M107 .50 Caliber COTS/NDI Sound Suppressor Evaluation

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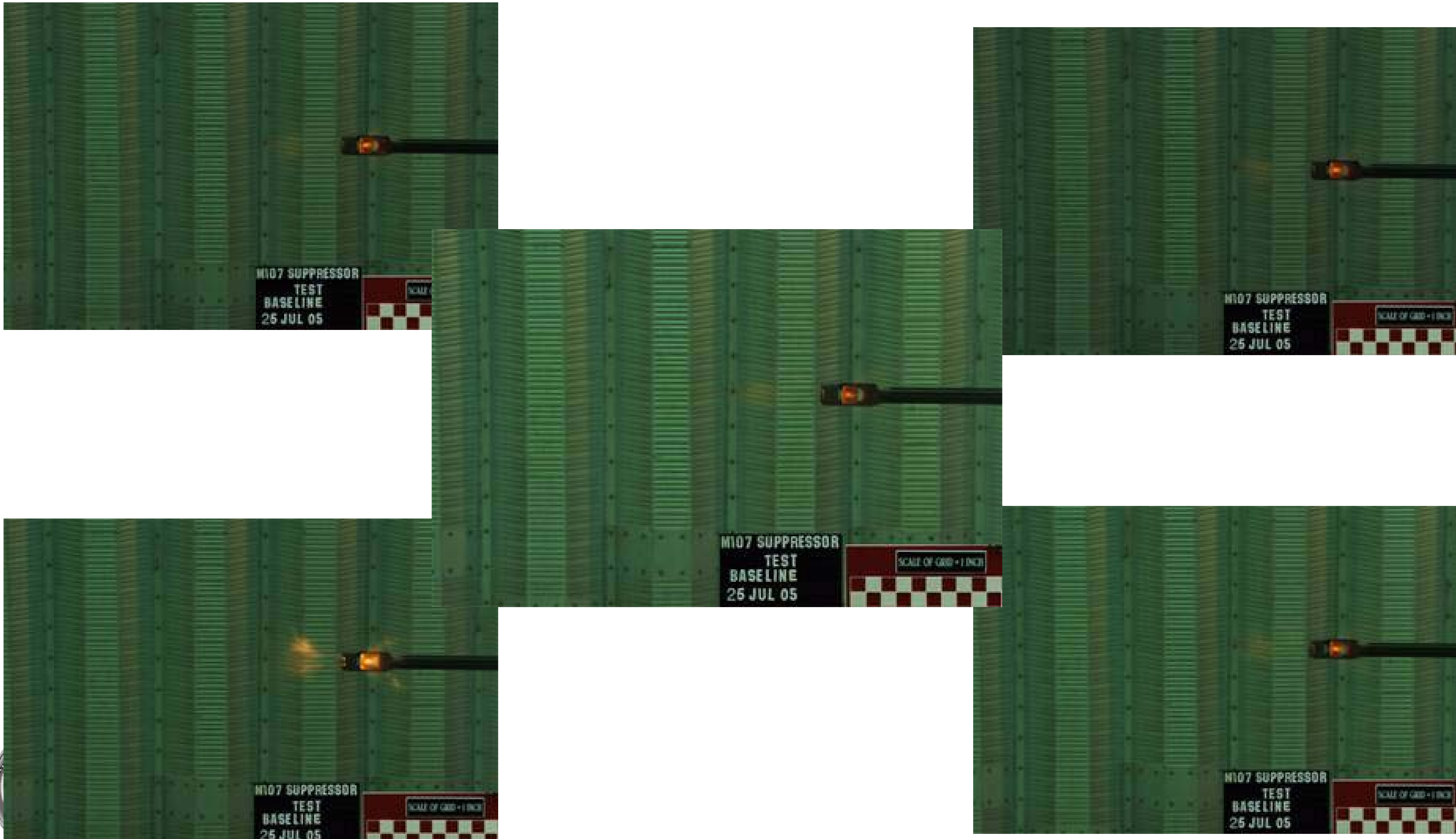
Objectives

- Debrief demonstrated performance of M107 .50 caliber suppressor samples submitted for government bid sample testing.
- Review general shortcomings, positive performance areas, and soldier feedback.
- Observations on suppressor design and affect on demonstrated performance

