

UN/ECE GRB

R41WG

DEG conclusions

8 August 2007

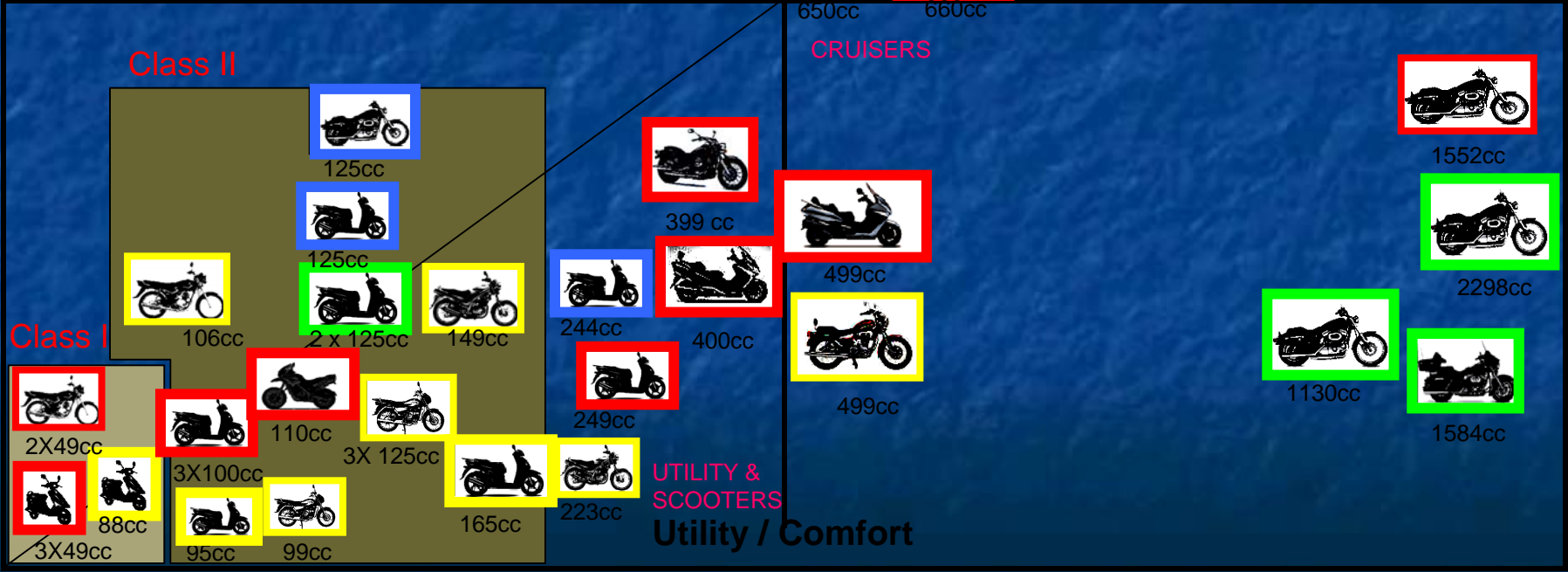
