Feasibility and Repeatability of the Sled Test in AECS-Annex 7

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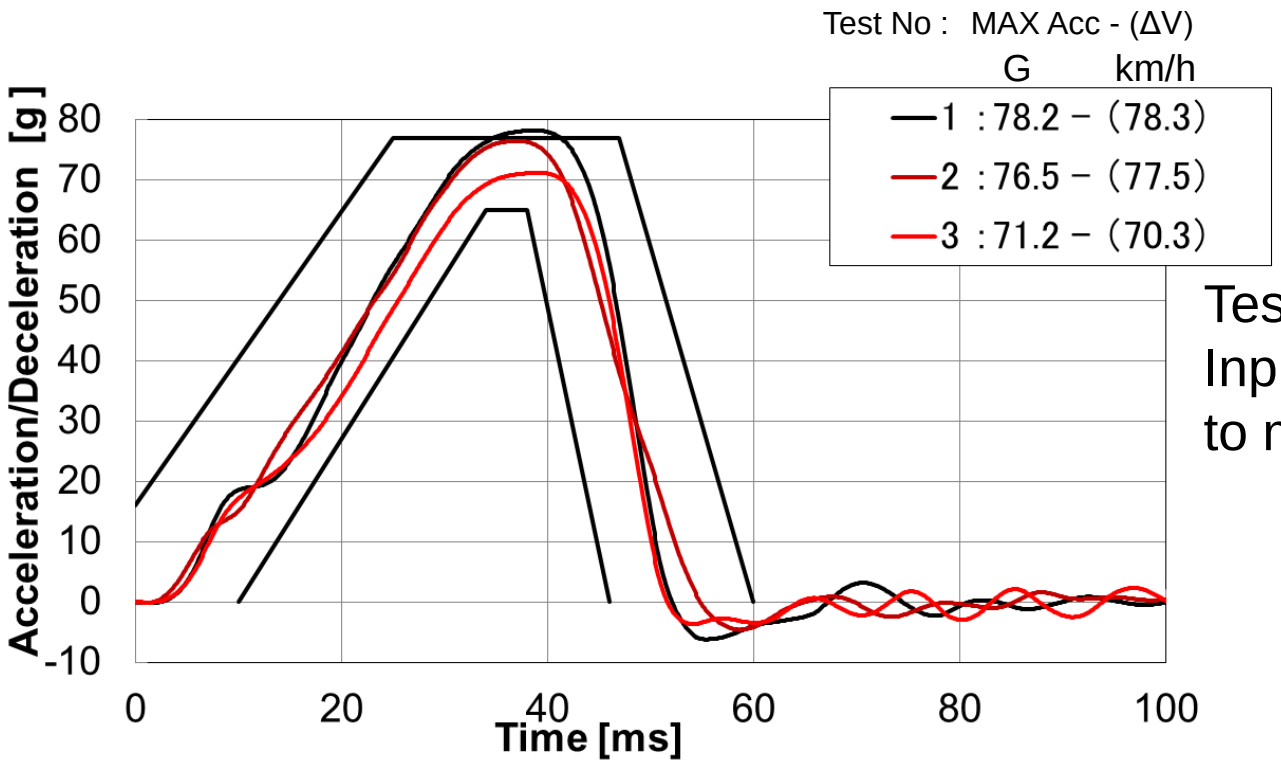
Contents

- Purpose: To verify the feasibility and repeatability using the accelerated-type sled device.
- Verifications:
  1. Feasibility
     * Test pulse within the corridor?
     * Velocity changes ΔV meet 68-70 km/h?
  2. Repeatability
     * Verified with an AECD component weight of 100 kg taken into account.
- Concerns
- Conclusions
- Proposed amendment of the corridor line.

Results for Feasibility



Tests No.1 - No.3:
Input pulse was changed to make the test feasible.

Test No	Corridor	ΔV	Result
1	*	Fail	Upper limit of the corridor exceeded; ΔV limit exceeded
2	✔	Fail	Within the corridor; ΔV limit exceeded
3	✔	*	Within the corridor; ΔV adjustable

*If adjusted, the ΔV will be within the required range.

