

# Training: Bridging The Skills Gap

Presented by:  
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Managing Director  
Key Process Innovations

## A Little Background

- Over 13 years of experience in Precision Investment Casting Industry
- BSE in Chemical Engineering
- Member of Board of Directors for Investment Casting Institute
- Investment Casting Institute's Process Control Class Instructor
- Focused on improving process efficiency

# Overview

- Overview of Hiring Climate
- Benefits of Investing in Operator Training
- Elements of a Training Program
- Case Study
- Protecting the Process

# Shortage of Skills Labor

- In the US, University of Massachusetts Medical School reported businesses losing 10 percent of its employees over 50 years of age every year
- In 2013, 4 out of 10 European employers reported challenges finding employees with the right skills<sup>1</sup>
- 81% of all Japanese firms reporting having difficulties filling jobs in 2014<sup>2</sup>
- In the UK, 1 in 5 of all vacancies in 2013 are a result of skill shortage vacancies, up from 1 in 6 in 2011<sup>3</sup>

# Which Positions are Hardest to Fill?

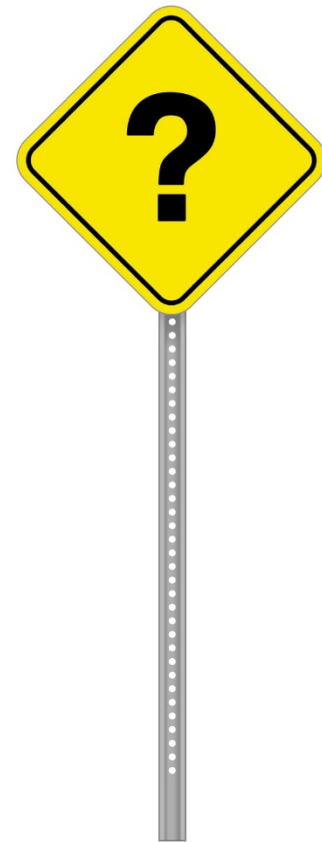
According the 2015 Manpower Group report the positions the hardest to fill are:

1. Skills Trade Workers
2. Sales Representations
3. Engineers
4. Technicians
5. ...
10. Production/Machine Operations

# Why Can't These Positions Be Filled?

Top Key Reasons for Difficult Filling Jobs are:<sup>4</sup>

- Lack of Available Applicants
- Lack of Technical Competencies
- Lack of Workplace Competencies
- Lack of Experience



## So What Does That Mean?

- Employees may not have industry experience
- Employees may not have manufacturing experience
- Employees may be new to the workforce

**A Robust Training Program is Critical  
for Business Success!**

# Benefits of Training

- Safer work environment
- Clean work area
- Engaged Employees
- Lower employee turnover
- Reduced scrap/rework
- Better flow through the plant
- Improved on-time delivery
- Increased profitability



# Why Most Employers Don't Have Robust Training

- Expensive
- High EE turnover reduces ROI
- Perception that it will take too much time
- Long term strategy that may impact short term results
- Overwhelming Task
- Not sure where to start

