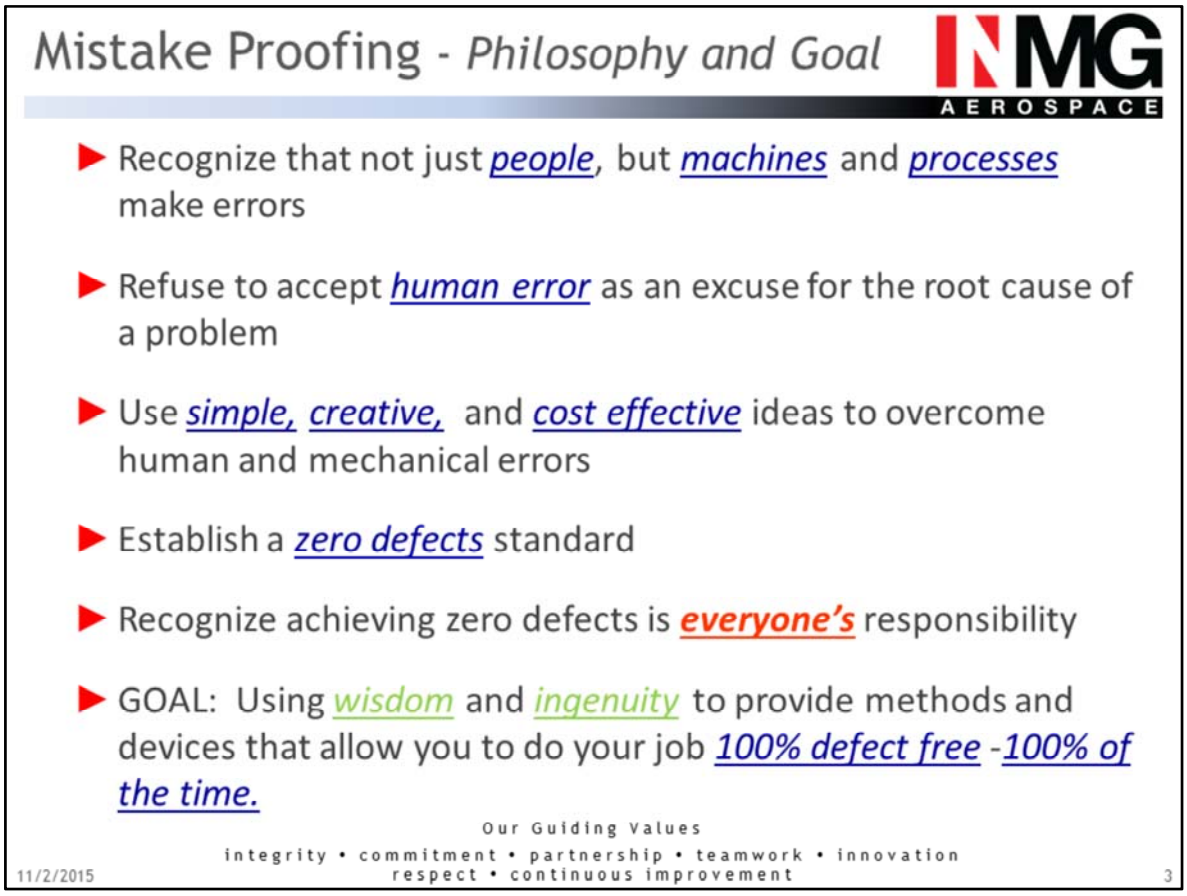
Mistake Proof Training
(Poka-yoke)

Revision Date: 11/2/2015

Mistake Proofing - Objectives

In this training course, you will:

- Understand Philosophy and our Goal
- Learn how to Mistake-Proof Operator Errors, using controls
- How Inspection fits in Mistake-Proofing
- Learn the three levels of Mistake-Proofing
- Take and "Pass" the Mistake-Proofing Test



Everybody and everything can make mistakes. Mistake proofing helps us so we don't make mistakes.

These mistake proofing ideas we come up with can be simple. One group used a child's plastic pinwheel toy to help them ensure the air was on in one operation.

