

ROBOTIC BRAZING LINE USING FACTORY SIMULATION ENGINEER

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ABSTRACT

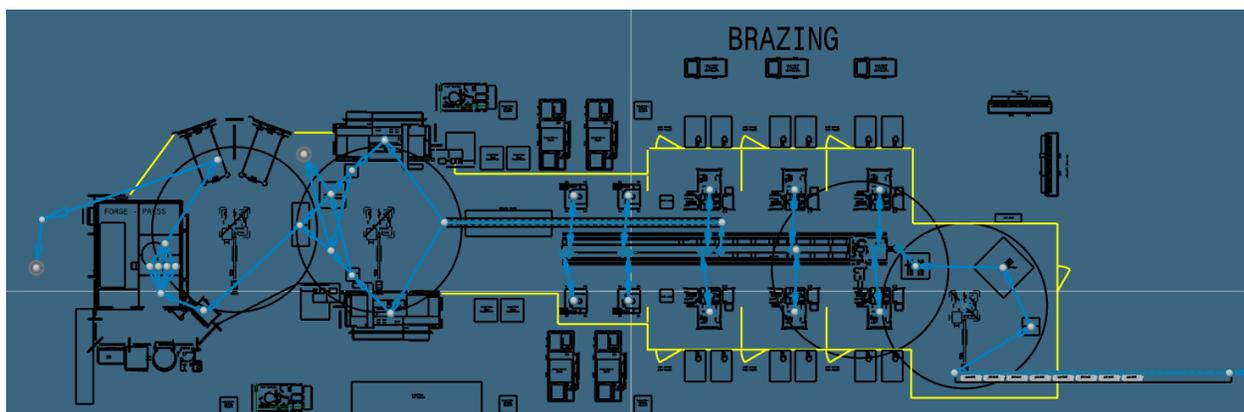
TriMech developed a model in conjunction with a manufacturing client to evaluate a robotic brazing line against production targets across an order of magnitude. The focus of the study was how a 7th axis material handling robot could prioritize tasks for different production schedules and if the line could support the highest production target. In this presentation the process changes, input data, modelling methods, and results of the study will be covered. A virtual twin of the brazing line was developed using Dassault's Factory Flow Simulation software solution. This model will be shown as a part of the presentation.

INTRODUCTION

The focus of this paper is the application of the Factory Flow Simulation software to evaluate a brazing line designed by an integrator. At the center of the system studied is a 7th axis material handling robot. The robot is responsible for product flow in and out of six automated brazers and four automated heaters. The robot picks from a single-slot hand-off station on the extreme end of its reach to inbound parts, and places onto a conveyor from between the brazers and heaters on the outbound.

The model was experimented upon with two objectives. First, to validate that the line could produce parts at the planned maximum production capacity. Second, to identify the order in which brazers and or heaters should be shut down when lower throughput is needed. Ten initial experiments were conducted to validate the behavior of each heater and brazer independently. After validating the behavior of the stations further experiments were carried out to model the demand scenarios scaling from 2,000 to 20,000 parts per month. The results of this model were used by the customer to negotiate required changes to the design with their integrator.

In addition to the model, custom training was also developed for and delivered to the customer. The training educated on how to use the software at a basic level. Met with strong reviews, it enabled the customer to iterate on the simulation provided.



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Figure 1: Top View of the customer provided CAD layout and the product flow.