



# ***The Federalization Process***

## ***USA requirements for objective dummy specification***

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**Meeting of Experts on Rear and Side Impact  
Dummy Harmonization**

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# *USA FMVSS Regulation*

- **FMVSS Regulatory procedure**
  - Self-regulating with Verification
  - Tools (dummies) specified in part 572, CFR 49
  - Test procedures specified in part 571, CFR 49
  - Compliance testing by NHTSA
    - Annual verification sample
    - Independent contract test labs
  - Non-compliance
    - Manufacturer is accountable



# *Part 572: Chrysler vs NHTSA*

- **In 1971 the U.S. Court of Appeals, Sixth Circuit in Chrysler vs NHTSA, ruled that regulatory crash test results must be-**
  - Repeatable and Reproducible
  - Objective (as measured by instruments, not opinions)
  - Accurate (pre-test certification)



# *Part 572: Implemented*

- **In 1973 NHTSA created part 572, title 49, CFR as a repository for crash test dummy specifications**
  - Drawings
  - Certification test specifications
  - PADI (Procedures for Assembly, Disassembly and Inspection)
  - Durability, R&R, & Biofidelity documentation



# Dummy Federalization Matrix

Rhule, Rhule and Donnelly, 19<sup>th</sup> ESV Conference, Washington, DC, 2005

## Operation

	Dummy Inspection	Component Testing	Sled Testing	Crash Testing
Drawing Package				
Certification				
Durability				
R&R				
Biofidelity				
PADI				

*Requirement*

*Time* →



# Drawing Dummy Inspection

- *Multiple dummies & suppliers*
- *Disassemble & inspect & measure*
- *Discrepancies listed*
- *Corrections made (parts or drawings)*

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## Drawing package

- *Assembly, sub-assembly & detail*
- *Parts list*
- *Material specifications*
- *Mass properties*




# Certification

## Component Testing

- *Pendulum test, drop test, etc.*
- *Simple, repeatable test*
- *Common equipment*

Drawing Package	

## Certification

- *Verify that the dummy is performing properly*
- *Components relevant to injury criteria*
- *Loaded in crash test range*
- *Response targets  $\pm$  tolerance*



# Durability

## Testing

- *Repeat component testing*
- *High energy component testing*
- *OOPs testing*
- *Sled testing*
- *Crash testing*

*Requirement*

Drawing Package	
Certification	
Durability	
...	
Bio...	
P...	

## Durability

- *Provide accurate results in crash tests*
- *Survive multiple crash tests*
- *Survive poor performing vehicle tests*





# *Repeatable*

## *Testing*

- *Repeat component testing*
  - *Single dummy*
  - *Multiple dummies*
- *Repeat Sled testing*
  - *Single dummy*
  - *Multiple dummies*

*Requirement*

Drawing  
Package

Certification

## *R & R*

- *Repeatable response for a single dummy*
- *Reproducible response among dummies*
- *Emphasis on Injury Criteria channels*





# PADI

## Operation

		<i>Experience gained during the entire evaluation process, testing and repair</i>		
Drawing Package				

Requirement

**PADI** (*Procedures for Assembly, Disassembly and Inspection*)

- *How to setup and use the dummy*
- *Procedures for measuring dimensions, weights, polarities, probe structural properties*
- *Body section exploded views, photographs, tools, sequence of operation, etc.*



# Dummy Federalization Matrix

Rhule, Rhule and Donnelly, 19th ESV Conference, Washington, DC, 2005

## Operation

*Requirement*

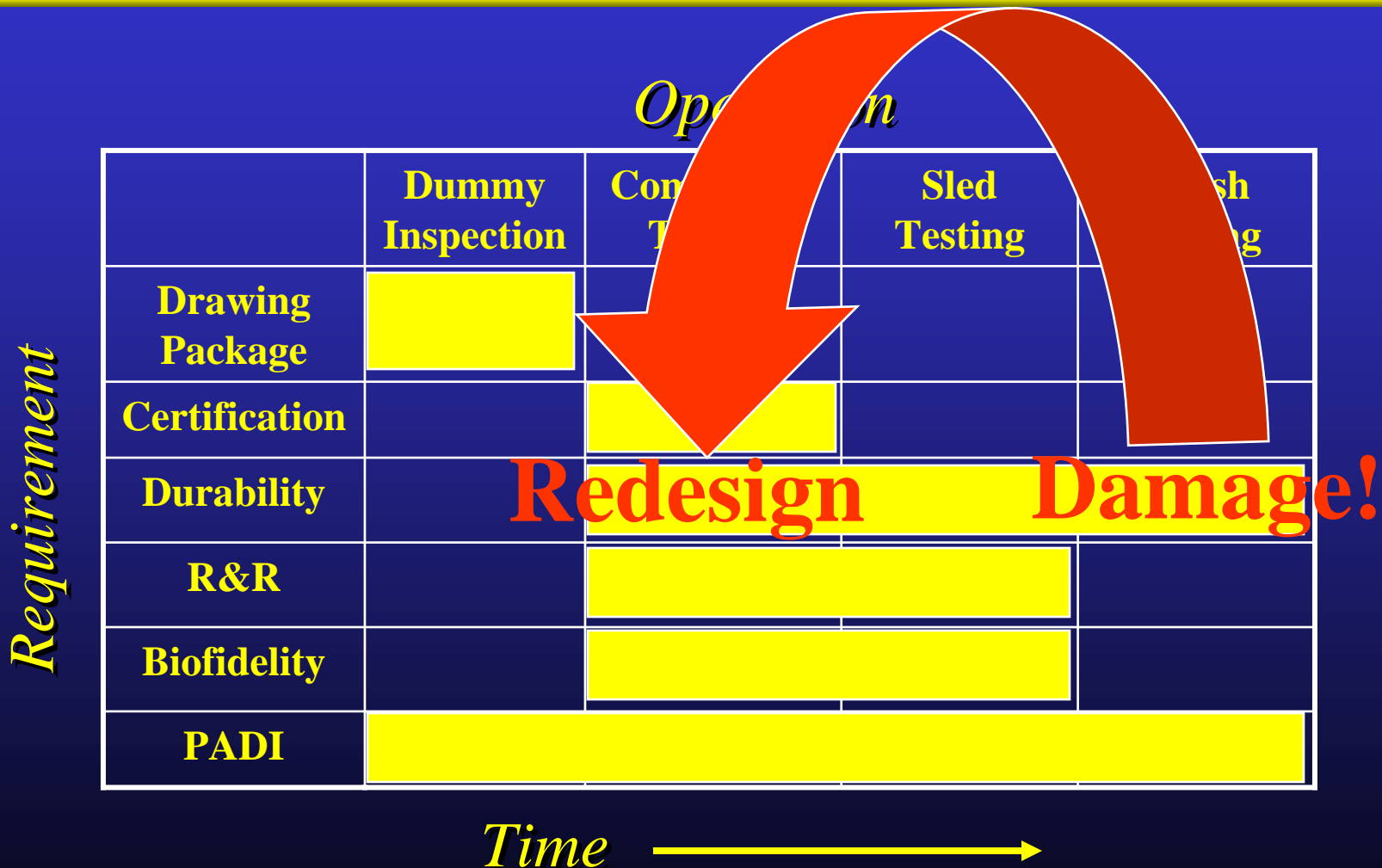
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*Time* →



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## Operation

*Requirement*

	Dummy Inspection	Component Testing	Sled Testing	Crash Testing
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*Time* →



*Thank you*