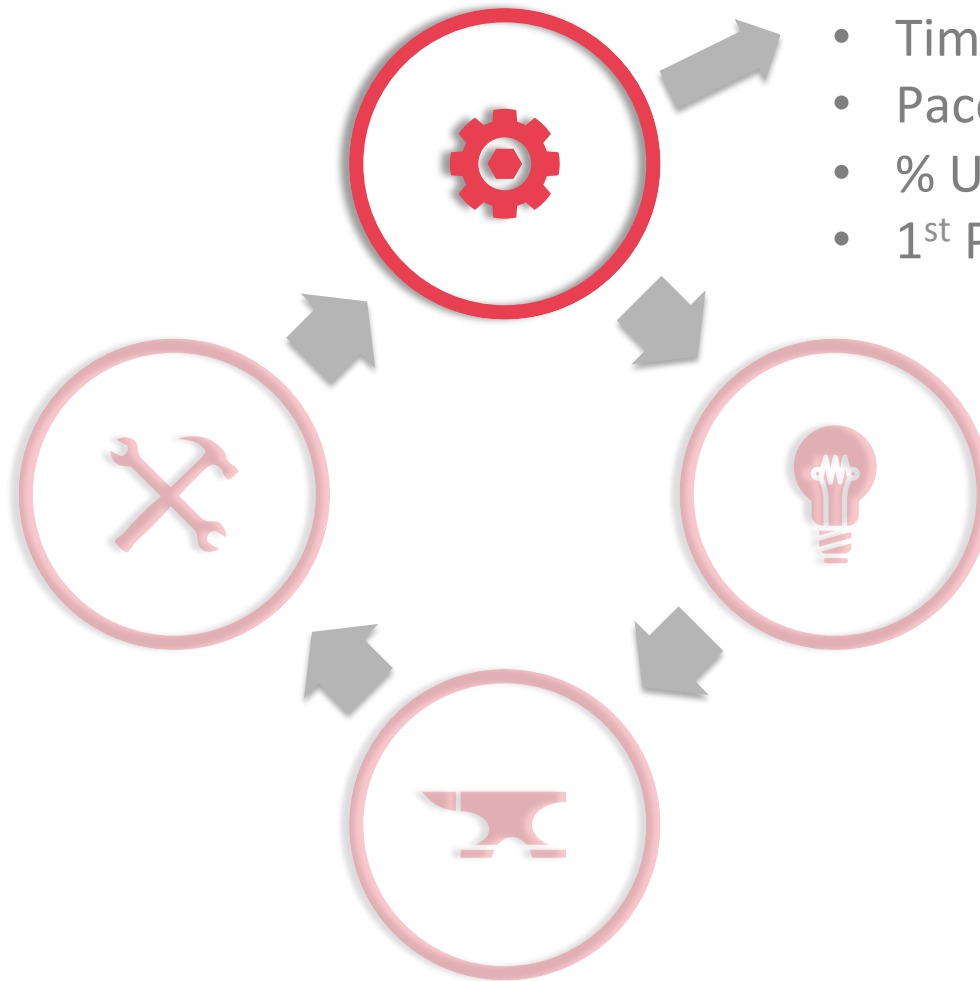
# KPI-Thrive™ Training Cycle



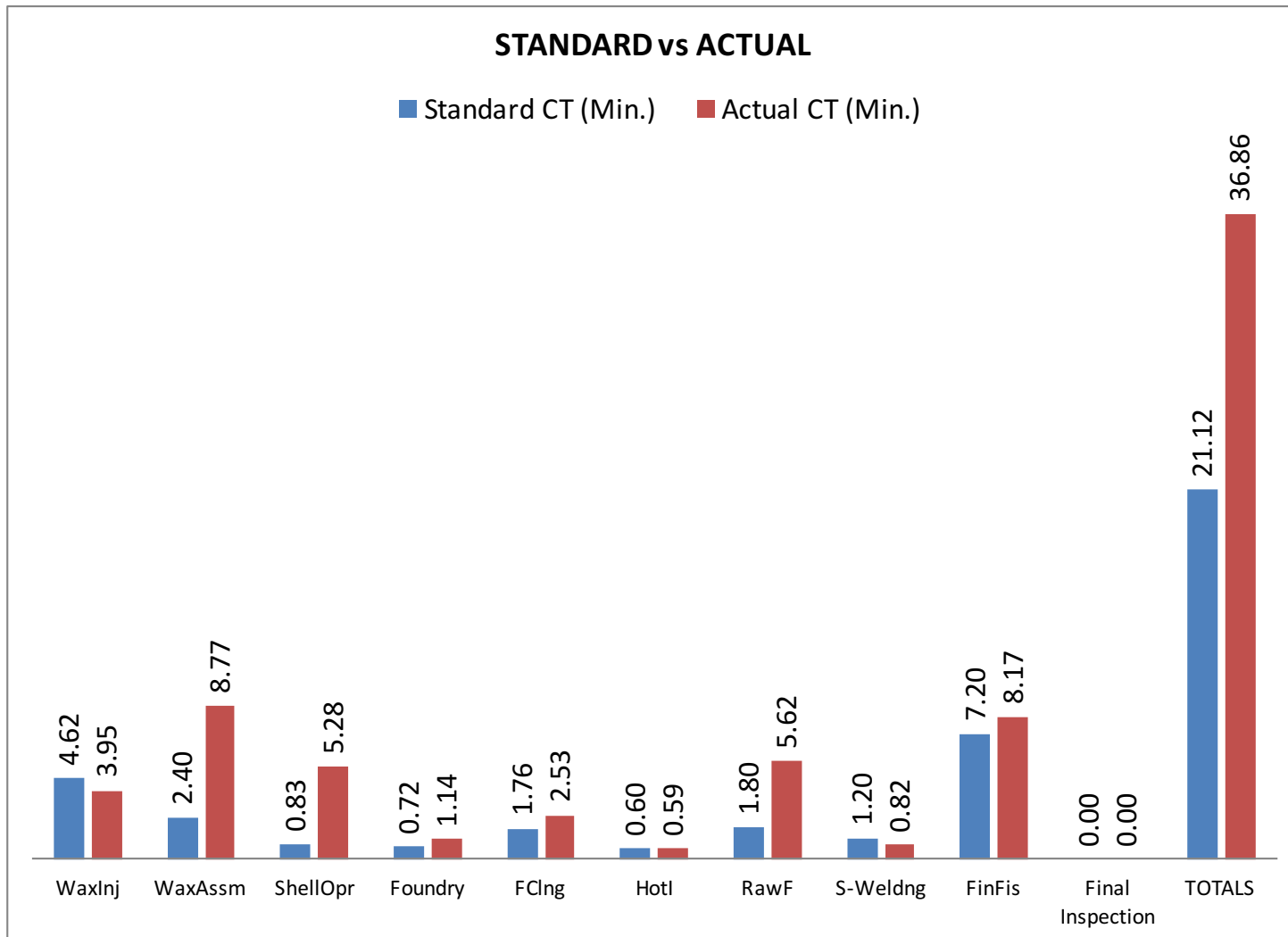
# KPI-Thrive™ Training Cycle - Measure

Measure Performance:

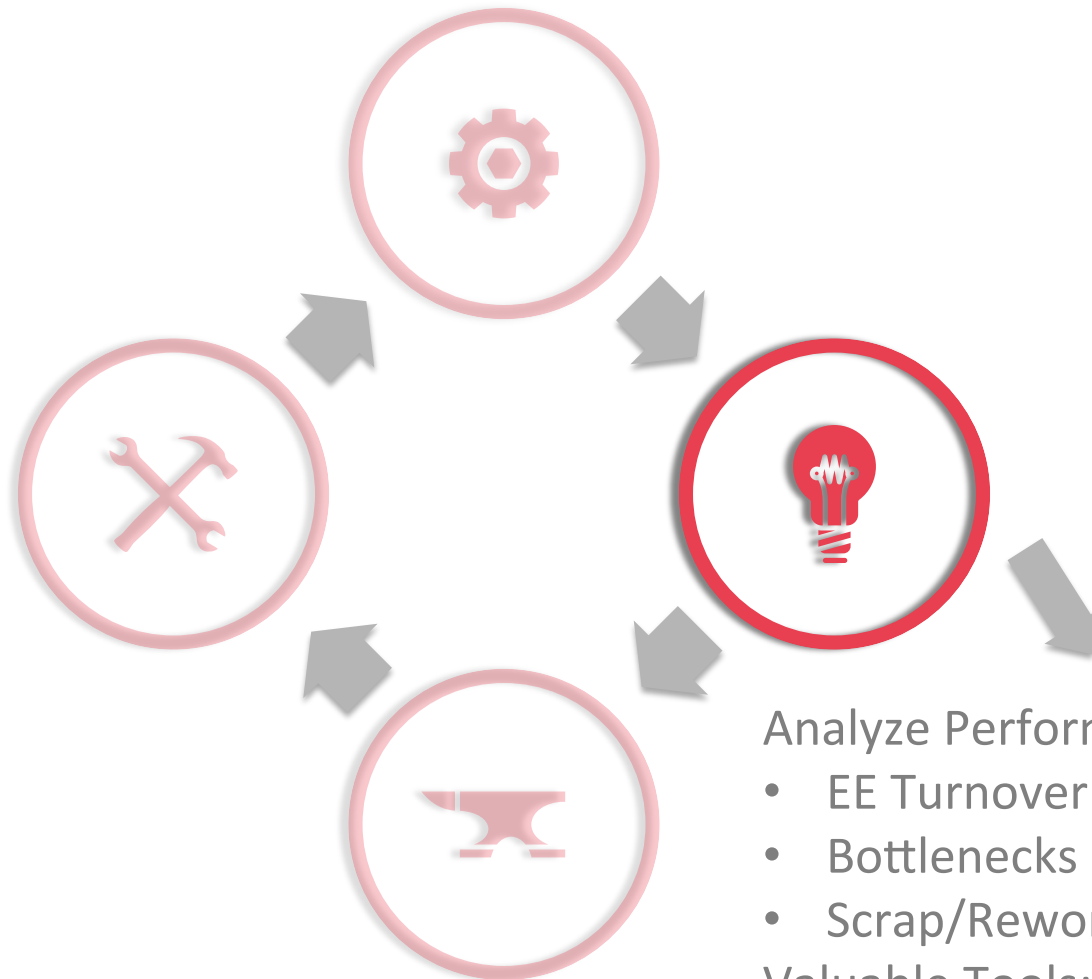
- Time Study
- Pace Capability
- % Uptime
- 1<sup>st</sup> Pass Yield



