



Proposed Simulation of Work-In-Process Area

PROJECT SUMMARY

This project was an ARENA simulation of a proposed work-in-process area of a major video products manufacturing plant. The work-in-process (WIP) area simulation included an input conveyor leading to the WIP area, the WIP area itself, and two output conveyors from the WIP area to the finishing lines. The simulation showed that throughput could be achieved with all five picture tube sizes. When the simulation showed that one product could not be sent to the WIP area, while another product was being taken from the WIP area, the WIP process was changed.

SYSTEM DESCRIPTION

Machined and polished television picture tubes enter the work-in-process area on one conveyor line that is composed of roller and belt conveyors. The picture tubes can be removed from the conveyor and placed into work-in-process storage, or allowed to go directly to the finishing lines. If the input rate of the tubes is faster than the finishing lines will accept, the finishing lines are kept filled and the additional tubes are put into WIP. Later, when the upstream process is being changed to another product, the picture tubes placed into WIP are brought out to keep the downstream processes going. The system needs the capability to place one product into WIP while another product is being taken from WIP so that all of a product type can be removed from WIP when the upstream process is changed to another product more quickly than expected. Picture tubes leave WIP and go to the finishing lines on one conveyor line that is composed of roller and belt conveyors.

OPPORTUNITY

The objectives of the study include:

1. Determine if the proposed design of the WIP area will process the increased production rate.
2. Determine if there is enough buffering in the roller conveyors leading to the WIP area when a pallet is full in the WIP area and needs to be changed.
3. Determine if there is enough buffering in the conveyors leading from the WIP area when a pallet is empty in the WIP area and needs to be changed,
4. Determine if one product can be taken into WIP while another product is being removed from WIP.

APPROACH

Five different picture tube sizes, each having different throughput rates and packing times, will be processed within the system. The design will achieve the desired throughput for all five picture tube sizes if one size picture tube could be put into the WIP area while another size product was sent from the WIP area to the finishing lines.

SOLUTION

The proposed design of the work-in-process area was simulated with Arena. The input rate and packing time for the picture tubes were defined as system variables, so that all the products could be tested without changing the simulation model. The simulation determined that the desired throughput rate would be achieved with all picture tubes. However, one product could not be taken into WIP while another product was being removed from WIP. The process for taking product out of WIP was changed to allow simultaneous movement.