Introduction

• The goal of my work is to automate different projects and processes within CCM in order to increase efficiency and remove human error.
  • So far, I have been able to do so with the I-Wrap and Fast Manufacturing Cell Programs.

Objective

• I-Wrap
  • Build reinforced composite structure within a pipe
  • Seal leaks
  • Withstand stress strains
• Fast Mold Manufacturing Cell
  • Reduce cycle time
  • Reduce human error
  • Dramatically reduce cost

I-Wrap

• Preform
  • Expansion in pipe
  • Transportable
  • Strong quality of material
  • Handle stress strain of pipe
• Expander
  • Robot pulled through
  • Apply pressure to expand
• Winder Rehabilitation
  • New PLC and Servo Drives
• PLC Programming
  • Click
• Servo Drives Manually Configured
• Modbus RS485 general communications
• HMI
  • Designed using C-more
  • Modbus RS232 communications
  • Direct connection
• Automated layup to create feedstock
  • Mandrel design

Fast Mold Manufacturing

• Fast Homogenous heating
  • IR bulbs
  • Non-contact temp sensors
  • IR camera
• Press molding
  • Controlled heating and cooling
  • Process development (temperature and pressure)
• Winder Rehabilitation
  • New PLC and Servo Drives
• PLC Programming
  • Click
• Servo Drives Manually Configured
• Modbus RS485 general communications
• HMI
  • Designed using C-more
  • Modbus RS232 communications
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• Automated layup to create feedstock
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Next Steps

• I-Wrap Program
  • Material properties
  • Layup
  • Transportable
  • Expander
• Fast Mold Manufacturing Cell
  • Molds with embedded closed loop heating and cooling
  • Reduce cycle time

Conclusion

• Automation is important because:
  • Reduce cycle time
  • Reduce costs
  • Reduce human error
  • Reduce risk
• Knowledge and Experience Gained:
  • Electrical and wiring experience
  • Extensive CAD experience
  • Programming Experience
  • Machining experience
  • General hands-on experience

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