# KPI-Thrive™ Training Cycle - Measure



# KPI-Thrive™ Training Cycle - Analyze



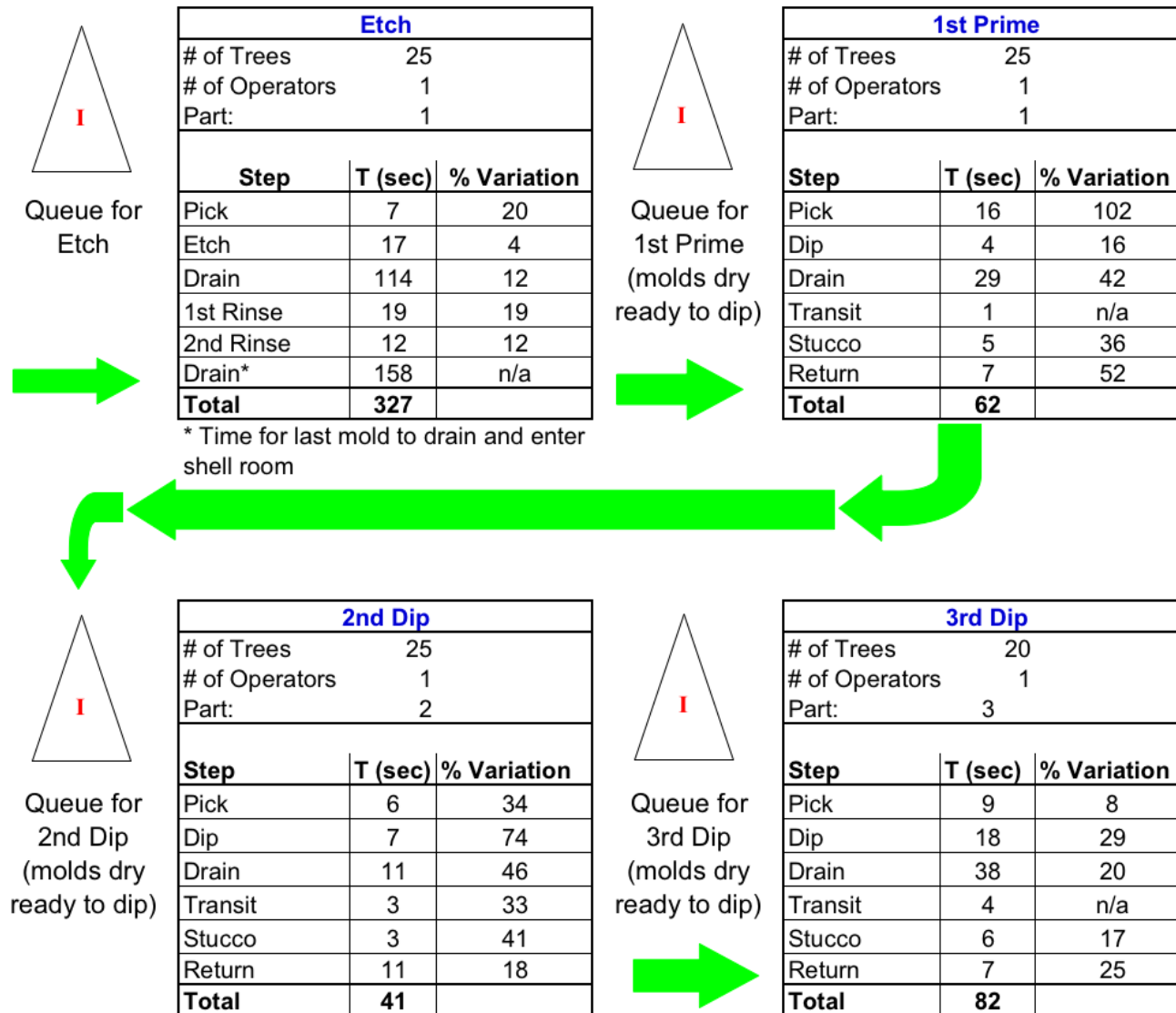
## Analyze Performance

- EE Turnover
- Bottlenecks
- Scrap/Rework

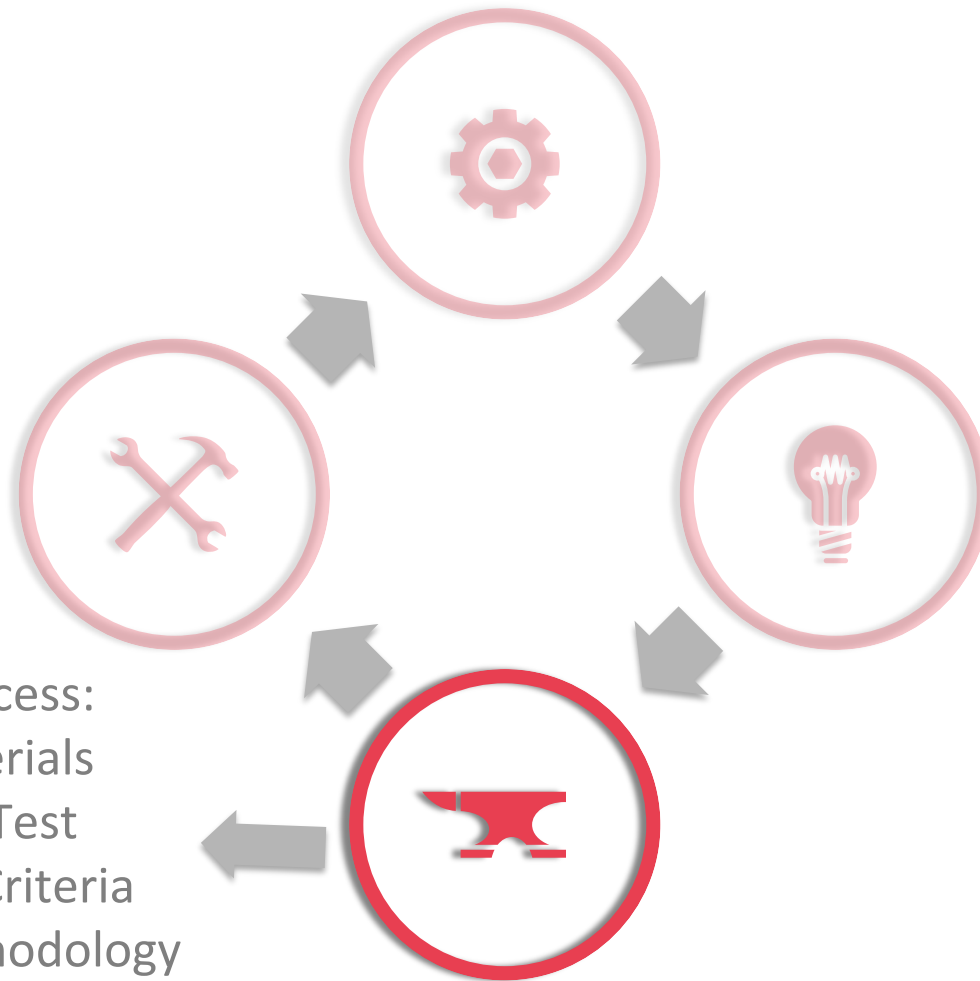
## Valuable Tools:

