OPPORTUNITIES TO EXPAND MARKETS WITH TECHNOLOGY
TECHNOLOGY

“I SKATE TO WHERE THE PUCK IS GOING TO BE, NOT TO WHERE IT HAS BEEN”

- WAYNE GRETZKY
ROBOTIC WELDING
ADVANTAGES OF ROBOTIC WELDING

- Speed
- Accuracy
- Consistency
- Quality
- Operator Safety
- Overall Cost Reduction

2 Bay Robotic Welding Cell
ROBOTIC WELDING
SPEED

• Human Welders – Typically less than 50% arc-on time
• Robotic Welders – Typically average 75%-80% arc-on time
  • Arc-on time can increased to as much 95% for parts with longer seams
• Robotic Welders can weld with faster travel speeds (which can also reduce warpage)
ROBOTIC WELDING
ACCURACY AND CONSISTENCY

- Automated system creates consistent weldments with a high level of accuracy
- Same weld, Same place, Every time
- This does not completely eliminate mistakes and defects
  - Malfunctioning or damaged equipment, incorrect programming or misaligned materials can still result in product defects
ROBOTIC WELDING

QUALITY

- Better control of welding variables produces higher quality welds
  - Modes of transfer
  - Weld hotter and faster
  - Use of larger diameter wires (less expensive)
ROBOTIC WELDING
FIXTURING
ROBOTIC WELDING
ROBOTIC WELDING PROGRAMMING

- Can be programmed at the machine or from an office computer
- Easily done at the machine
- Programmer must understand the science of welding
- SMART members are best positioned to program and operate Robotic Welders
ROBOTIC WELD CLEANING
ROBOTIC TOTAL STATIONS

- Why use a Robotic Total Station?
  - Speed
  - Accuracy
  - Productivity
  - Inaccessibility
  - Value/ROI
AUTODESK SOFTWARE

- Autodesk Software Applications
  - AutoCAD
  - Revit
  - Navisworks
  - Fabrication CADmep
  - Fabrication CAMduct
  - And more
ADDITIONAL SOFTWARE

• Software Applications
  • Bluebeam
  • PlanGrid
  • Stratus
  • eVolveMEP
  • DADO
  • Procore
  • Many others
Why use a 3D Laser Scanner?
- Speed
- Accuracy
- Schedule
- Verification
- Value/ROI
FUTURE OF 3D LASER SCANNERS
MOBILE DEVICES

- Why use mobile devices?
  - Accessibility
  - Speed
  - Real-time Collaboration
  - Cost
  - Efficiency
3D PRINTERS

- Ability to print smaller scale parts
  - Examples:
    - Nuts, bolts and washers
    - Ductmate Corners
    - TDC Clips
    - Prototypes
    - Etc.
3D PRINTERS
AUTOMATED SHOP EQUIPMENT

- TigerStop
  - Automates processes
  - Fast and accurate cutting
  - Reduces waste
  - Improves productivity
  - Attaches to existing equipment
VIRTUAL REALITY LIFT

- VR Mobile Elevated Work Platform (MEWP)
  - Safe Operation
  - Efficient Operation
  - Proficient Operation
  - Train new operators
  - Assess operators
  - Remediate experienced operators
  - International Powered Access Federation (IPAF) approved use for recertification
VIRTUAL REALITY WELDER

- Speeds up learning process
- Pre-training assessment
- Remediation
- Reinforces welding principles
- Real time analytics (not subjective)
- Reduces cost for training
- Teaches use of WPS
HOLOLENS

- Trimble XR10 with HoloLens 2
- Field of View
- Communication
- Wearability
- Easy to Use
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