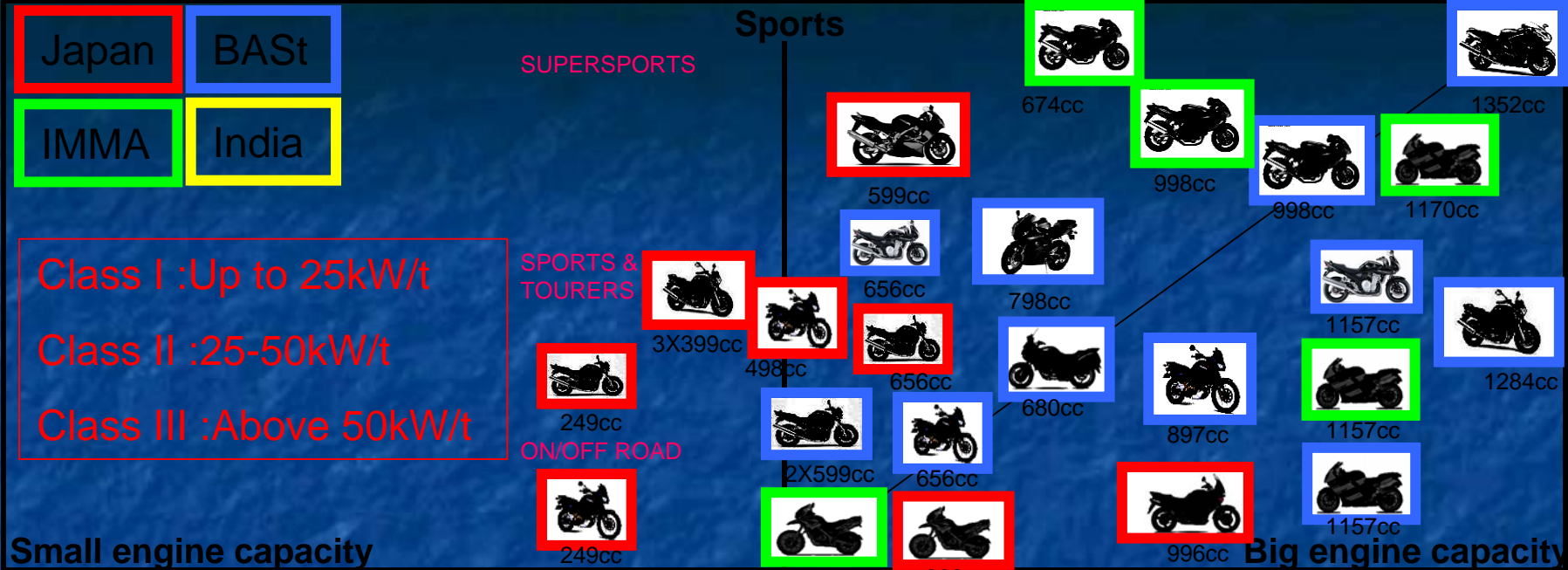
General - 1

