



WorldSID Update

GRSP, 10th - 13th December, 2002

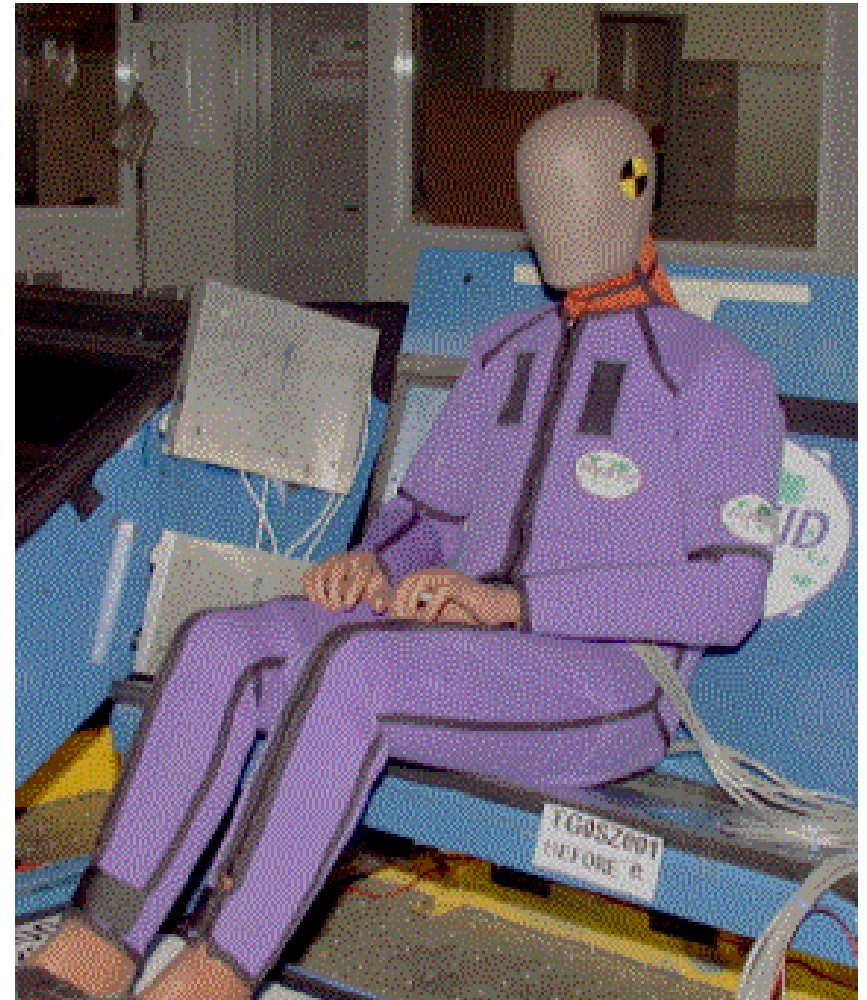
Martin Page - CEESAR

on behalf of

WorldSID Task Group and Design Team

WorldSID Update

- ▶ Programme
- ▶ Evaluation of prototype
- ▶ Technical evolution
- ▶ Prototype biofidelity
- ▶ Pre-production dummy evaluation programme
- ▶ Documentation



WorldSID Schedule

START
1998

Dec.
2002

FINISH
March
2004



WorldSID Schedule

Prototype delivery



1998

Dec.
2002

March
2004

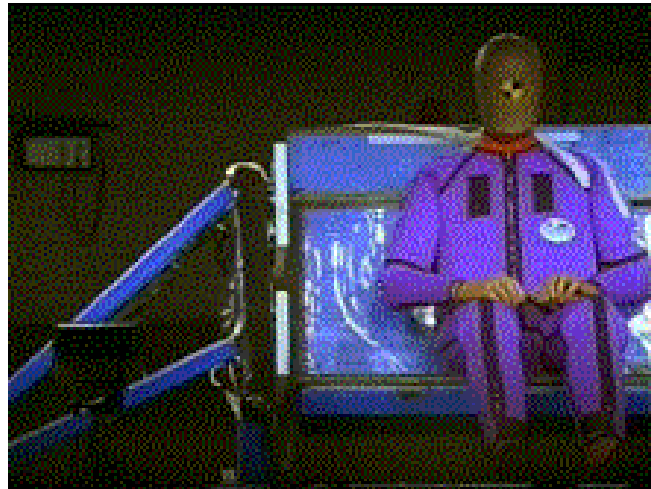
Dec.
2000



WorldSID Update

WorldSID Schedule

Prototype evaluation



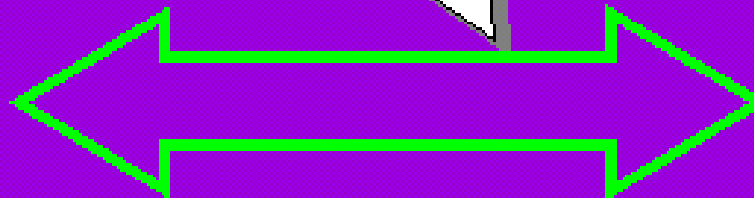
- 1 dummy
- global evaluation
- biofidelity

1998

Dec.
2002

March
2004

Dec.
2000



Prototype Evaluation - ISO TR9790

Segment	TESTS		
	Drop	Impactor	Sled
Head	1		
Shoulder		1	3
Thorax	1	2	2
Abdomen	2		3
Pelvis	2	2	6