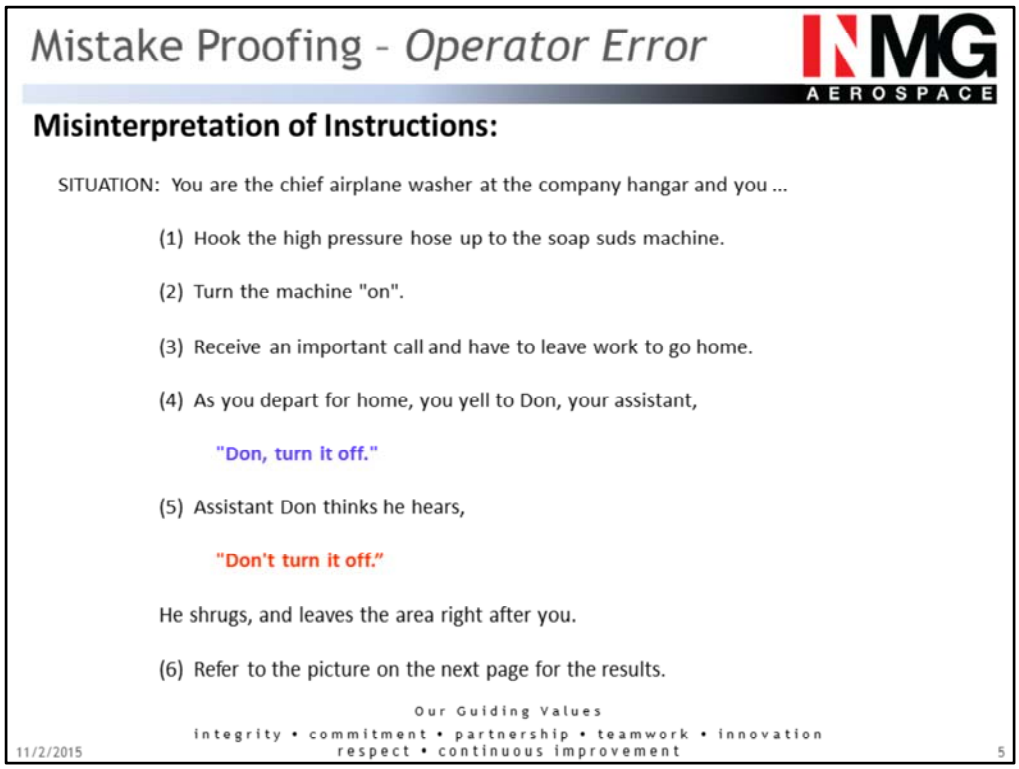
Human error is not an excuse we can use anymore. If a person makes a mistake, there's usually a problem with the process, not the person.

We all need to use mistake proofing as part of our Problem Solving Process. We need to work toward Zero Defects.

CONTROL - Through Mistake-Proofing

Control- respects the intelligence of people by removing judgment from the situations where errors are most likely to occur, such as:

- Lots of adjustments.
- Look-alike parts.
- Misunderstood instructions.
- Measurement error
- Similar configurations
- Multi-tasking
- Documentation
- Language



Remember rule #1, people make mistakes. Here's a perfect example of how if a problem isn't mistake proofed, problems could occur.

Mistake Proofing - *Operator Error*

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Misinterpretation of Instructions:

How would you Mistake-Proof the error that drove the result above?

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Controls in place to automatically turn off the machine.

Same thing, Rule number 1. People make mistakes.

Mistake Proofing - *Operator Error*

Being Forgetful:

How would you Mistake-Proof the error that drove the result above?

