pressure of the test rig.
- Contamination sampling with parallel flow paths resulted in unequal flow distribution.

CONCLUSION

The project concluded that the current hydraulic flushing process is inefficient and identified several potential improvements.

A review on the current hydraulic flushing process was completed with recommendations to improve on the overall effectiveness and quality of testing.