= 25 test config'ns

x3 (runs per config'n)
x2 (left & right sides)

=150 tests

(1st phase of testing only)

WorldSID Update

Prototype Upgrades

- ▶ **Shoulder** - reduce deflection
 - Shoulder damping material thickness increased to 9mm
- ▶ **Pelvis** - reduce stiffness
 - Transfer of mass from femur to thigh flesh
 - Upper thigh flesh decoupled from bone
 - Upper thigh DAS mount in flesh
 - Pelvic bone softened
 - Pubic load cell dimension reduced
 - Buffers added to pelvis
- ▶ **Neck** - Prototype biofidelity rating was low, but thought this was due to a soft shoulder
 - No modifications were made

Evaluation of Upgraded Prototype

- ▶ TR9790 repeated + additional tests

	Biofidelity Rating Prototype	Biofidelity Rating Prototype Rev. 1
Head	10	10
Neck	3.61	5.2
Shoulder	5.82	7.0
Thorax	6.94	7.9
Abdomen	6.52	6.1
Pelvis	5.44	7.1
Overall	6.5	7.3

Target: « Good » to « Excellent » biofidelity
(B ≥ 6.5)

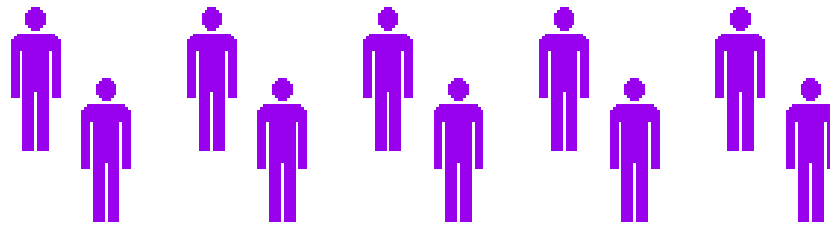
Evaluation of Upgraded Prototype

- ▶ Best biofidelity available
- ▶ Even better biofidelity expected for pre-production version
- ▶ Over 300 evaluation tests now performed

Body Region	SID	ES-2	Biosid	WorldSID prototype Rev. 1
Head	0	5	10	10
Neck	2.5	4.4	6.5	5.2
Shoulder	0	5.3	7.3	7.0
Thorax	3.1	5.2	6.8	7.9
Abdomen	4.4	2.6	5.6	6.1
Pelvis	2.5	5.3	5	7.1
Overall	2.3	4.6	6.2	7.3

WorldSID Schedule

Manufacture 10-12 Pre-Production dummies
Delivery to commence around March 2003



Dec.
2002

March
2004



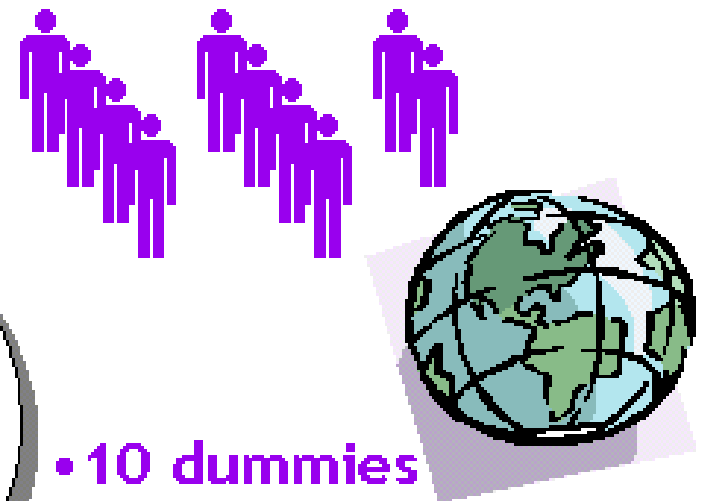
WorldSID Schedule

Pre-production
dummy evaluation



Dec.
2002

March
2004



- 10 dummies
- global evaluation
- all aspects evaluated

Pre-Production Dummy Evaluation

Evaluation of pre-production dummies by worldwide regulatory bodies, OEMs, suppliers, and researchers

Comprehensive evaluation programme to include:

▶ **Biofidelity:**

- Assess evolution of biofidelity (TR9790)
- Evaluate to IHRA requirements
- NHTSA biofidelity rating

▶ **All other aspects including:**

- Repeatability
- Reproducibility
- Sensitivity
- Handling
- Etc.

Pre-Production Dummy Evaluation

Selection of tests identified for WorldSID Pre-Production Dummy Evaluation

Biofidelity (25+ configurations)
TR9790, (IHRA)
NHTSA

Verification Tests

IHRA Side Impact Test Procedure
FMVSS 214 – U.S. Side Impact Full Vehicle Test MDB
R95 European Side Impact Full Vehicle Test MDB
IIHS Side Impact Test – Full Vehicle MDB
SUV to Car Perpendicular Impact
EuroNCAP
SINCAP

Durability body parts

Decel Sled Parameter Study
Sensitivity to non crash parameters
Sensitivity to car environment features

Static OOP IHRA
Static OOP ISO
Pole sled test
Rollover tests
Accident Reconstruction

Rigid wall Sled Tests for Reproducibility / Repeatability
Offset Wall Test to evaluate durability
Evaluation of 2 Dummies from Different Manufacturers
Positioning
Dummy handling
Target stickability

Subject to revision



Ready for Global Regulation

March 2004



- Production dummy
- Full documentation
- Comprehensive evaluation
- Public domain



www.worldsid.org