Mistake Proofing

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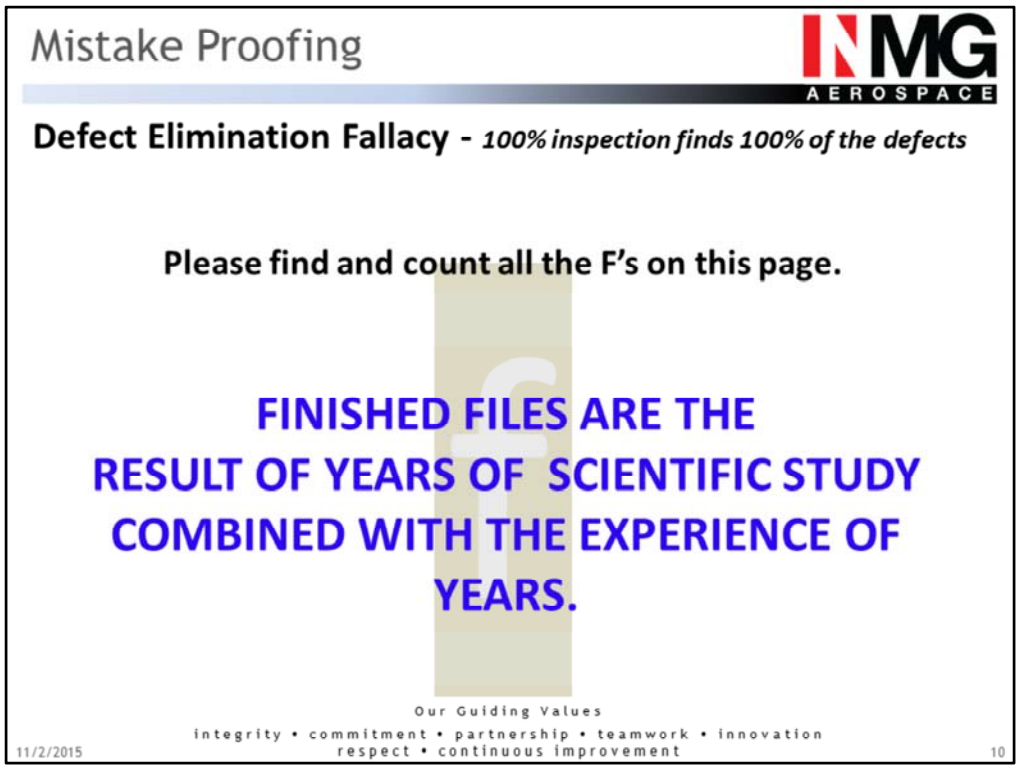
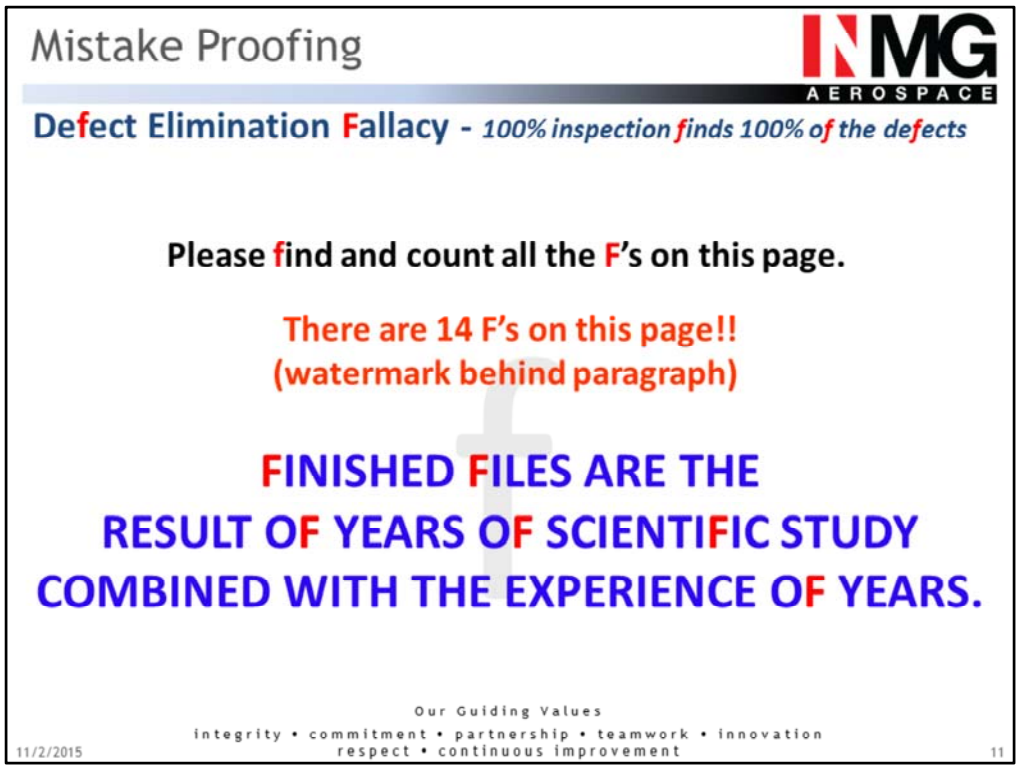
People do in fact make errors….