- In February 2007, GRB agreed:
 - That ISO362-2 is practical and repeatable
 - To increase the number of MCs in the database to 60 (from an original sample size of 33)
 - That the database is diverse and broad enough and that R41WG/DEG should prepare the data for a limits discussion (standstill limits and reduction effects; cost-efficiency modelling ideas; consequences for resources (equipment, time))
 - That R41WG/DEG should collect more ASEP data (to define ASEP limit line and the PMR exclusion cut-off value)

General - 2

- From April to July 2007, ASEP tests were conducted by Japan & IMMA
- Meeting on 2 July 2007 to check data collection process
- 4/DEG meeting on 7/8 August to analyse data and prepare material for R41WG and GRB in September 2007

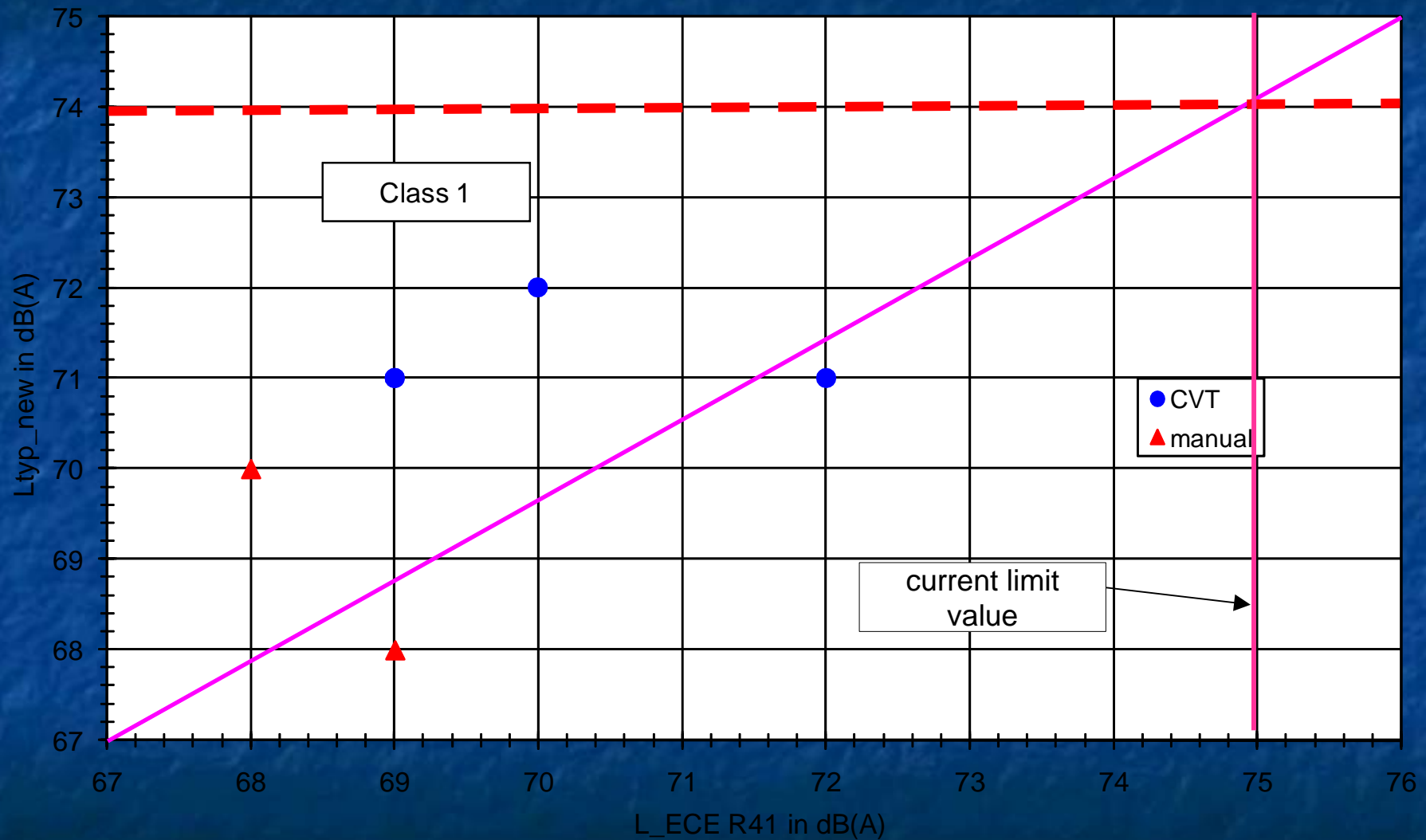
R41 – ISO correlation



Standstill limit values

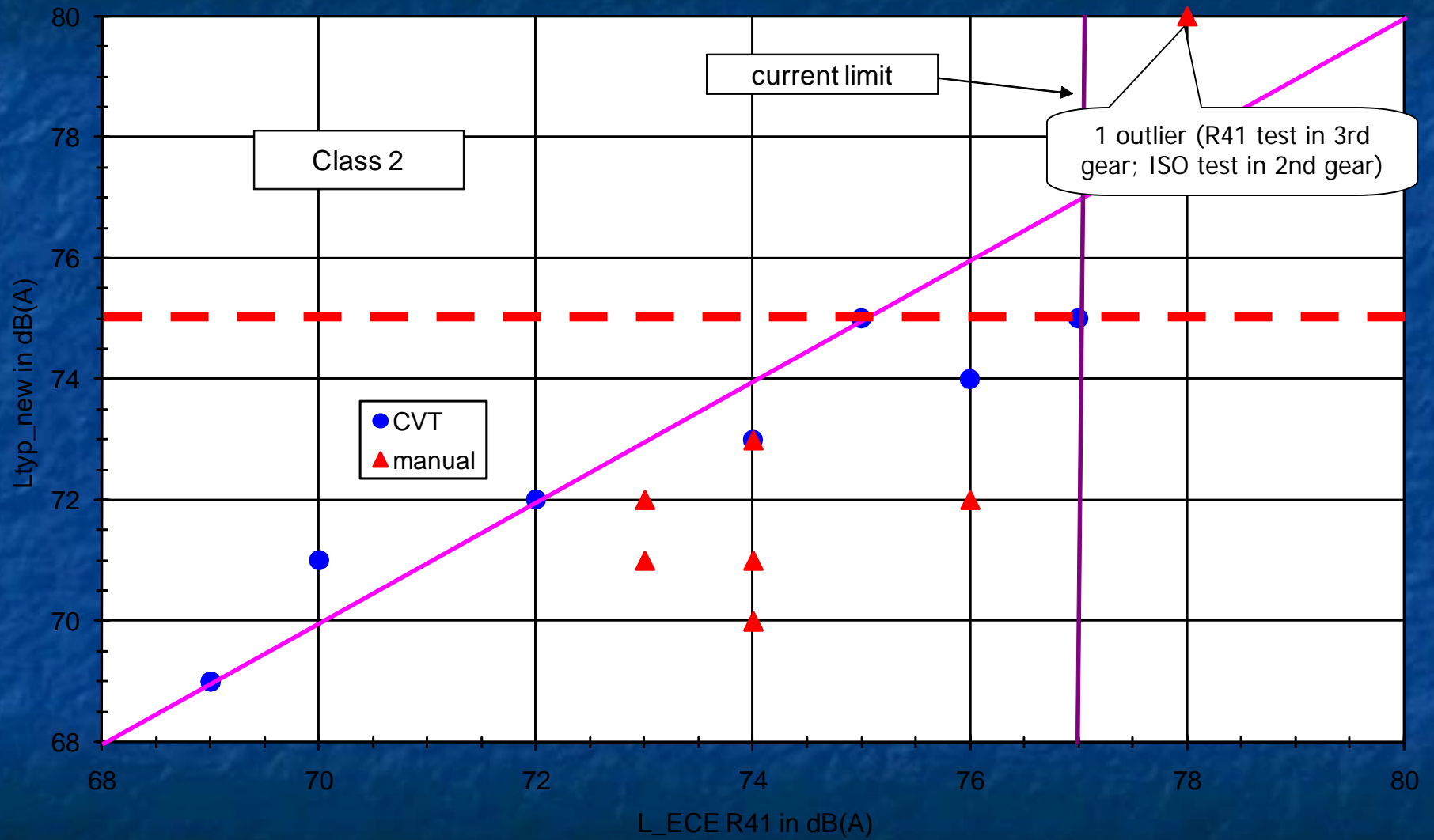
- Standstill limit values are those which give the same degree of severity as the R41 limit values taking into account the change in the test procedure
- These values were calculated from the Lurban noise levels that correspond to the highest valid R41 noise test result (keeping any difference between the R41 result and its limit value)