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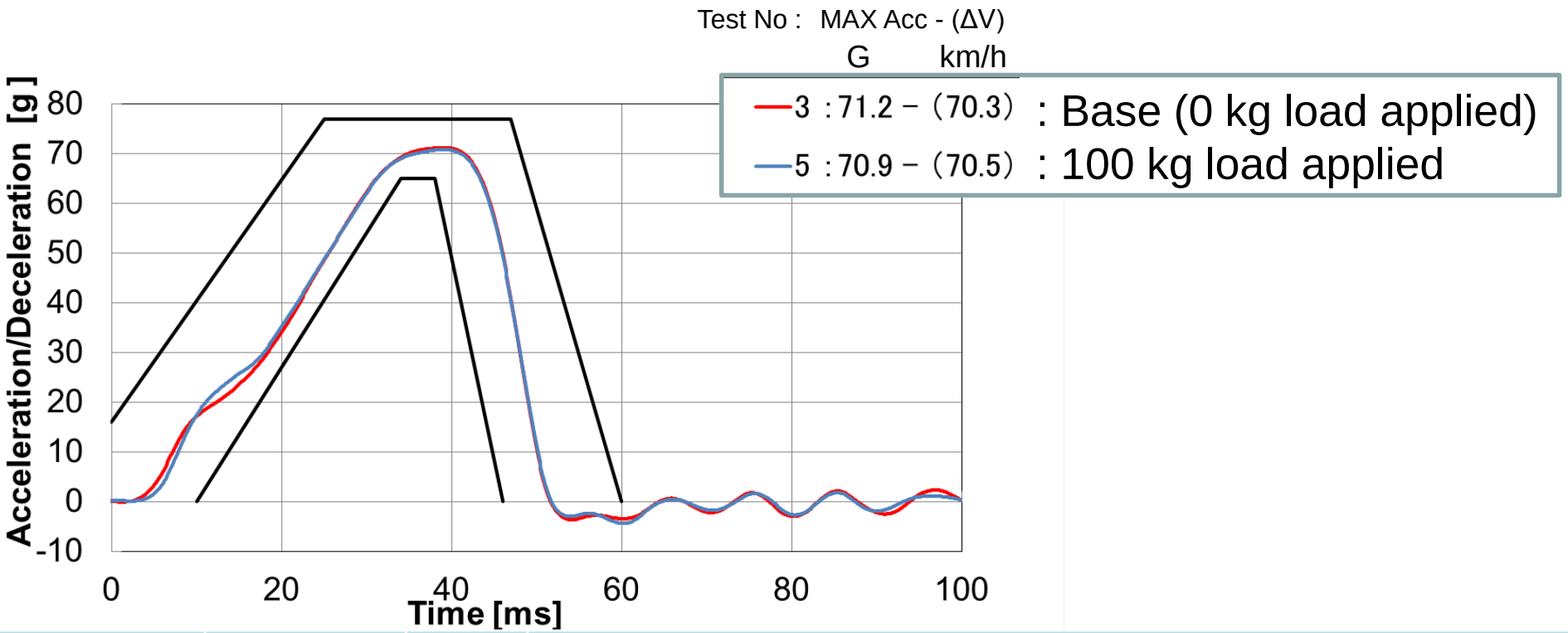
Results for Repeatability