In order to become a <u>zero defects</u> standard business, we must <u>mistake proof the PROCESS</u>.



How Inspection fits into Mistake Proofing



Adding inspection will HELP prevent the problem from escaping to the customer but it will NEVER mistake proof the problem because of RULE # 1. people make mistakes.

Mistake Proofing

Everyday Examples:

- Auto shut-off irons so we cannot make the mistake of leaving the iron on all day.
- Pause-and-serve coffee makers so the coffee stops brewing when the pot is removed.
- Automatic sinks in public facilities so the water cannot be left on when someone walks away.
- Circuit breakers that trip when they are overloaded.
- Three-prong outlets so we cannot make the mistake of wrong polarity.
- Buzzers in cars that warn you that you left the keys in the ignition.
- Interlocked circuits that automatically lock the car when you shift into drive.
- **Can you think of any others???**

Mistake Proofing - Levels

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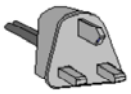
Strategies to Stabilize Variation

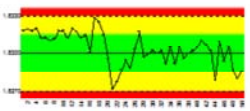
LEVEL 1 DEVICES

- Physical devices that <u>prevent</u> the error at the source.
  - Designing errors out up front through thorough quality planning.
  - One way fits, required actions in order to operate equipment, etc.



LEVEL 2 DEVICES

- Problem <u>detected</u> and <u>corrected</u> during the process
- Warning devices like Control Charts, buzzers, lights, alarms that require a human response.
  - E.g. Control Chart



LEVEL 3 DEVICES

- Helps prevent a defect <u>from going onto the next operation</u>
  - E.g. kick-out device on a gage checking bushing diameters
- May prevent an unsafe condition from happening even though an unsafe act has already occurred
  - E.g. oil drip pan beneath a machine).