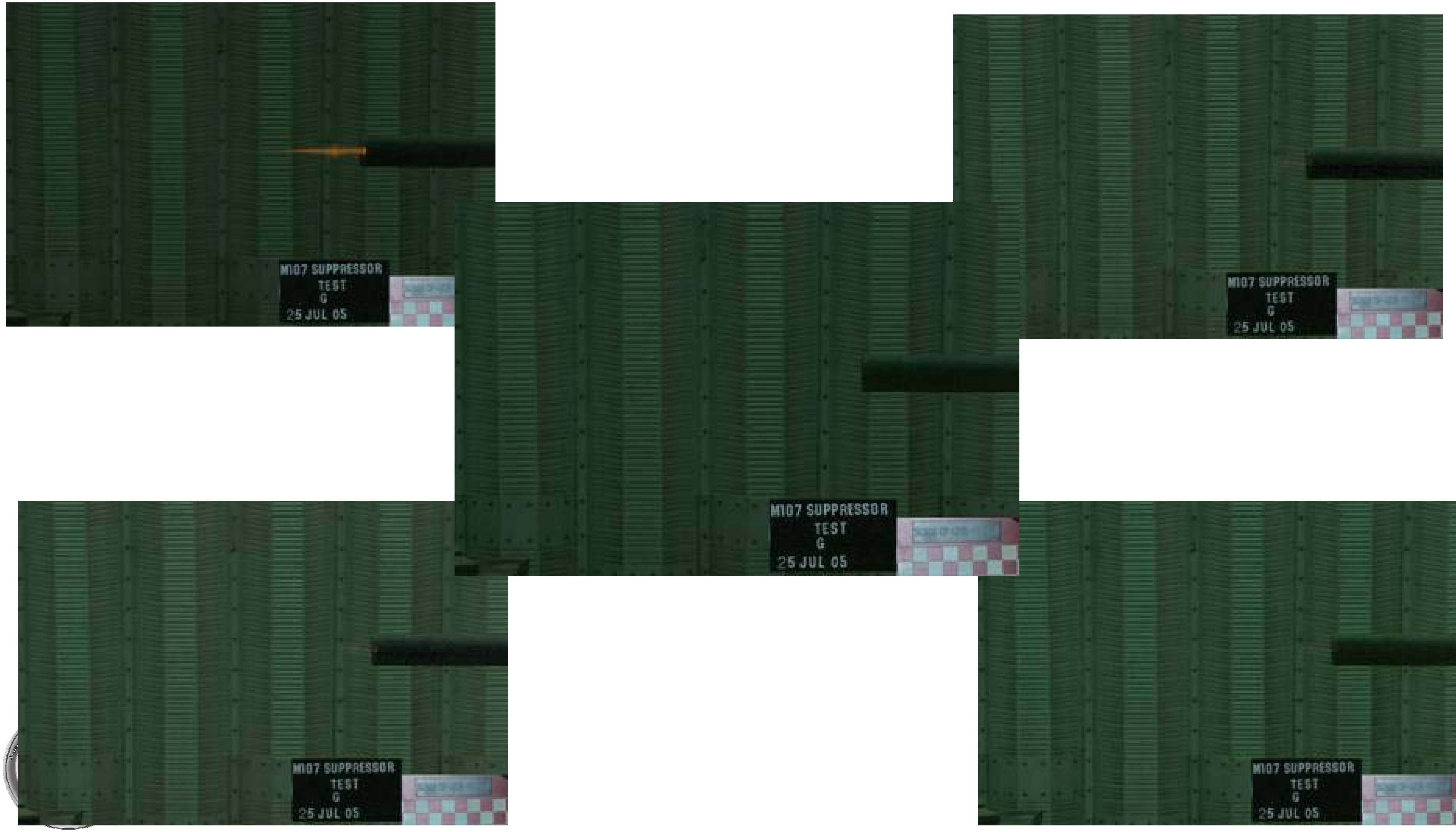
Test Lineup

- **Flash** – cross sectional area measured using high speed photography
- **Sound** – peak SPL recorded using digital oscilloscope at five (5) positions
- **Muzzle Blast** – ground disturbance area below suppressor
- **Recoil** – recoil energy (ft-lbs)
- **Accuracy/Dispersion** – five 10 round targets at 500 meters and 1000 meters.
- **Reliability** – 1,000 rounds per candidate, stoppages and failures were recorded
- **Limited User Evaluation** – Army and Marine Snipers