ECE R41-03 vs ISO 362-2



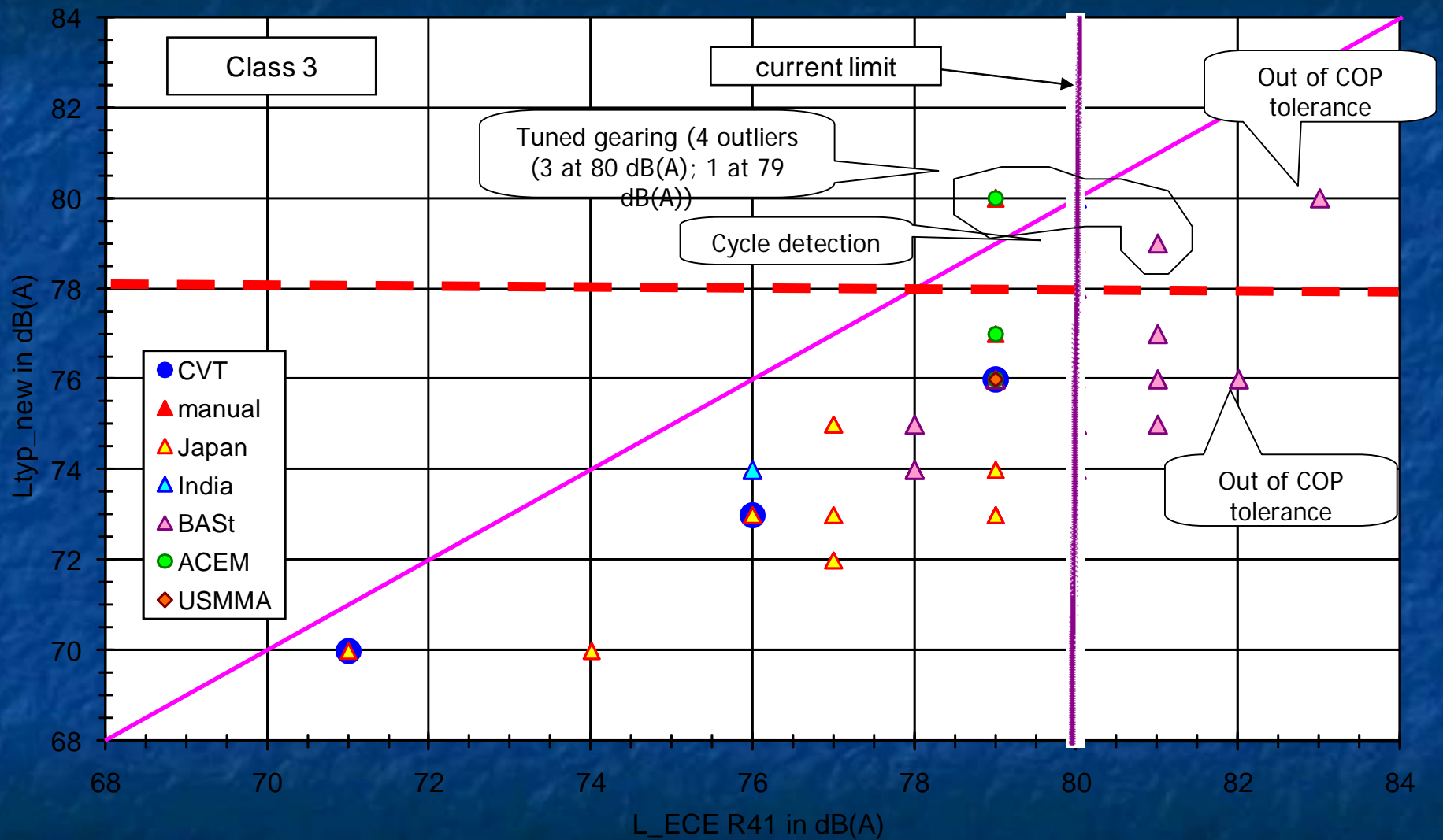
Standstill limit 

ECE R41-03 vs ISO 362-2



Standstill limit 

ECE R41-03 vs ISO 362-2



Standstill limit ----- Deletions = 2(COP) + 1 (cycle detection) + 4 (gearing) (filter: $L_{ISO, WOT} - L_{ECE} > 2$ dB(A))

Standstill limit values

	ECE R41		ISO 362-2		Vehicles excluded (%)
	Class	Limit (dB)	Class	Limit (dB)	
Class 1	-80cc	75	< 25 kW/t	74	0 (but reduced margin relative to limit)
Class 2	80-175cc	77	25-50 kW/t	75	13
Class 3	175cc-	80	> 50 kW/t	78	16

Cost-effectiveness analysis

- Qualitative benefits exist (more robust test procedure for OE and RESS, excluding number of existing models at standstill limits)
- Most existing ambient noise prediction models do not cover MCs; the limited number of models that do cover MCs show that Leq contribution from MCs is small except for cities with high MC population
- Reliable quantitative cost-effectiveness analysis of reduction scenarios beyond standstill limits not possible although costs could be assessed