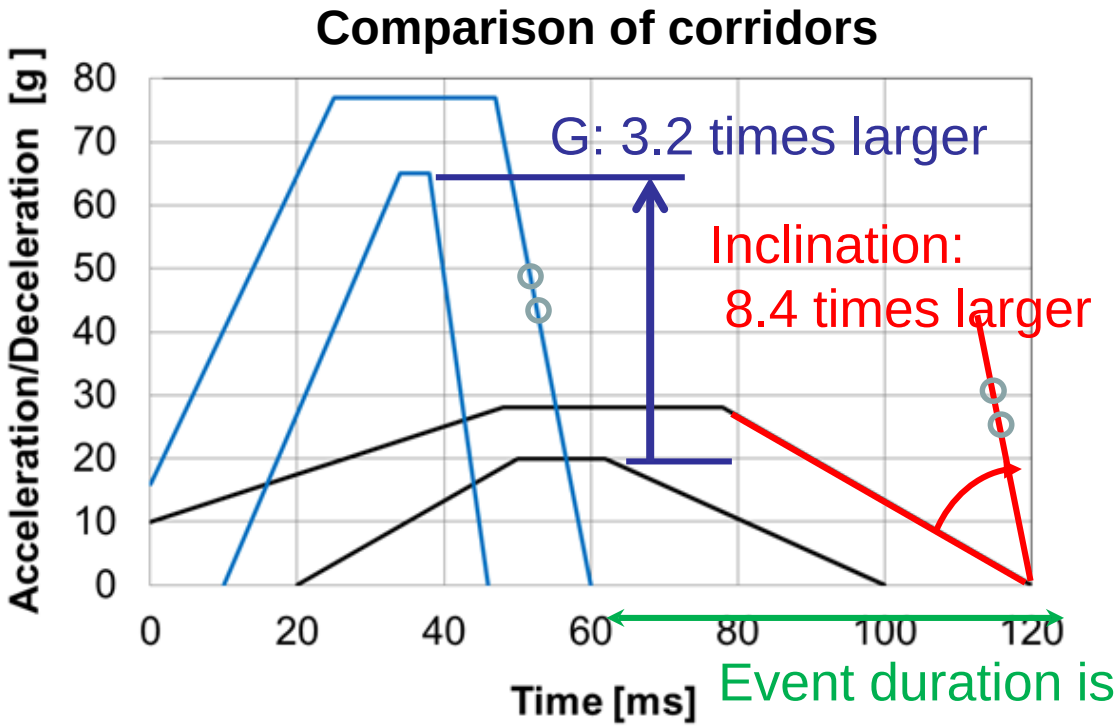


Test No	Corridor	ΔV	Result
3	✔	*	Base waveform
5	✔	*	Almost agreement with the base waveform (#3)

*If adjusted, the ΔV will be within the required range.

Concerns (Comparison with R17,R44,R100-02)

- In comparison with the other Regulations, the load to the sled is extremely high (leading to generation of a large amount of brake dust as well as a little smoke and odor due to brake friction, which is unlikely in tests of the other Regulations).
- The sled brake system could be damaged because this test is conducted at more than 80% of the capacity of the maximum specification.



Corridor
Blue :AECS
Black :R17,R44,R100

Event duration is shorter (0.5 times).

Conclusions and measure

Conclusions

- The feasibility and repeatability of sled test were confirmed.
- However, the load to the sled was found to be extremely high, causing concerns about the possibility of the braking system being damaged if testing is conducted continuously.

- Compared with the sled tests of other Regulations (*R17,R44,R100-02*), the AECD sled test has the following characteristics:
  - •Shorter event duration (0.5 times);
  - •Peak acceleration (3.2 times);
  - •Rapid deceleration after the peak G (8.4 times).

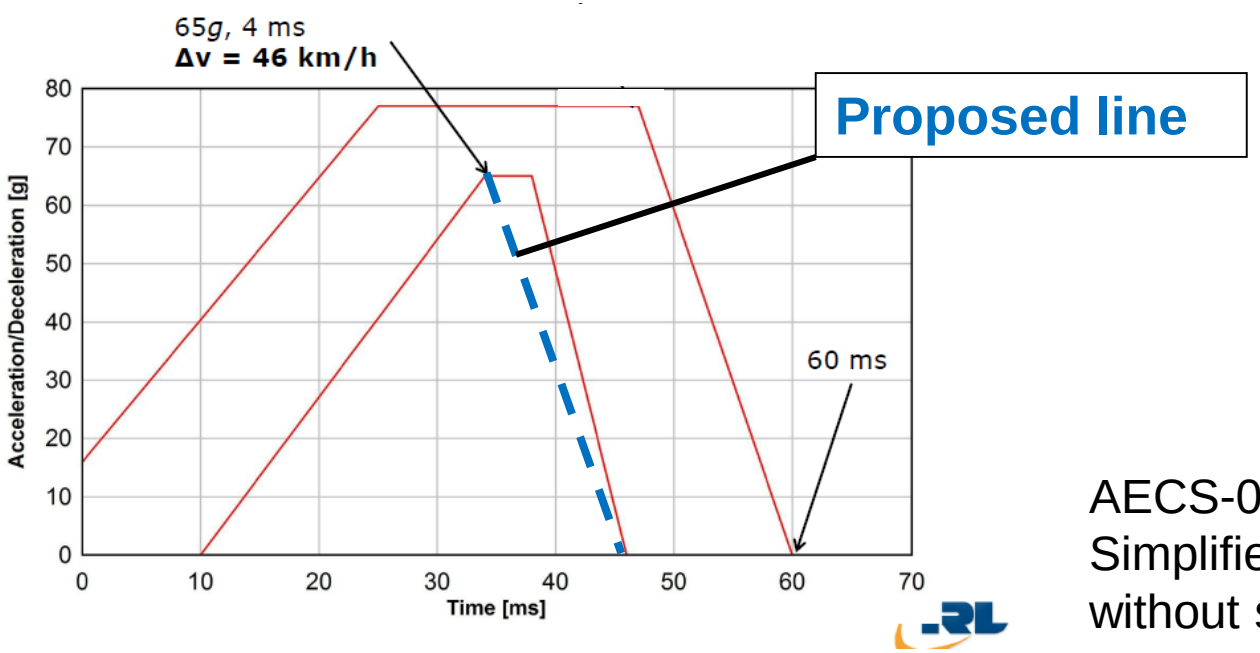
Measure

- **It is necessary to propose minor amendment for rapid deceleration in the current corridor that can mitigate the damage of the accelerated-type sled device.**

Proposed amendment corridor

■ Japanese proposition：a dashed line in the figure.