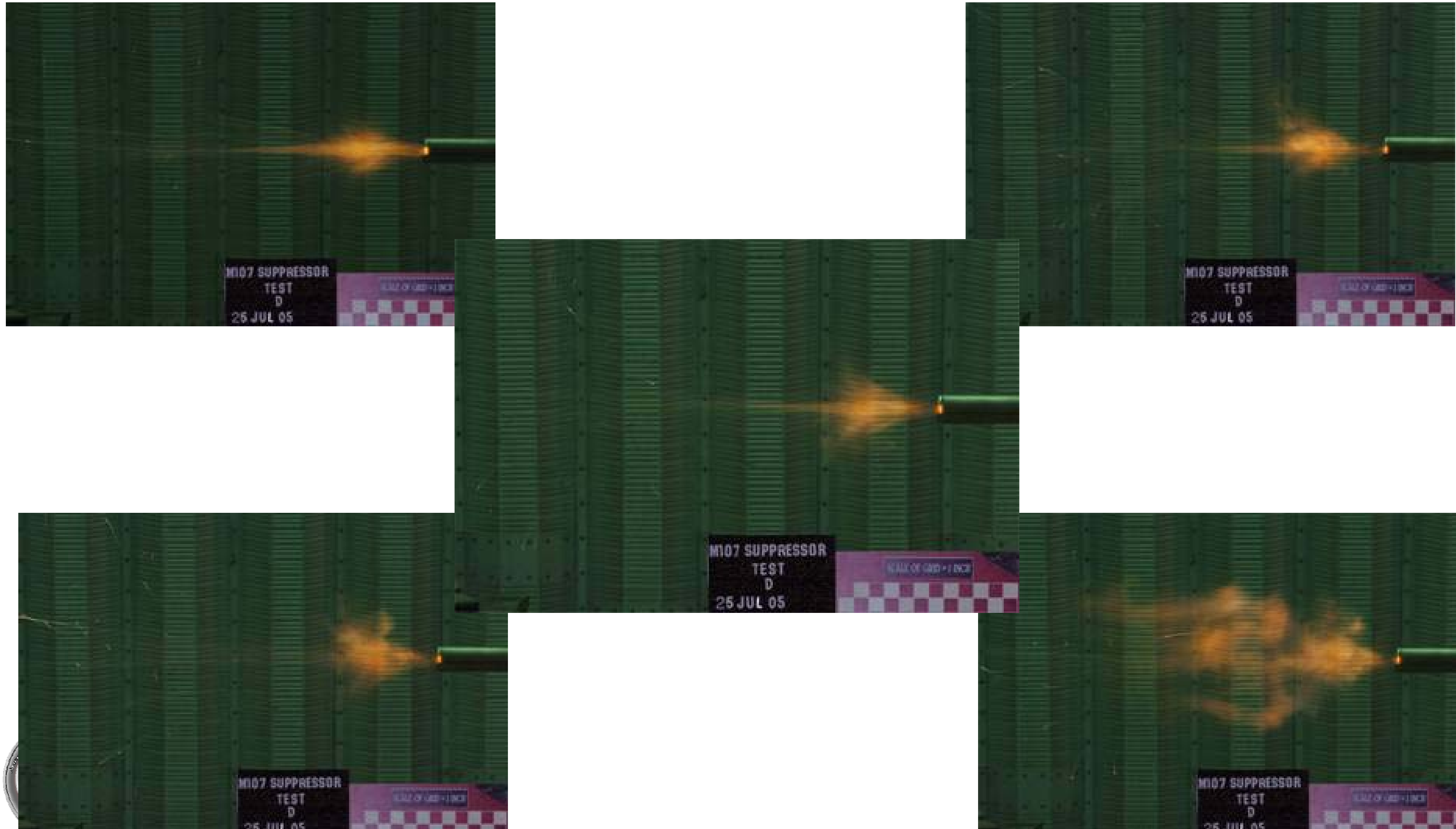
Flash (baseline)