Consequences for resources

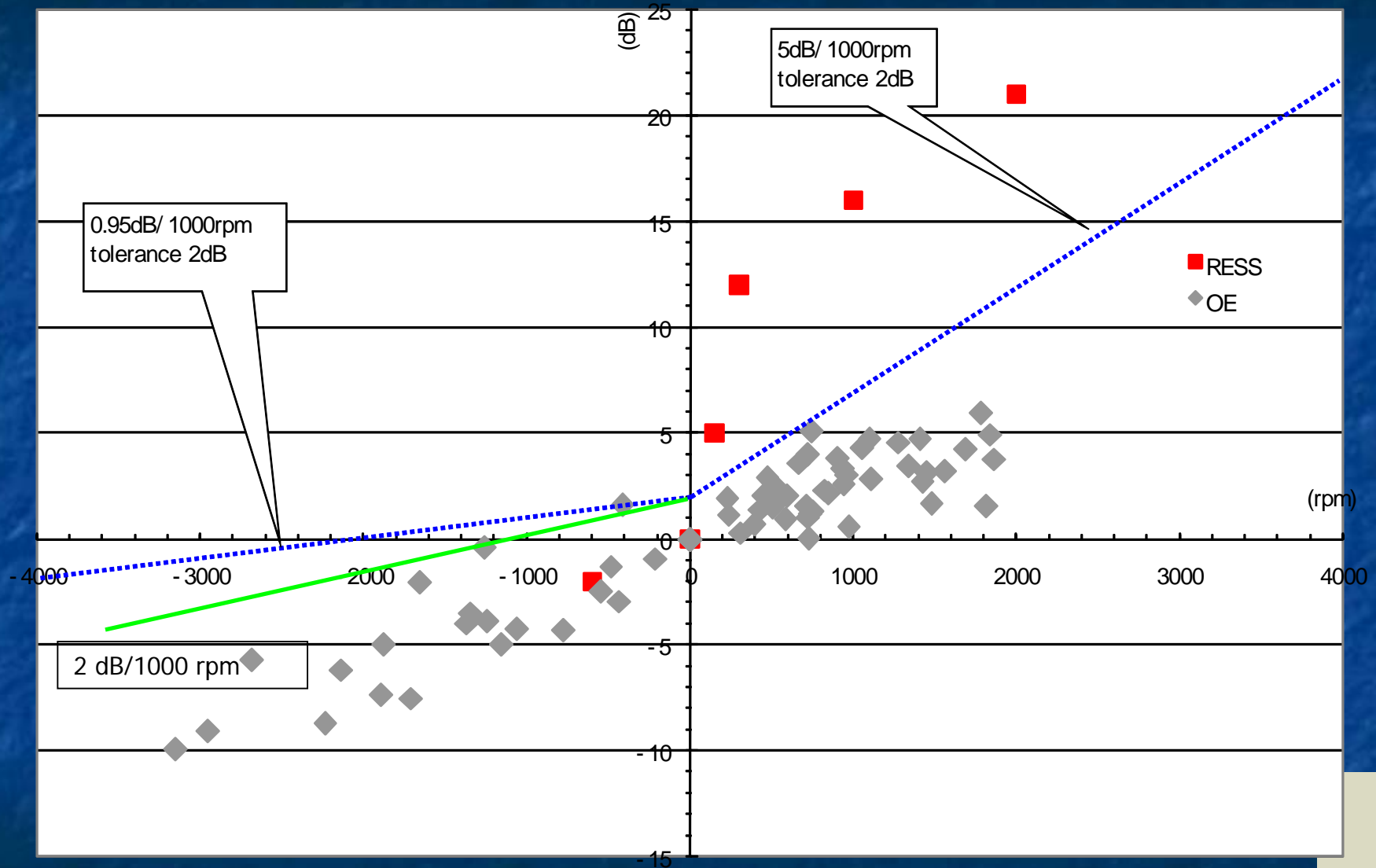
- Potentially more lengthy/costly but offset by:
 - Duration of noise tests small compared to overall noise test session (eg. travel to and from test site; test site set-up; establishing entry speed; ...)
 - Increasing experience for testers and preparatory deskwork
 - Reducing # test runs from 4 to 3
- Higher equipment specifications needed but already commonplace

ASEP campaign results

General

- Tests to the latest ASEP test protocol were done by Japan and IMMA
- 25 MCs were used (61 to 385 kW/t)
- ASEP data was analysed by linear regression to establish the noise increase/decrease slopes