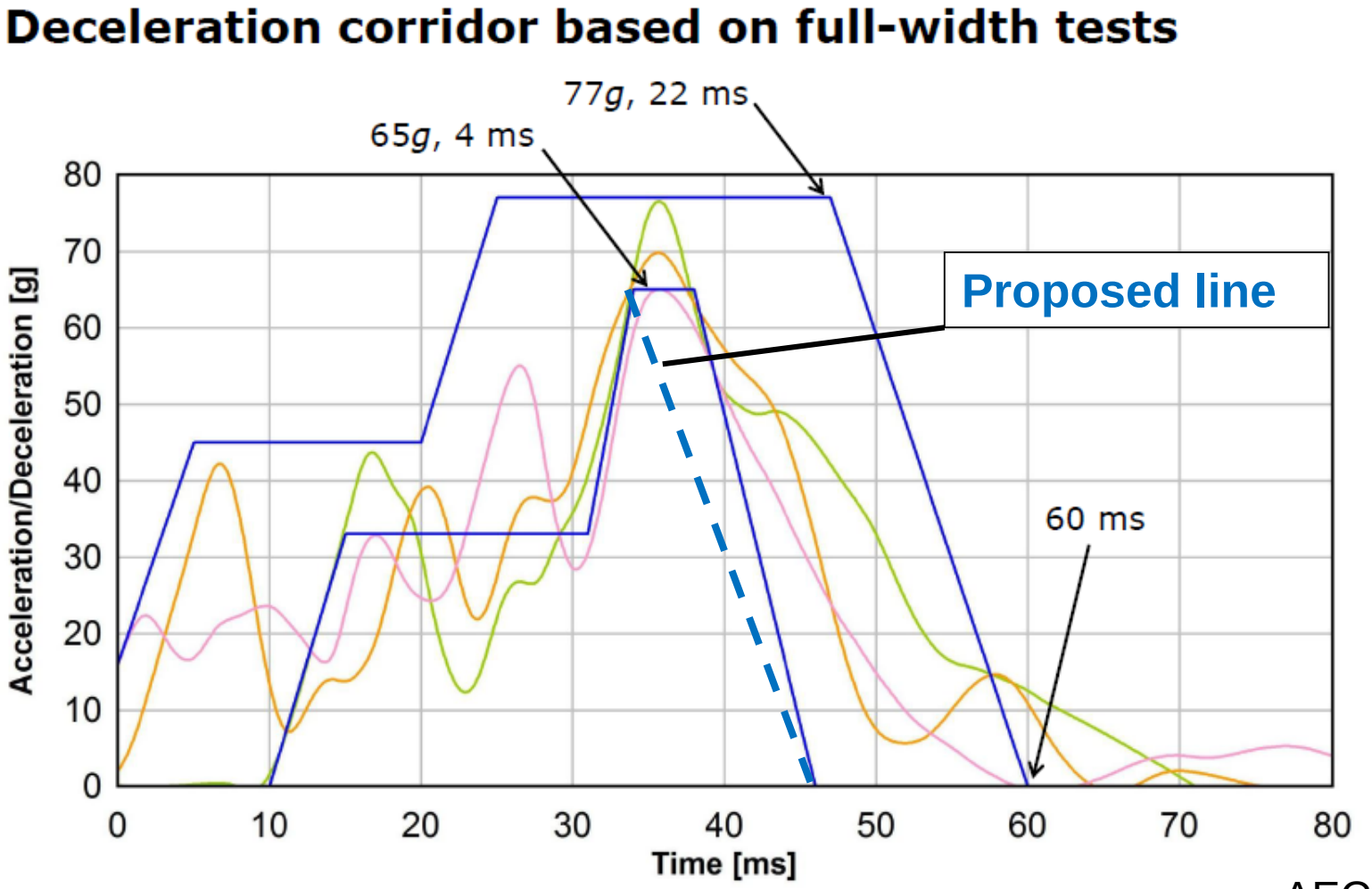
- This will give more freedom to the test pulse form.
- Therefore, this can mitigate a possibility of damage to the brake system of accelerated-type sled device.
- Maximum acceleration 65 G of the lower corridor is kept as TRL proposal.
- The velocity change ΔV 68-70 km/h is kept.



AECS-08-09 (TRL)
Simplified Corridor
without safety factor

Page ▪ 2

Reference



AECS-07-05e

Thank you!