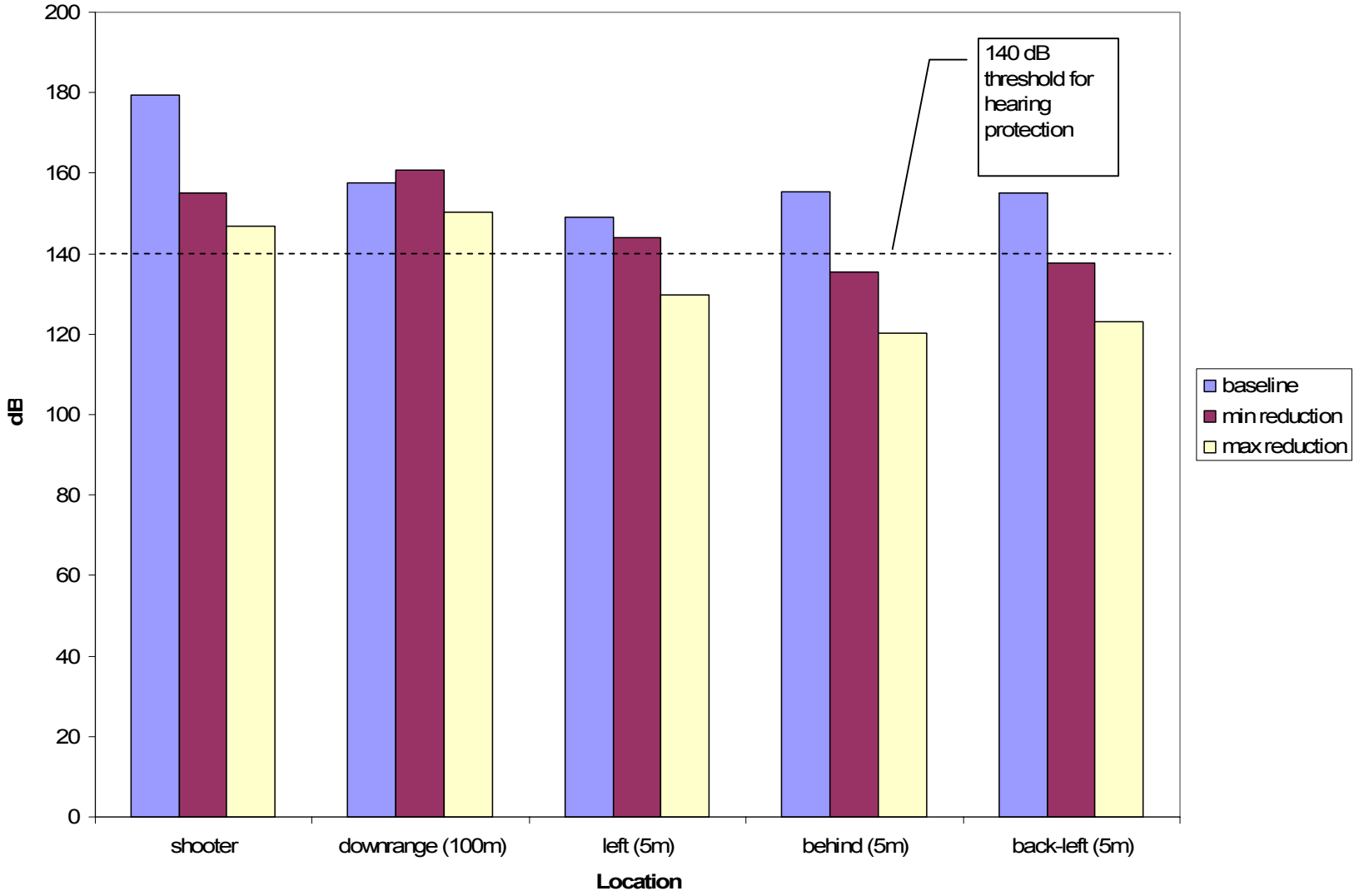
Flash – Candidate Suppressor



Flash – Candidate Suppressor



Peak Sound Pressure Level vs. Location



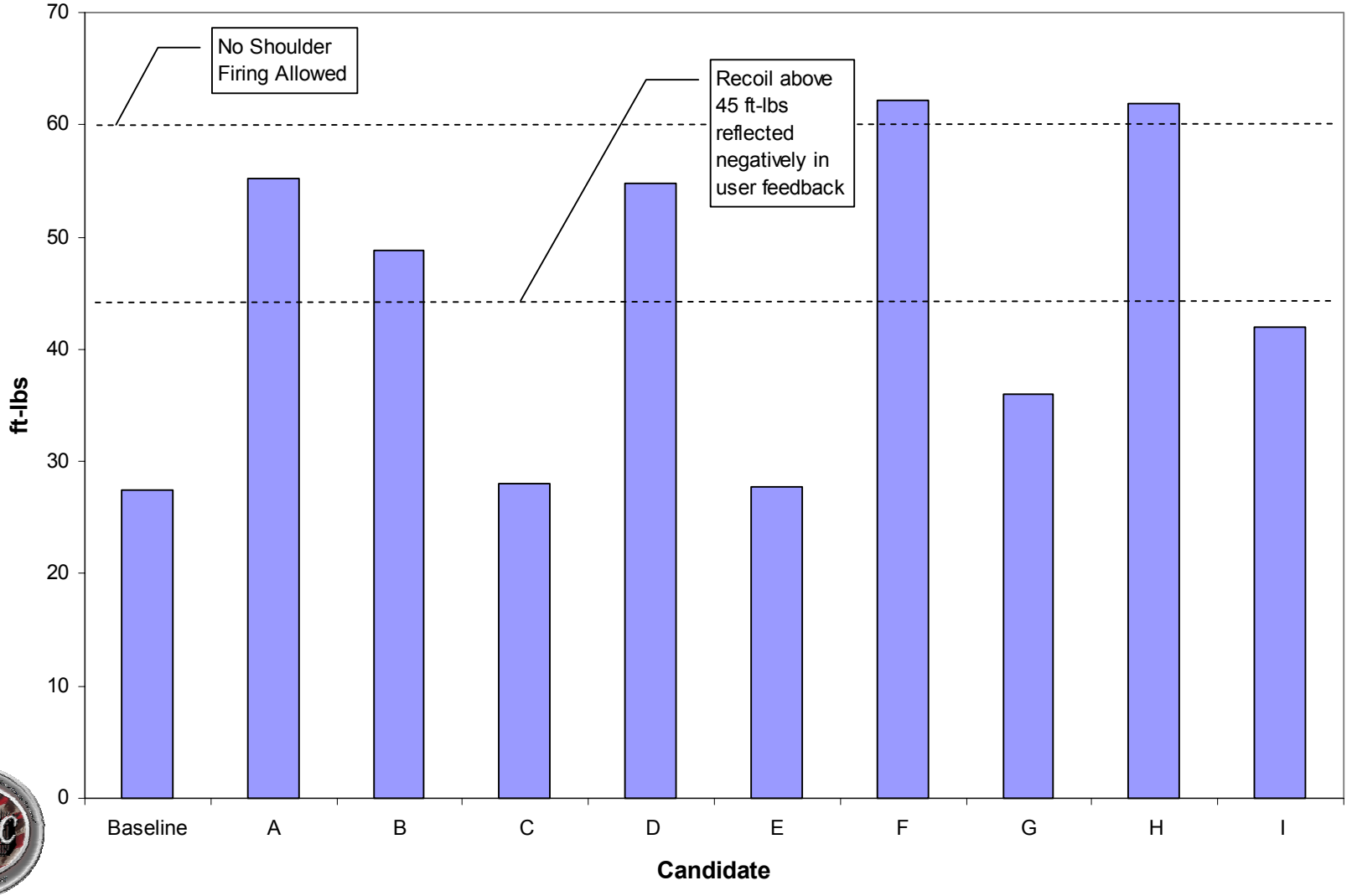
Reliability

- Overpowering changed the dynamics of the “well tuned” M107 baseline system increasing operating group velocities and stresses
- Broken extractors and cracked charging handles were common
- Frequent stoppages (FFD, FXT) experienced during TT and by Soldiers during LUE

User Evaluation Feedback

- Recoil level in excess of 45 ft-lbs reflected negatively
- Blowback
- Muzzle heavy situations reported above 5 lbs
- Quick attach/detach a must