ASEP limit line

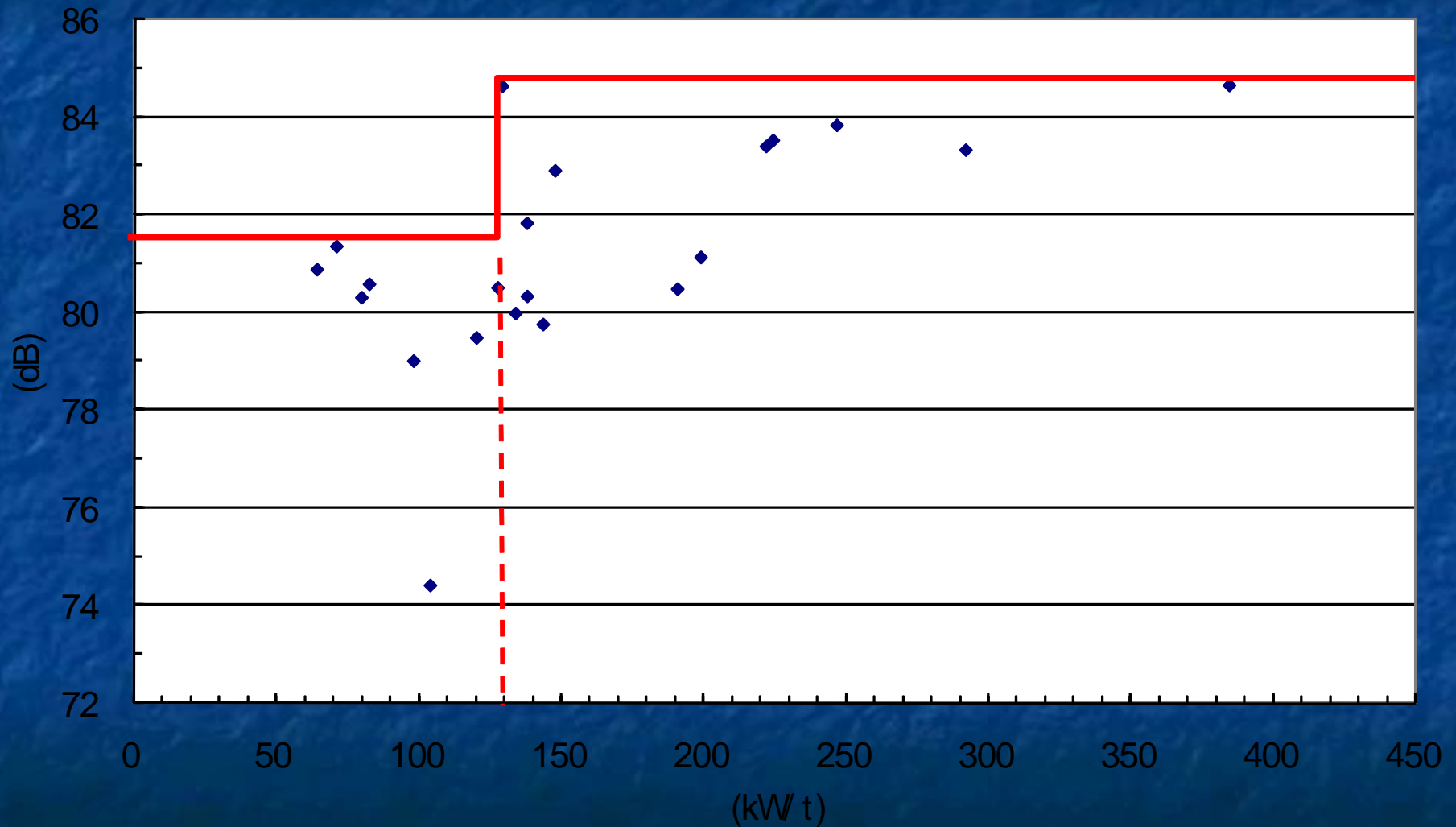


$$L_{\max}(n) = L_{\text{wot } i} + 5 * (n - n_i) / 1000 + 2 \text{ dB } (n > n_i)$$