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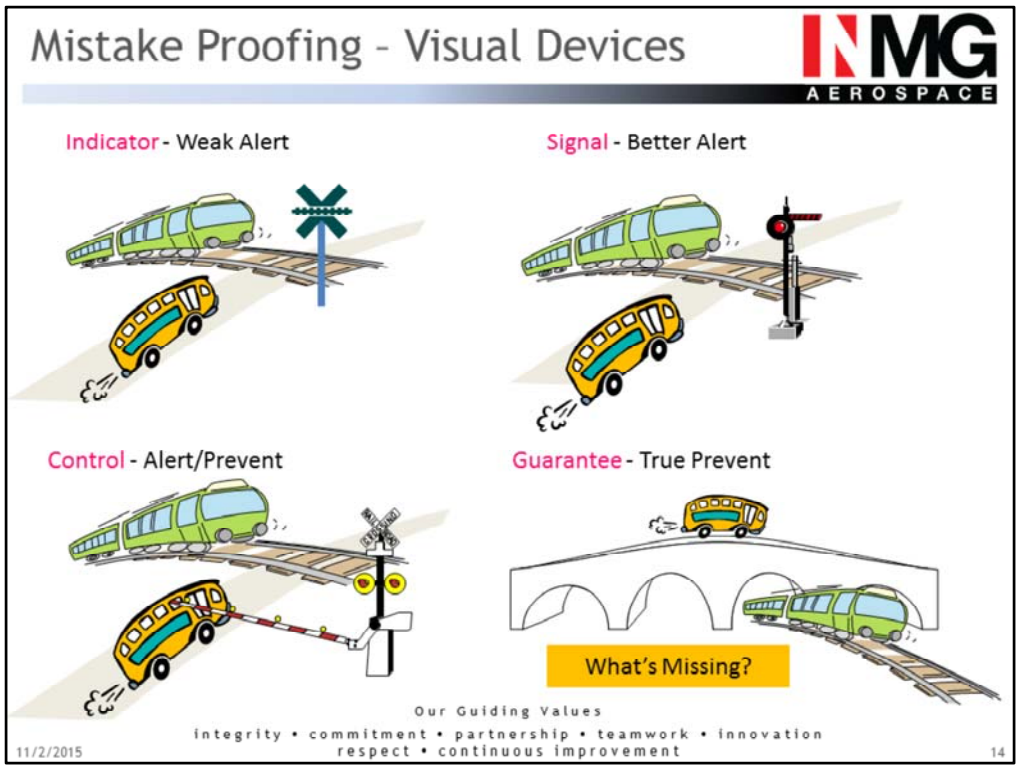
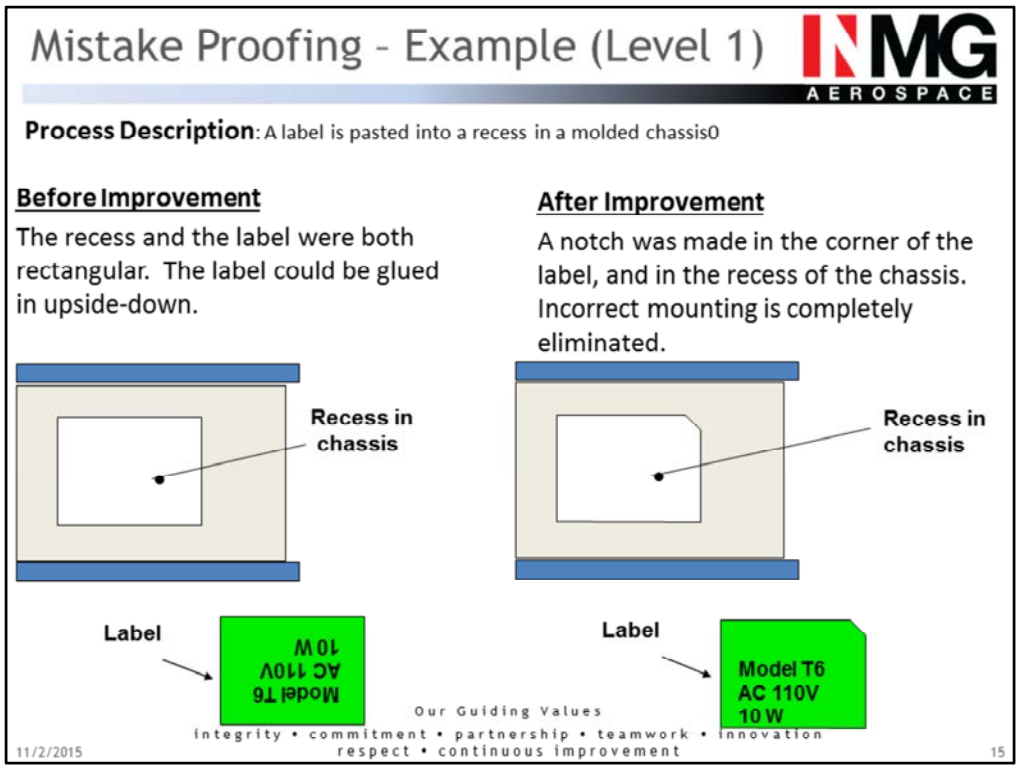
Level 1- BEST
Level 2- Good
Level 3- ok

