



# Sensitivity analysis with simulation aids facility design.

The perfect time to answer all those “what-if” questions is before you put a single machine in place. This simulation-based project provided the confidence to pursue a specific facility design strategy.

## The Customer

A leading manufacturer of welded and cold drawn mechanical steel tubing and tubular shapes

## The Challenge

IET’s customer had the opportunity to expand its business by incorporating fabrication work with tube cutting operations in a new facility. The fabrication work required welding and machining equipment that had to be configured with sufficient buffer space to accommodate the uncertainties in projected volumes and schedules. Once the machines were in place, they could not be moved without jeopardizing on-time customer deliveries.

## The Solutions

The customer knew they would have to start-up with a pre-defined equipment list. Therefore, the first key issue to resolve was capacity. IET evaluated several different production control strategies for their effect on constraint equipment loading. The principal parameters in this analysis were batch size and product grouping options. The analysis yielded a production control strategy that provided sufficient capacity to handle uncertainty.

IET also created a discrete-event simulation to model the chosen production control strategy and its effect on buffer sizes given the various products and routings. At this point, sensitivity analysis was employed to assess the consequences of volume increases ranging from 10% to 20% depending on products’ ABC classification. As expected, maximum buffer sizes varied depending on the product mix defined for each scenario.

The client based their design decision on the sensitivity analysis scenario that gave them a “comfort zone” given the uncertainties that surrounded the new business. Buffer sizes associated with the particular scenario became the planning standard for locating fabrication equipment in the new facility. Once this phase of the project was completed, detailed implementation planning began in earnest.

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Vertical integration

Horizontal integration