- Value Stream Mapping
- Skills Matrix

# KPI-Thrive™ Training Cycle - Analyze



# KPI-Thrive™ Training Cycle - Improve



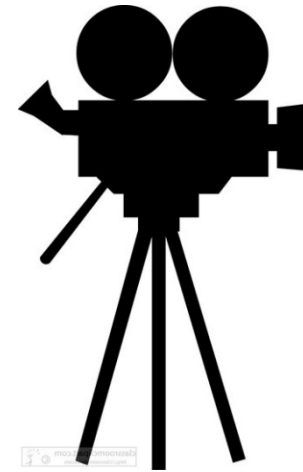
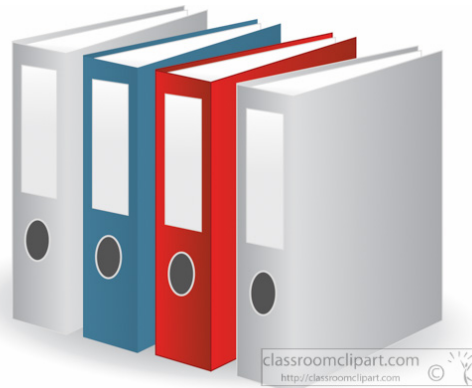
Improve the Process:

- Training Materials
- Competency Test
- Skills Matrix Criteria
- Training Methodology
- Operator Roles & Responsibilities

# KPI-Thrive™ Training Cycle - Improve Training Materials

What Materials are Needed to Train the Employee?

- Procedures
- Standard work
- Videos
- Visual Aids



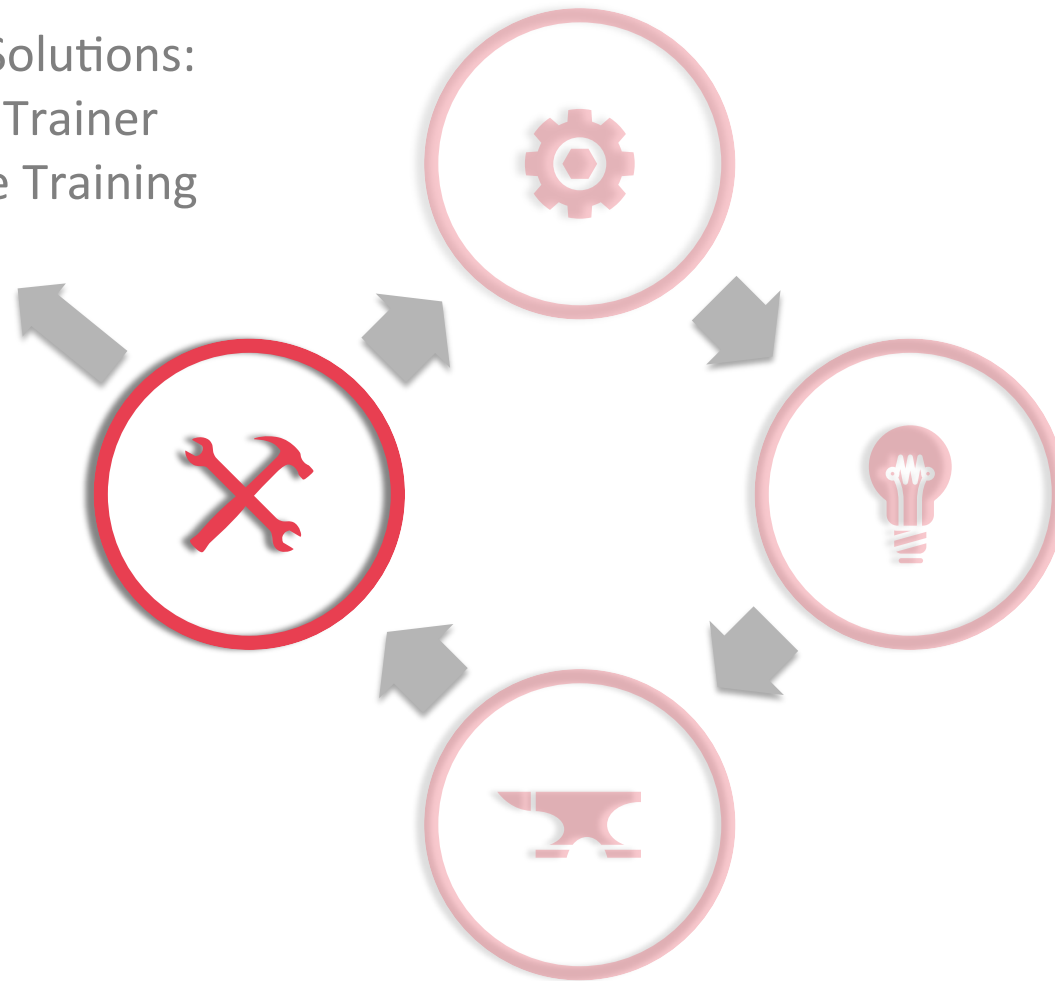
## KPI-Thrive™ Training Cycle - Improve Measuring Effectiveness

- Training Methodology
  - How is the operator trained?
- How will competency be checked?
  - Verbal test
  - Written test
  - Online testing
- How well is the operator trained?
  - Skills Matrix Criteria
- Training Documentation
  - ISO Records
  - Employee Reviews/Promotions

# KPI-Thrive™ Training Cycle - Implement

Implement Solutions:

- Train the Trainer
- Employee Training



## KPI-Thrive™ Training Cycle - Implement

- Training Within Industry
  - Methodology to train operators in a quick and efficient matter
- Job Instruction Training
  - Instruction is a skill
  - Trainer must prepare prior to instructing
  - Job must be broken down into Important Steps, Key Points and Reasons for each step