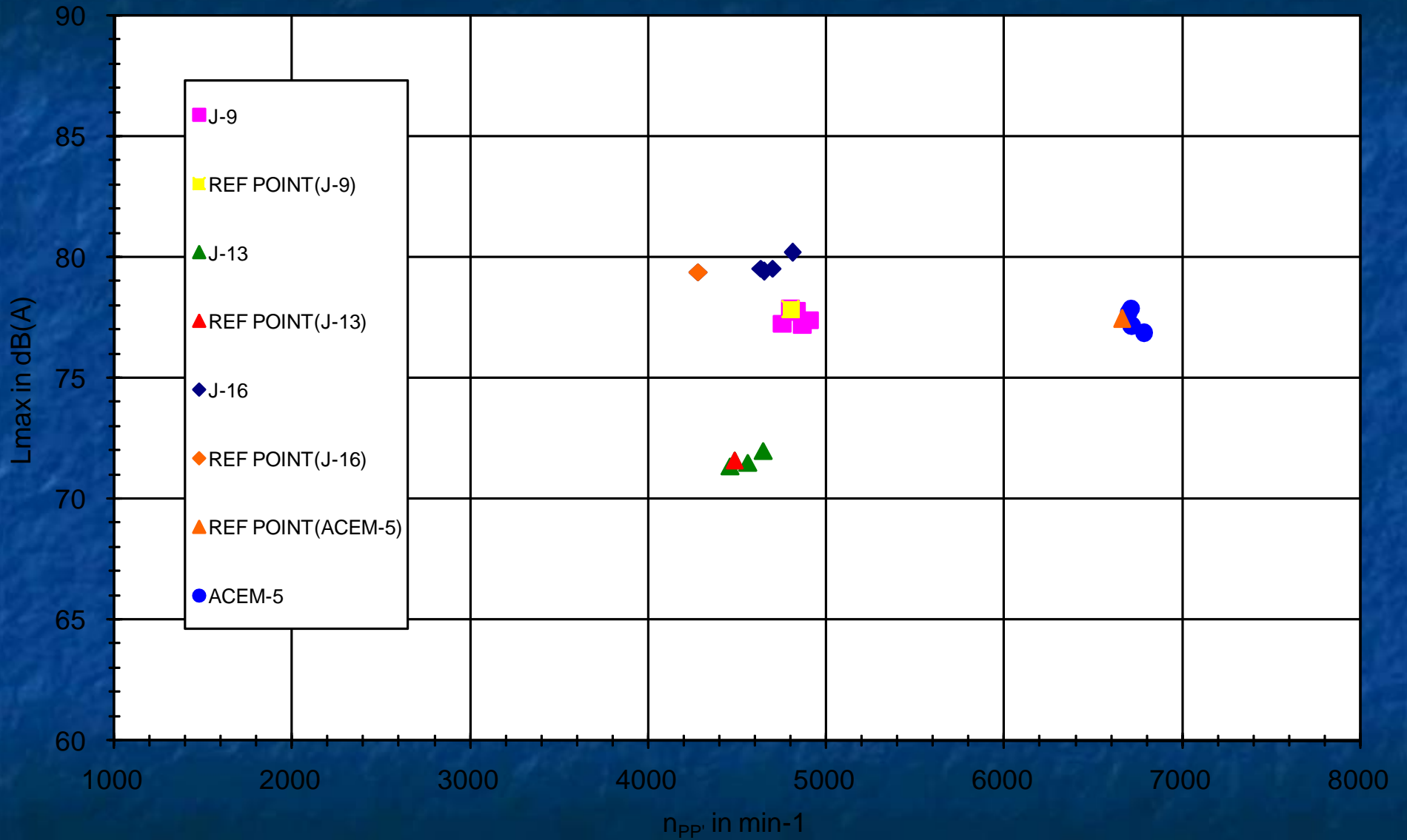
$$L_{\max}(n) = L_{\text{wot } i} - 0.95 * (n_i - n) / 1000 + 2 \text{ dB } (n < n_i)$$

Exclusion of MCs with PMR below 130 kW/t

ASEP_1



Exclusion of CVT MCs



Enforcement testing

Enforcement options

- At international level:
 - Type Approval & Conformity of Production
- At national level:
 - Stationary test with reference value
 - Drive-by acceleration test with reference value (DEG awaits BAST research conclusions)

Summary

Base TA test				ASEP test (R41WG to discuss its use)	Roadside enforcement (via national implementing legislation)	Tampering		
ECE R41		ISO 362-2		Vehicles excluded (%)	+5dB/1000rpm -0.95dB/1000rpm 2dB tolerance	Stationary	Drive-by	Prohibition of easily removable parts
Class	Limit (dB)	Class	Limit (dB)					
-80cc	75	< 25 kW/t	74	0 (but reduced margin relative to limit)			[Entry speed estimated on speedometer]	Tightening the type approval of RESS
80-175cc	77	25-50 kW/t	75	13	Other issues: - 3 runs instead of 4 - family concept for class boundaries (lowest PMR version to be tested with corresponding lower class limit)			
175cc -	80	> 50 kW/t	78	16				