Remarks to MME attributes in ISO 13499 RED F

- **How to handle „Robustness cases"?**
  - Is robustness a separate scenario or a variation
  - Information for robustness:
    - Different targets (Car, Pedestrian with reflective vest, baby stroller,…) and multiple targets → "Class of TO"?!
    - Clutter (other vehicles and Catalog of road objects) → ?
    - Obstruction/obscurations → MME header?
    - Reference Point → see MME attribute
    - Position → see MME attribute
    - Heading → MME attribute
    - Pre-impact path / Driver input (No Steering Robot [NSR]; High beam [HB] / Low beam [LB])
    - Adverse environmental conditions → ISO is capable but Euro NCAP „Separate part of the assessment"
  - Euro NCAP uses „MME-Headers for Robustness cases"
    - Special Attribute
    - Pre-impact path
  - and enchantments to the test name:
    - Scenario Attributes

MME attributes in ISO 13499 RED F in comparison to Euro NCAP

Red F	Euro NCAP	New attribute in ISO Remark	Difference Euro NCAP and ISO Comment
.Test function side	VUT Motion	test function side gives an information of the location of the target (VUT, main line, blind spot, …) according to values in fine location 1: RI (right); LE (left); FR (front); RE (rear)	Euro NCAP uses VUT Motion as enhanced FL1 values: "FW (Forward)", RE (Reverse), LR (Lane Change Right), TL (Turn Left), DO (Dooring),… which is combination of test type and function side (DO doesn't give the side of door)
	VUT Type		There is no difference in test object codes (vehicle = 1) for C (Car), V (Van), H (Truck) --> Class of test object?
Class of test object X	Type Object Target Type	Class of test object like "VUT", "GVT", "SOV" and additional Main Locations for VRU from RED F (PDAD, PDAF, TWCA, TWSC,…+ PDBS) → This should be the place to handle different targets Do We need truck, wall,…. for obstruction and obscuration?	Euro NCAP uses specific values: "Ca (Car Average)", "Pa (Pedestrian Adult), …
Velocity test object X		actual test speed	
.Lat. vel. test object x		actual lateral test speed	
Nominal vel. test object X	VUT LongSpeed [Km/h] Target Speed [Km/h] Speed Object [Km/h]	Is a list of velocities acceptable (e.g. speed assist)?	Euro NCAP uses velocity of test object as "Desired (scenario) velocity"
Nom. lat. vel. test object x	VUT LatSpeed [m/s]	Is a list of velocities acceptable (e.g. speed assist)?	
.Nom. Accel. test object X	Target Accel. [m/s^2]	Acceleration in longitudinal and lateral? Is a list of accelerations acceptable?	
.Nom. Heading test object X	Heading Object [°] / Target Heading [°]		
.Pos. Offset test object X .Position Offset TO X	(Alternative) Position Object [cm,cm]	Refers to an offset on X and/or Y direction vs the original scenario position at the start of the test. Values as Tuple (x;y) in SI units → Should we better describe the absolute position from VUT to have a common approach?	Euro NCAP uses a similar format with cm
.VUT striking point new suggestion: .Striking point TO X	Overlap / Impact Point [%]		Necessary to add test object number? --> `.VUT striking point TO X` Euro NCAP only % vs. ISO % or ft Euro NCAP uses 1xx% instead of -xx% Should it be a tuple?

INTERNAL

MME attributes in ISO 13499 RED F in comparison to Euro NCAP

Red F	Euro NCAP	New attribute in ISO Remark	Difference Euro NCAP and ISO Comment
.Overlap VUT to TV new suggestion: .Overlap VUT to TO X	Overlap / Impact Point [%]		Necessary to add test object number? --> .Overlap VUT to TO X Euro NCAP uses 1xx% instead of -xx% Should it be a tuple?
	Reference Point Object	Reference Point Object [%-Length,%-Width] [050,100]: Reference point on 50% of the object's length and 100% of the object width (starting from the bottom left in the facing direction)	Is there a need for a tuple? Shouldn't this be always be defined in striking point?
.Lane marking function line	Lane Marking		Euro NCAP uses one descriptor for both lane markings
.Lane marking secondary line			
.Dimension of test object X	.Dimensions test object X		Euro NCAP has additional "s" in dimensions and no "of"
.VUT distance eye to end			
.VUT Shape Front new suggestion: .Shape Front TO X	.Profile-X test object X .Profile-Y test object X	the count starts on front left side; If the number of tuples is odd, the middle one must lie on the centerline of the vehicle (x1;y1) (x2;y2) (x3;y3) (x4;y4) (x5;y5) (x6;y6) (x7;y7)	Euro NCAP uses two lines
.VUT Shape Rear new suggestion: .Shape Rear TO X		the count starts on rear left side; If the number of tuples is odd, the middle one must lie on the centerline of the vehicle (x1;y1) (x2;y2) (x3;y3) (x4;y4) (x5;y5) (x6;y6) (x7;y7)	
.Environment day light			Euro NCAP: Separate part of the assessment – not to be reflected in the MME-header per se
.Road surface temperature			
.Road conditions		properties of road conditions or street or proving ground	
.Sky conditions			Euro NCAP: Separate part of the assessment – not to be reflected in the MME-header per se
.Precipitation type			Euro NCAP: Separate part of the assessment – not to be reflected in the MME-header per se
.Precipitation intensity			Euro NCAP: Separate part of the assessment – not to be reflected in the MME-header per se

MME attributes in ISO 13499 RED F in comparison to Euro NCAP

Red F	Euro NCAP	Remark	Comment
.Weather obstruction			
.Weight of obstruction			
.Wind speed			
.Position of the sun		Data format: (α; β) with α° as angle to VUT main direction and β° as angle to proving ground	
.Glare angle		Glare angle in degrees	Euro NCAP: Separate part of the assessment – not to be reflected in the MME-header per se
	Special Attribute		Euro NCAP adds here remarks like "RV (Reflective Vest)" which would fit in title or a detailed test description There is no definition to which test object this refers
	Scenario Attributes		Euro NCAP adds here values like "night" "obscuration", "Robustness",… which would fit better to subtype of test or just in title There is no definition to which test object this refers
	Pre-impact path		Euro NCAP gives here the example "NSR: No Steering Robot" which could be handled as "special attribute" There is no definition to which test object this refers