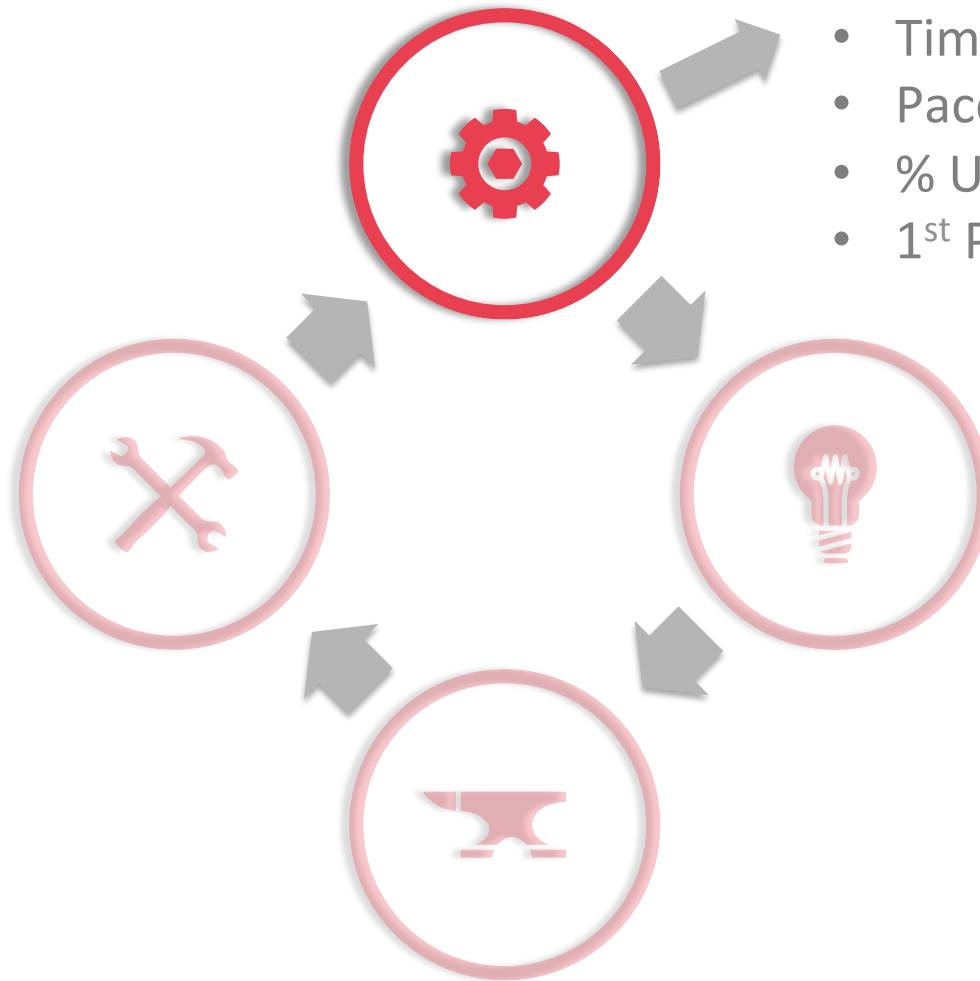
# Case Study: How to Hand Dip

Courtesy of  
FS Precision Tech, LA, CA

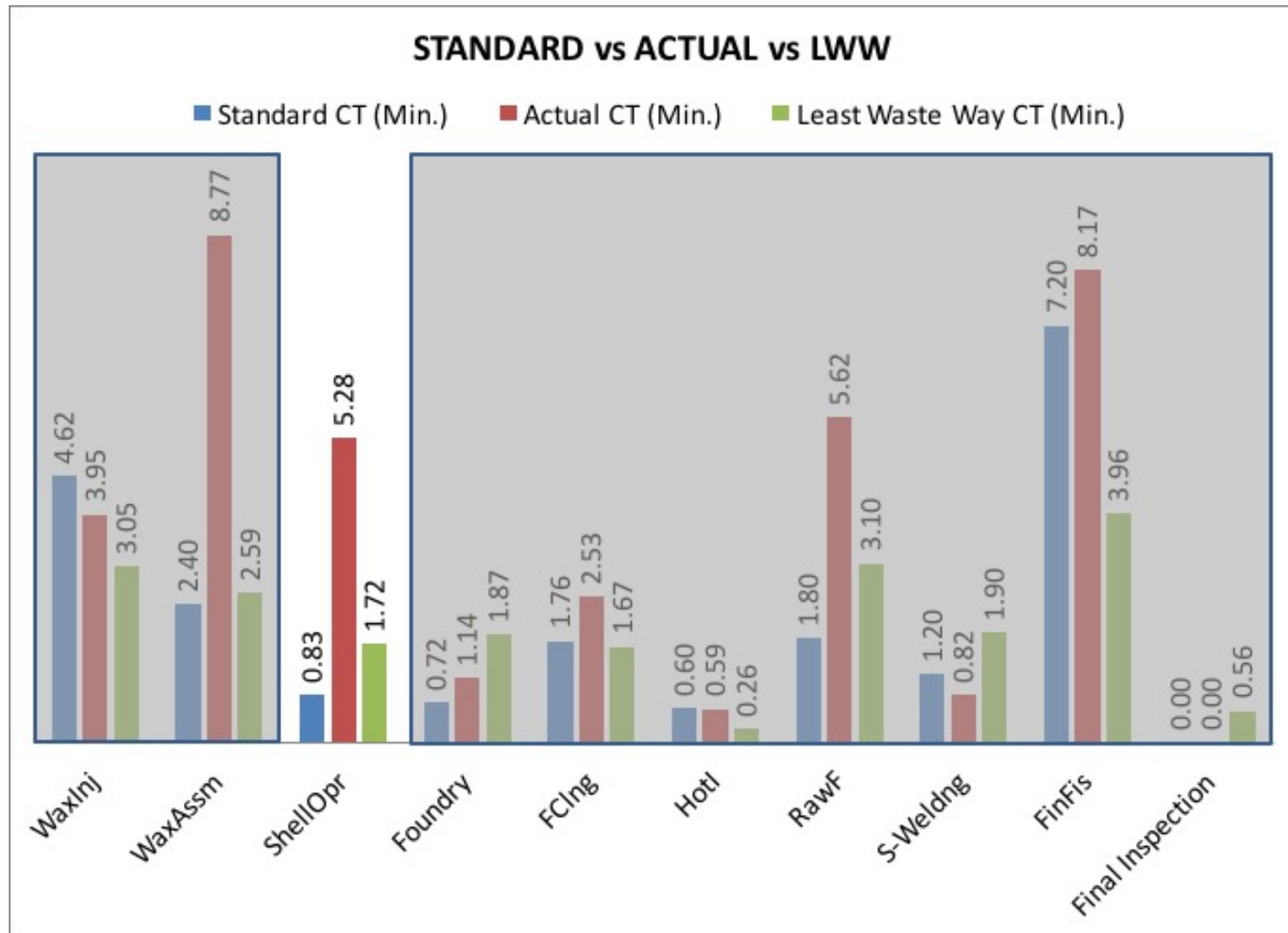
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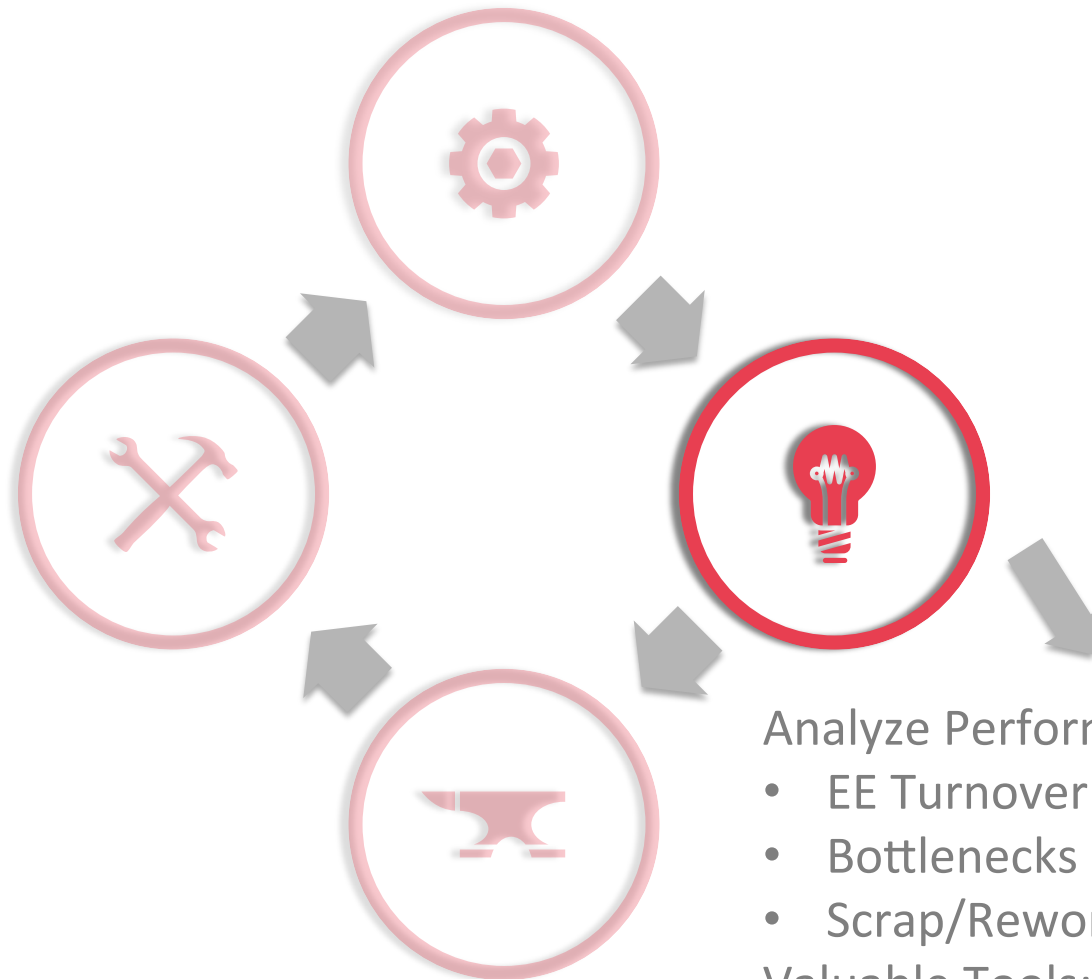
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# KPI-Thrive™ Training Cycle - Measure



