ANCAP
Crash testing for safety
AUSTRALASIAN
NEW CAR ASSESSMENT
PROGRAM

SAFETY PRECAUTIONS AND ASSESSMENTS FOR CRASHES INVOLVING ELECTRIC VEHICLES

Michael Paine - Technical Manager, ANCAP

22nd ESV - Washington

INTRODUCTION

ANCAP
Crash testing for safety
AUSTRALASIAN
NEW CAR ASSESSMENT
PROGRAM

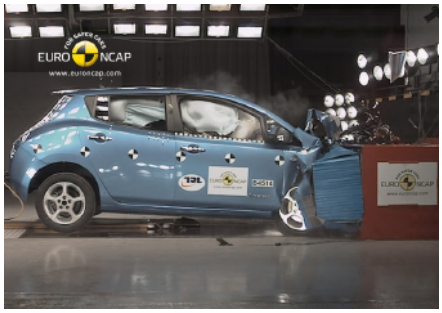
- Fully electric cars and hybrid cars have electrical systems that require special precautions to be taken in the event of a severe road crash
- Hazards include corrosive chemicals, toxic fumes, fire and electric shock
- NCAPs and other crash test organisations need review the safety procedures for dealing with crashed electric vehicles

FAA laptop computer fire tests

RECENT CRASH TESTS

ANCAP Crash testing for safety
AUSTRALASIAN NEW CAR ASSESSMENT PROGRAM

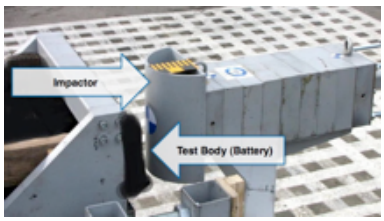
- ANCAP & JNCAP conducted a 64km/h offset crash test of the Mitsubishi i-MiEV in Japan in October 2010
- Euro NCAP recently conducted offset, side impact and pole crash tests of the i-MiEV and Nissan LEAF
- Several hybrid vehicles have been crash tested by NCAPs
- No reported electrical problems in any of the tests



STANDARDS FOR EVs

ANCAP Crash testing for safety
AUSTRALASIAN NEW CAR ASSESSMENT PROGRAM

- Amendment to ECE Reg 94 sets out post-crash electrical safety checks - conducted by JARI for ANCAP test
- Sandia National Laboratories Battery Abuse Testing Laboratory - biggest concern is establishing the condition of the battery after a crash
- TÜV SÜD Automotive in Germany has also conducted severe impact testing of Li-ion car batteries (covered in a talk later this morning)



CRASHES THAT MIGHT CHALLENGE EVs

ANCAP
Crash testing for safety
AUSTRALASIAN NEW CAR ASSESSMENT PROGRAM

- Vehicle manufacturers, test authorities and regulators are working to ensure that high standards for EV safety are maintained

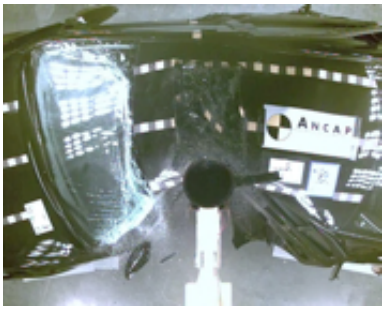
- However, there will still be crashes that are so severe that they challenge the built-in safety systems

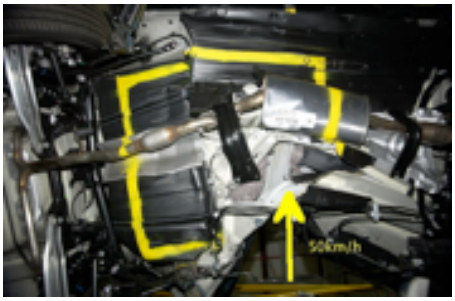
29km/h pole test of i-MiEV (no electrical problems)