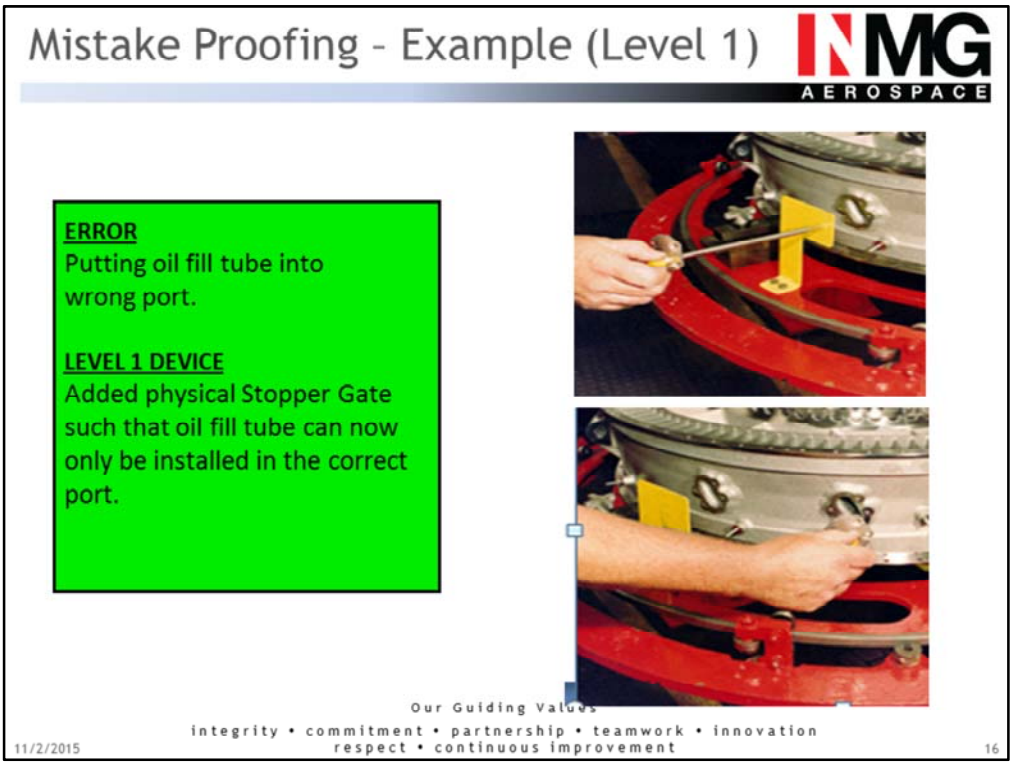
We want level 1.



Indicator is a Level III
Signal is a Level II
Control is a Level II (Could be a Level I but it still allows someone to drive around it)
Guarantee- Level I (What is missing from this level I? Guard rail to prevent bus from driving off bridge into train.



Good example of a PROCESS improvement.



Control device put in place to prevent installation in wrong location

Mistake Proofing - Example (Level 1& 2)

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Example Level 1 & 2 Mistake Proof - Speedy Dry

tting

UNSAFE ACT
Putting into speedy dry container various other shop debris.

LEVEL 2 DEVICE
Warning label to only dump used speedy dry into container.

LEVEL 1 DEVICE
Added physical screen such that only the speedy dry would be able to go into container.

Larger items collect at top of screen.

Mistake Proofing - Example (Level 3)

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The "Unsafe Act" or "Defect" has occurred; Oil leaking out of the machine.

The Drip Pan prevents the oil from getting onto the floor and causing an unsafe condition.

How could we do better?

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Alarm when leaking
Automated shut off for machine when leaking.

Mistake Proofing - Example (Level 3)

PPE may be considered a Level 3 M/P device for the "Mistake" or "Unsafe Condition" is still present (i.e., fumes, sharp blade, chemicals, etc.) but is minimized by the use of PPE.