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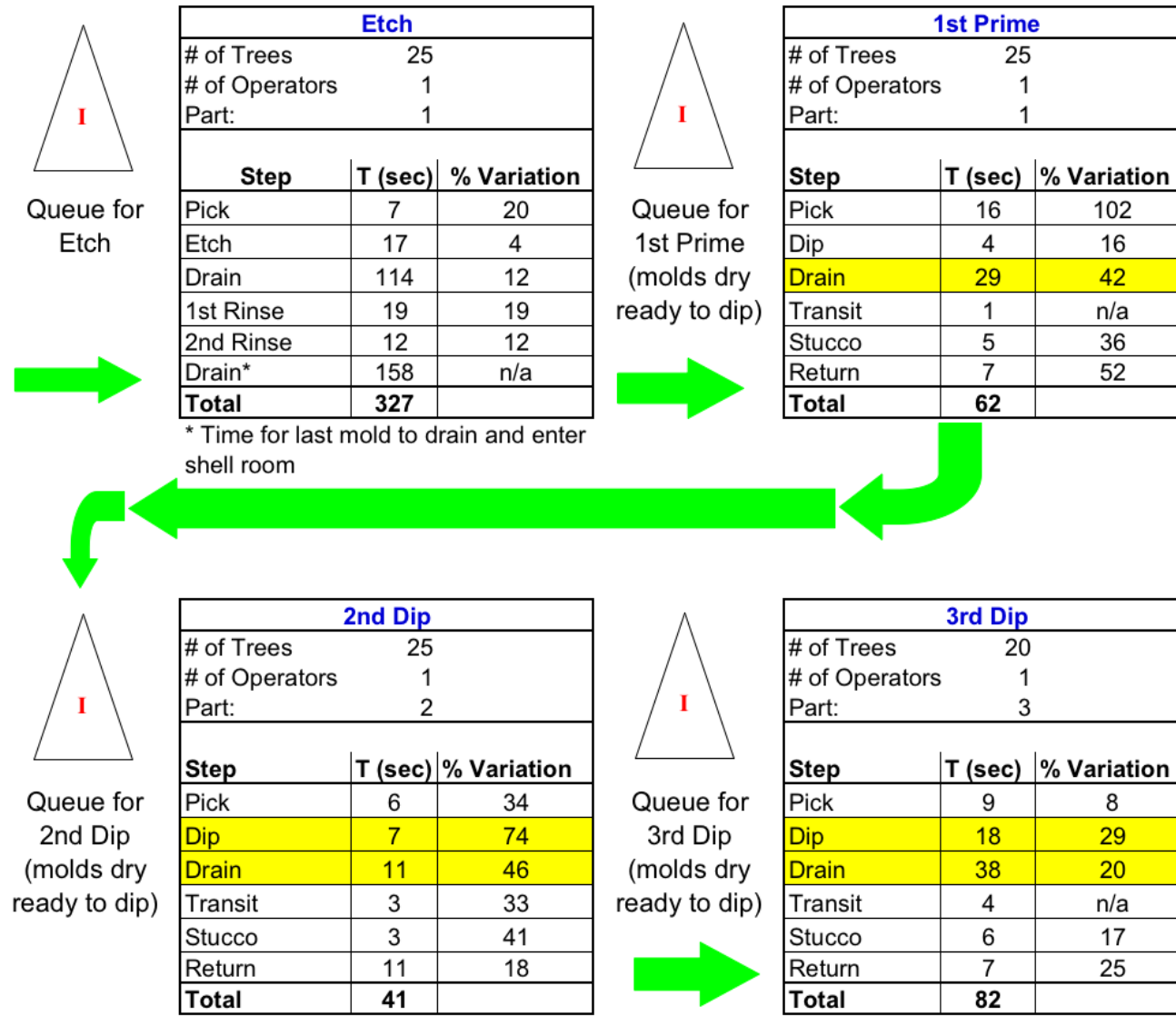
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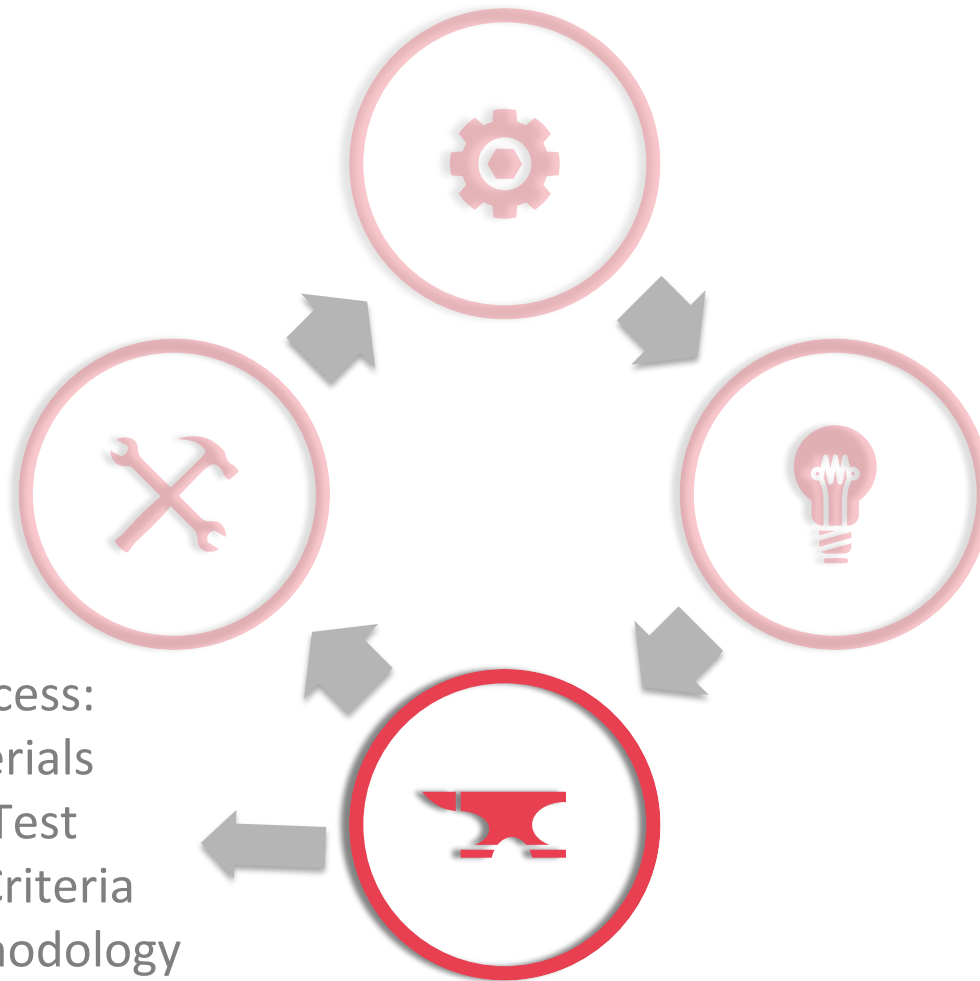