CRASHES THAT MIGHT CHALLENGE EVs

ANCAP
Crash testing for safety
AUSTRALASIAN NEW CAR ASSESSMENT

ANCAP 29k/h pole test of a non-EV sedan





Very severe 50k/h pole test of same model sedan

New Zealand FIA Foundation vicroads RAA RACV RACQ TAC

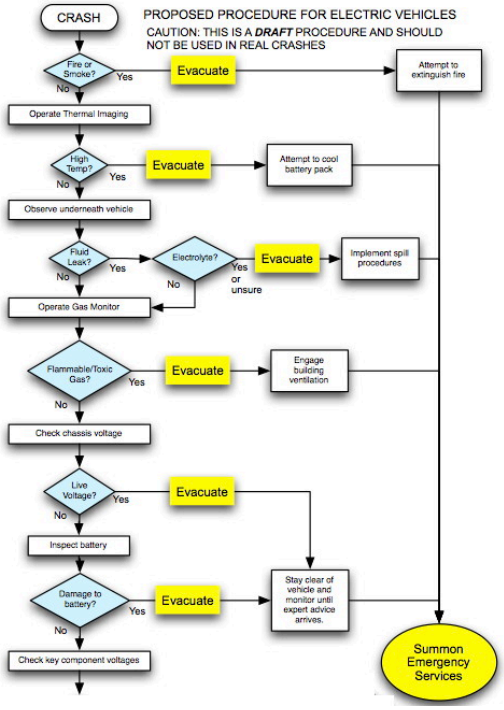
PREPARING FOR EV CRASHES

ANCAP
Crash testing for safety
AUSTRALASIAN NEW CAR ASSESSMENT PROGRAM

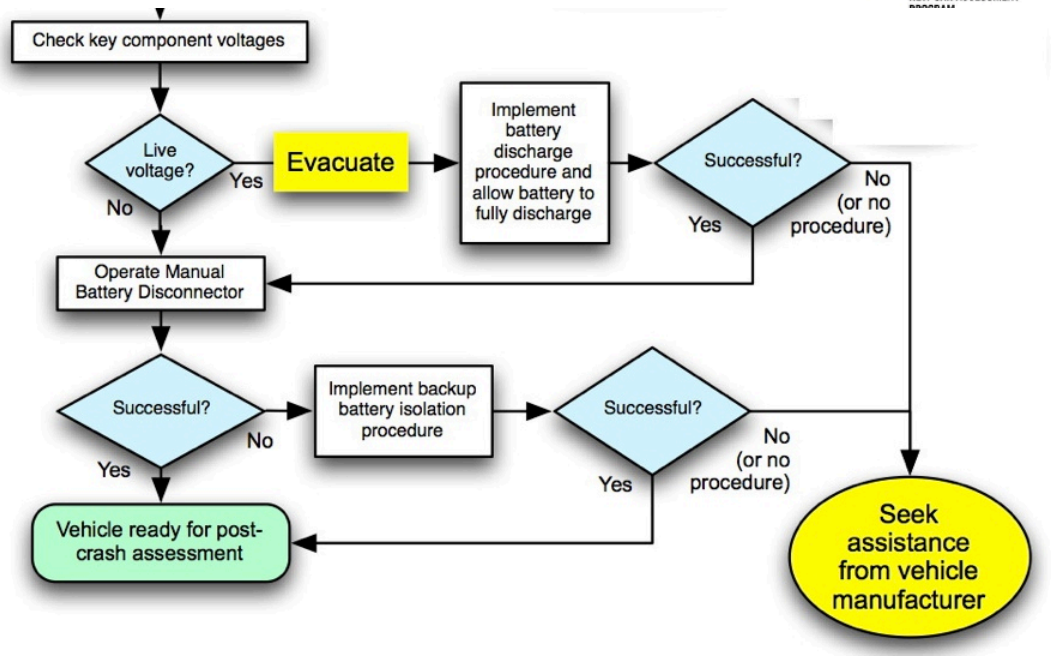
- EV manufacturers are issuing rescue manuals for emergency services personnel and conducting training sessions
- A brief review of emergency services resources suggests conflicting advice for dealing with EV fires (eg use of water)
- Better guidelines and procedures are needed
- Thermal imaging equipment and toxic/ flammable gas emission detectors are recommended for crash test labs and rescue personnel

PREPARING FOR EV CRASHES

ANCAP
Crash testing for safety
AUSTRALASIAN NEW CAR ASSESSMENT PROGRAM



PREPARING FOR EV CRASHES



Thank you to:
My co-authors:
James Ellway, Craig Newland, Stuart Worden & David Paine

and the people and test organisations mentioned in the paper