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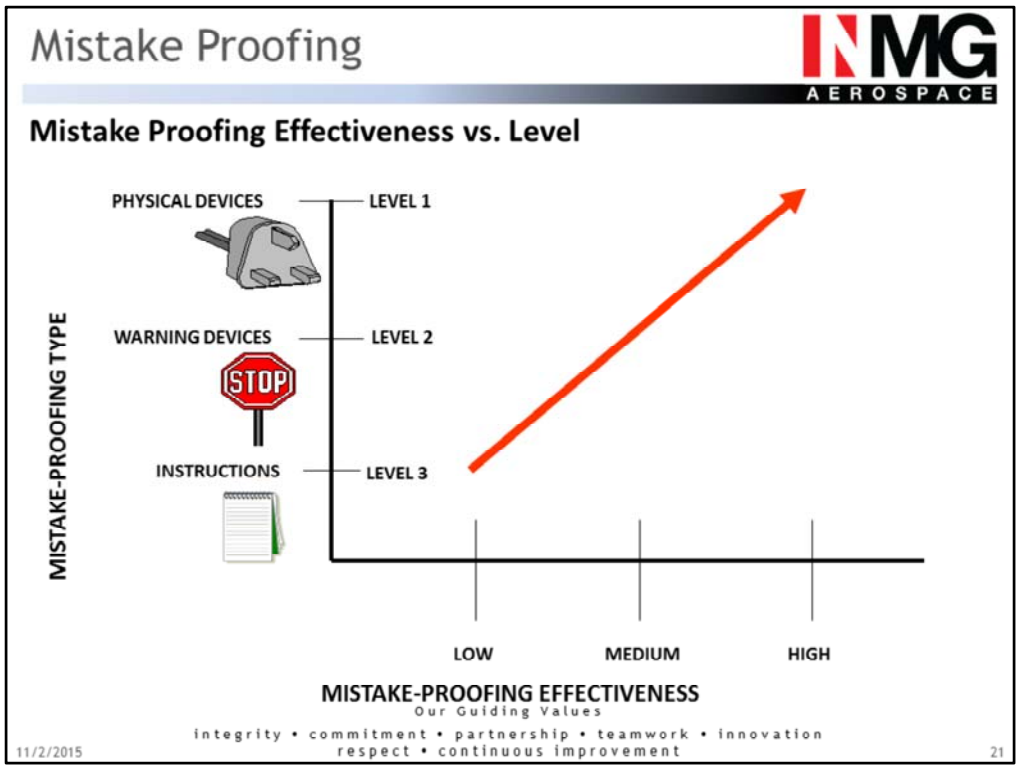
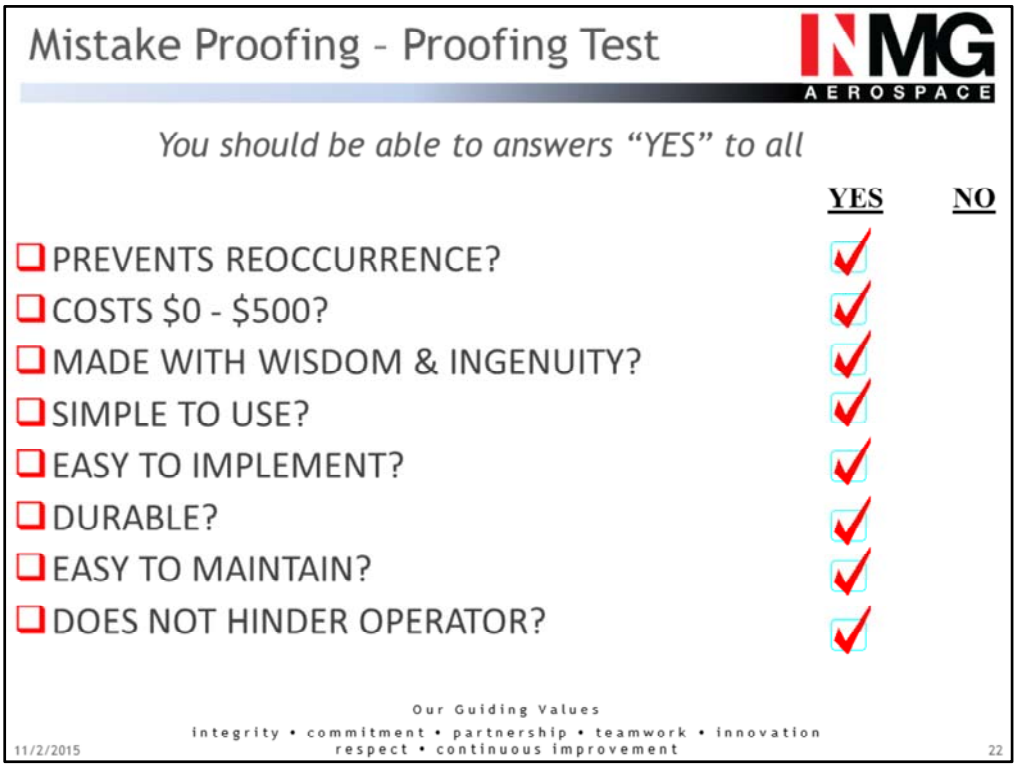
A opportunity for a defective part is still there but level III will help minimize the possibility of nonconformance

Physical barrier to prevent forklift from injuring employees. Level I



The lower the mistake proof, the lower the effectiveness. Think outside of the box for simple solutions.