# KPI-Thrive™ Training Cycle – Analyze

Task \ Name	Slurry Mixing	Hand Dipping	Robot Operation	Viscosity	Dewax
Mike	1 2 4 3	1 2 4 3	1 2 4 3	1 2 4 3	1 2 4 3
Jeff	1 2 4 3	1 2 4 3	1 2 4 3	1 2 4 3	1 2 4 3
Jim	1 2 4 3	1 2 4 3	1 2 4 3	1 2 4 3	1 2 4 3
Bill	1 2 4 3	1 2 4 3	1 2 4 3	1 2 4 3	1 2 4 3
Juan	1 2 4 3	1 2 4 3	1 2 4 3	1 2 4 3	1 2 4 3

1= No Training    2=Some Training/Needs Supervision  
 3=Fully Trained/No Supervision Needed    4=Able to Train Others

# KPI-Thrive™ Training Cycle - Improve



Improve the Process:

- Training Materials
- Competency Test
- Skills Matrix Criteria
- Training Methodology
- Operator Roles & Responsibilities

## KPI-Thrive™ Training Cycle - Improve

- Reviewed current process against established procedures
  - Lead person wasn't following procedure
  - Current process was missing essential elements
- Together, combined best aspects of all
  - Current process
  - Established procedure
  - Industry best practices
- Once complete, documented new process via video, updated procedure and newly created standard work

## Standard Operations

Area / Machine

Shell Department

Date

1/13/16

Product

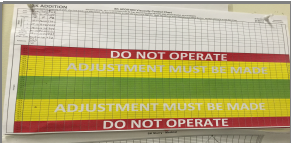




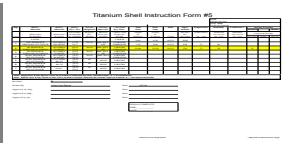
Back-Up Hand Dipping

Frequency:

Element

Photo

Description

1	<p><b>Required PPE</b></p> <ul style="list-style-type: none"> <li>Safety Shoes (Steel Toe, Water and Oil Resistant)</li> <li>Safety glasses (Safety Goggles, if prescription required)</li> <li>Gloves</li> <li>Aprons</li> <li>Dust Mask</li> <li>Earplugs (Optional)</li> </ul>	<p><b>Required PPE when dipping:</b></p> <p>A) Safety glasses B) Hard-soled shoes C) Protective gloves (optional) D) Ear protection (optional) E) Breath filter</p>
2	<p><b>Production Checks Prior to Dipping:</b></p> <ol style="list-style-type: none"> <li>Pre-pack coring requirements</li> <li>Drying times</li> <li>Pre-Wet or Vibrator Requirements</li> <li>Brushing of letters or other details</li> <li>Any special instructions listed</li> <li>Verify temperature &amp; RH of the room is within specification</li> <li>Verify slurry viscosity is within specification</li> <li>Ensure all paperwork is correct</li> </ol>	<p><b>Verify temperature and relative humidity are within range.</b> <b>If not, contact supervisor.</b></p>
3		<p><b>Verify viscosity is within range for dip tank.</b> <b>Check stucco beds for excessive fines or large particles of dried slurry.</b></p>
4		<p><b>Remove excess stucco from assembly by gently blowing air onto mold.</b> <b>Some parts require brushing between blades.</b> <b>Check Shell Technique Card for part specific instructions.</b></p>
5		<p><b>Slow immerse mold into the slurry at an angle. Keep in the tank until the bubbles stop coming to the surface.</b> <b>Take care to minimize air entrapment around serrations, grooves, ribs, sharp corners and pockets.</b></p>
6		<p><b>Remove the mold from the slurry. While draining, manipulate the mold to ensure even coverage.</b></p>
7		<p><b>Gently immerse mold in the fluidized bed.</b></p>
8		<p><b>Inspect the mold for even coverage prior to placing it back on the conveyor/rack.</b> <b>Record Date, Time and Operator on Shell Instruction Form.</b></p>

# Hand Dip Video

Back-Up Hand Dipping  
(reference PXX-XXX)



# Hand Dip Operator Competency

- Previously no formal method to test for competency and understanding
- Created an exam by pulling key elements out of the procedure

# Hand Dip Operator Competency

## Hand Dipping

### Question 1 of 10

What is the 1st thing you must do before hand dipping?