Recoil Energy



Shot Sequence

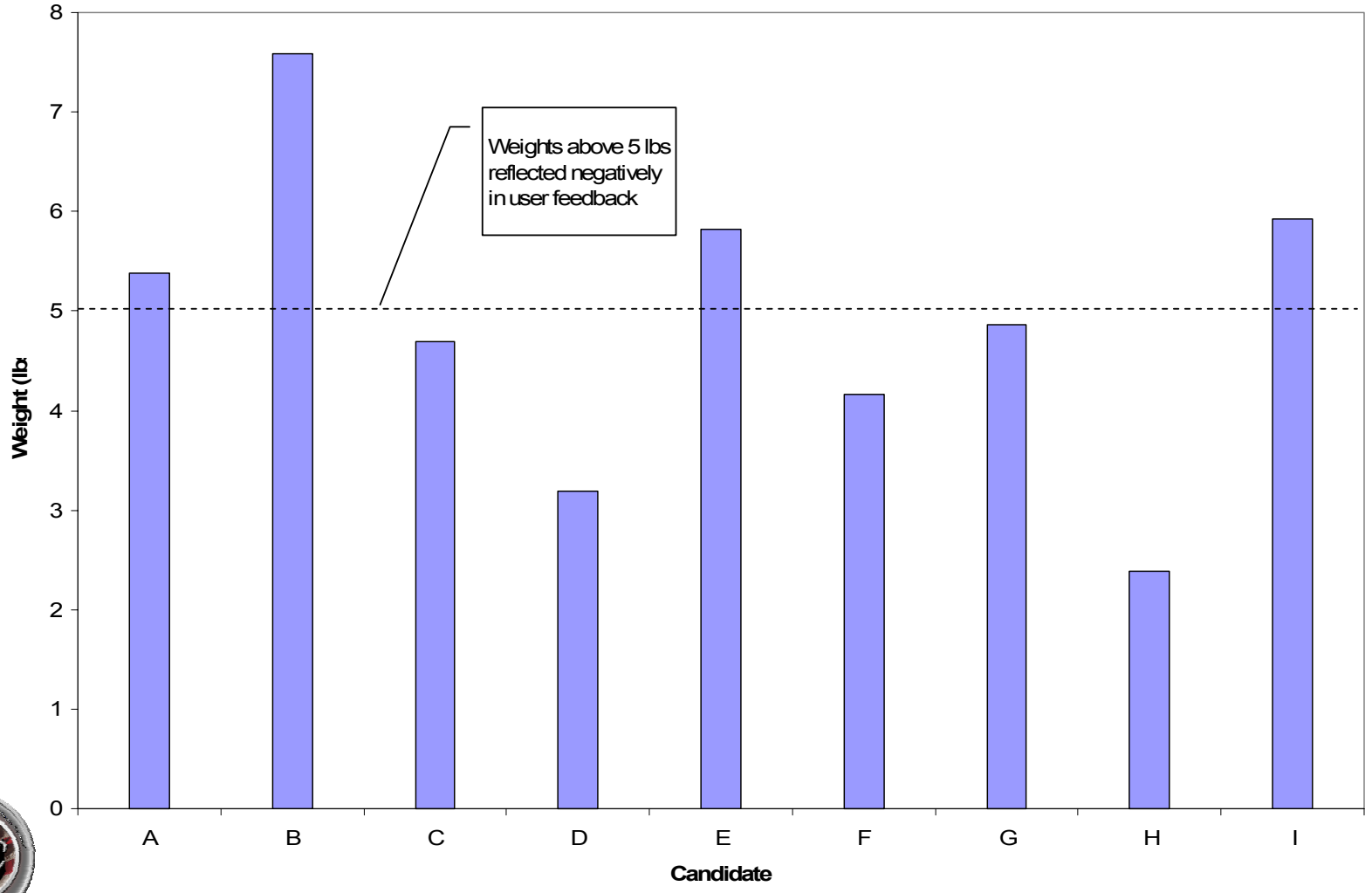
1.

2.

3.

4.

Suppressor Weight



Observations

- Drastic increases in recoil energy produced an overpowering situation resulting in stoppages and premature component failures.
- Expansion tank designs generally produced more blowback than designs that shifted sound frequency outside of the audible frequency range.
- Designs that shifted sound frequency produced excessive recoil energy levels.