Purpose: This slide gives some guidelines to follow when creating a Mistake Proofing device.

Main points:

•You want to be able to answer yes to all these questions to insure that you have an effective Mistake Proofing device.

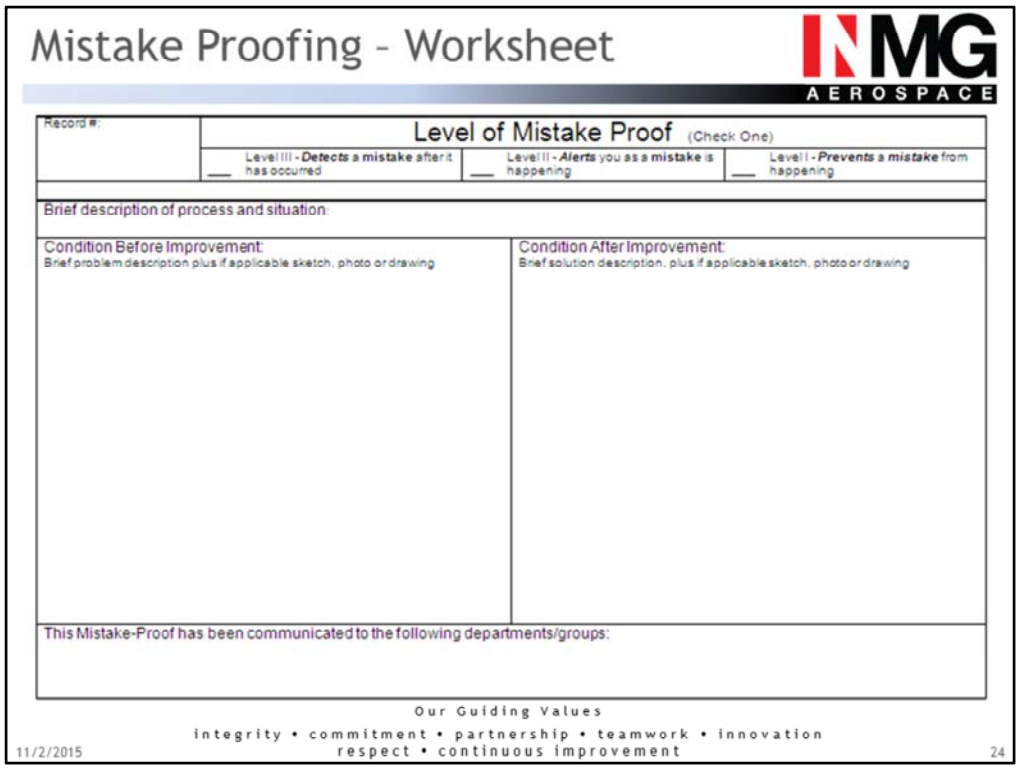
•It's ideal if your device has all these features but, if circumstances arise and you are unable to obtain this level it may be acceptable (something is better than nothing).

Purpose: To inform the audience of a test that can be performed to insure the success of the Mistake Proofing **device.**

Main point:

•The nasty test is a test that we need to do during the design stage of the mistake proof devise or as soon as close as we can to that stage.

•Its nasty because we want the operator to try and fail. They should use the device with the intent on trying to make it fail. If it is impossible to fail than you truly have a Mistake-proof device.



Mistake Proofing - Worksheet

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Record #:	Level of Mistake Proof (Check One)		
	___ Level III - ***Detects*** **a mistake** after it has occurred	___ Level II - ***Alerts*** you as a **mistake** is happening	___ Level I - ***Prevents*** **a *mistake*** from happening

Brief description of process and situation:

Condition Before Improvement: Brief problem description plus if applicable sketch, photo or drawing	Condition After Improvement: Brief solution description, plus if applicable sketch, photo or drawing

This Mistake-Proof has been communicated to the following departments/groups:

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A great tool to show the before and after of a condition. This is a good success story to post so that others see what is being done.