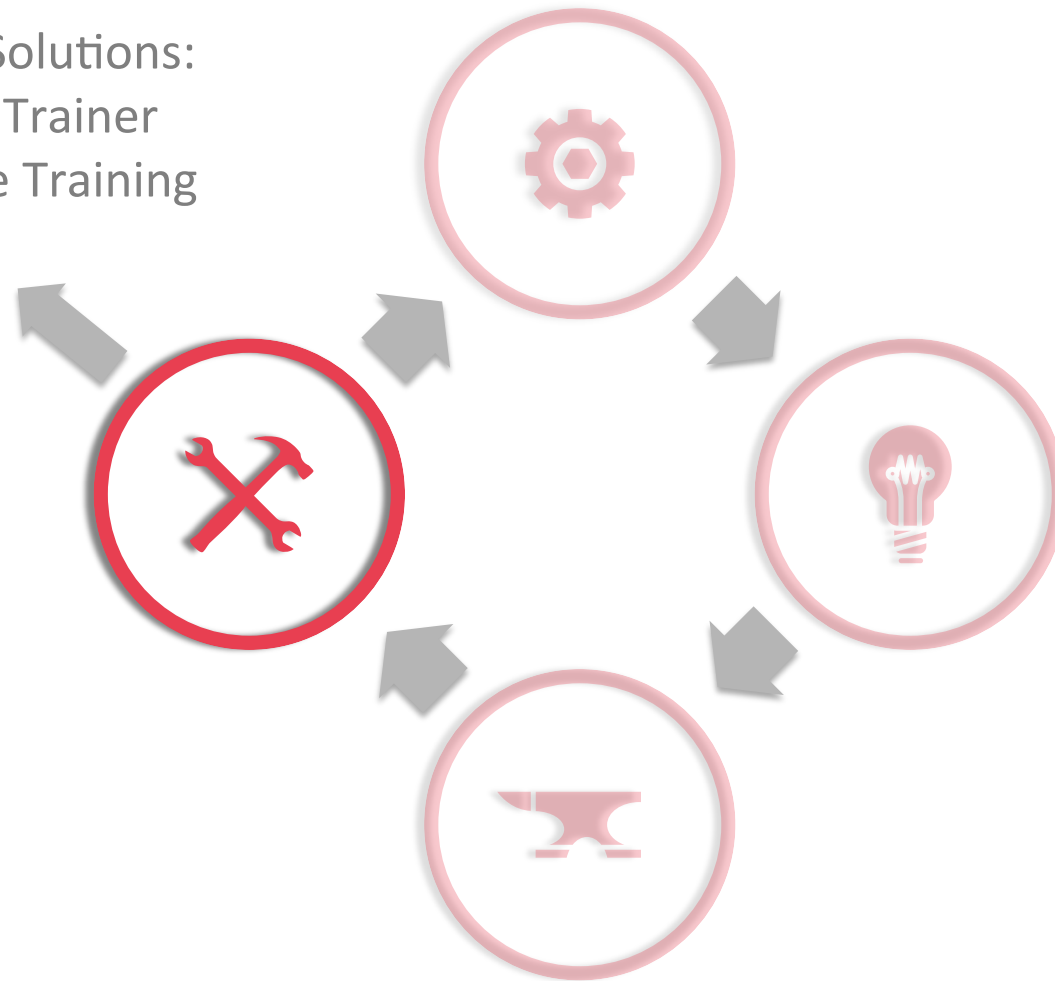
- ☐ A) Attach the handle.
- ☐ B) Stop the tank.
- ☐ C) Blow off the mold.
- ☐ D) Turn on the fluidized bed.

Next ►

# KPI-Thrive™ Training Cycle - Implement

Implement Solutions:

- Train the Trainer
- Employee Training



## KPI-Thrive™ Training Cycle - Implement

- Identified trainers based on skills, not longevity
- Added video and kinesthetic aspects to training
- Operators are being trained and then tested for understanding
- Highlighted key positions which needed additional operators trained

# Protecting the Process

# Prevent Process Creep

Periodically audit process against:

- Procedure
- Industry best practices
- Ensure documentation is up to date



Provide Reminders for Operators

- Make Procedures Available
- Post Standard Work
- Other Visual Aids?

# Summary

- Start by Measuring How the Process is Performing
  - Demonstrate improvement AND
  - Ensure Gains are Sustained
- Analyze data to make decisions
- Make sure training documentation is up to date
- Periodically audit the process
- Don't delegate training – make sure trainer is competent and prepared

# Thank You

- FS Precision Tech Co., LLC, Los Angeles, CA for use of their Procedures, Standard Work and Videos
- European Investment Casters' Federation

# References

<sup>1</sup>[http://skillspanorama.cedefop.europa.eu/sites/default/files/EUSP\\_AH\\_SkillsChallenges\\_0.pdf](http://skillspanorama.cedefop.europa.eu/sites/default/files/EUSP_AH_SkillsChallenges_0.pdf)

<sup>2</sup><https://www.imf.org/external/pubs/ft/wp/2015/wp15181.pdf>

<sup>3</sup>UK Commission for Employment and Skills (2014), UK Commission's employer skills survey 2013: UK results

<sup>4</sup>[http://www.manpowergroup.com/wps/wcm/connect/408f7067-ba9c-4c98-b0ec-dca74403a802/2015\\_Talent\\_Shortage\\_Survey-lo\\_res.pdf?MOD=AJPERES&ContentCache=NONE](http://www.manpowergroup.com/wps/wcm/connect/408f7067-ba9c-4c98-b0ec-dca74403a802/2015_Talent_Shortage_Survey-lo_res.pdf?MOD=AJPERES&ContentCache=NONE)

<sup>5</sup>Employee Engagement and Commitment: A guide to understanding, measuring and increasing engagement in your organization, SHRM Foundation, page 13

Questions?