

E190 Second Generation and CS100 Predicted Noise Levels



The purpose of this presentation is to substantiate that certificated noise levels for CS100 and E190 Second Generation aircraft will tend to be very similar due to some common design specifications

E190 Second Gen. and CS100 Predicted Noise Levels



← C Series CS100 and E-Jets 190 Second Gen.

- Both are under development
 - Noise levels are still predicted numbers
- Same engines (PW1000G PurePower family)
 - Same take-off thrust
- Similar design weights
- Comparable wing span and area
- Similar high-lift aerodynamic characteristics



CS100

- MTOW: 58,967 kg
- MLW: 50,802 kg
- Wing area: 113.2 m²
- Wing Span: 35.1 m
- Fuselage length: 35 m
- Single flaps
- Leading edge slats

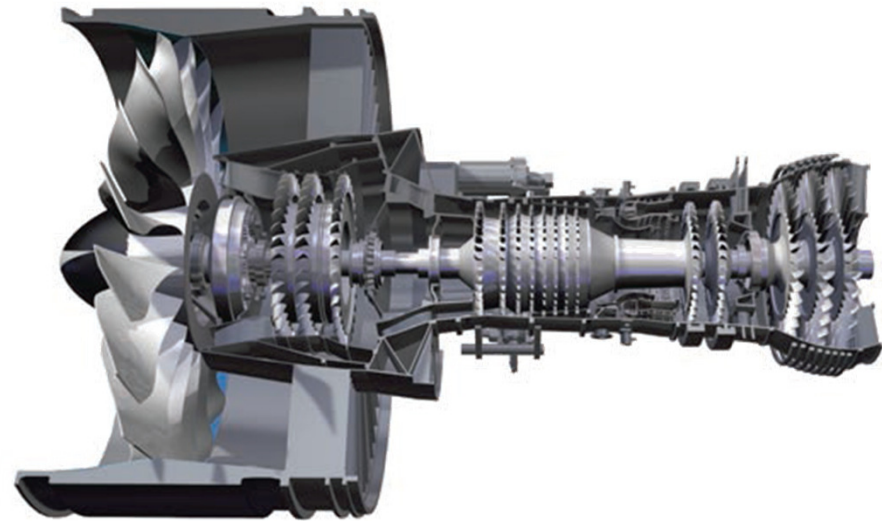
E190 Second Gen.

- MTOW: 56,900 kg
- MLW: 49,450 kg
- Wing area: 103 m²
- Wing span: 33.7 m
- Fuselage length: 36.2 m
- Single flaps
- Leading edge slats



← Both the E190 Second Generation and CS100 will use the PW 1000G Pure Power engine

- 73 inch fan diameter
- 21,000 pounds take-off thrust
- Main noise source for flyover and lateral
 - Expected final take-off noise levels very similar for both, or even lower for E190 Second Gen. due to the lower MTOW





← Similar external dimensions

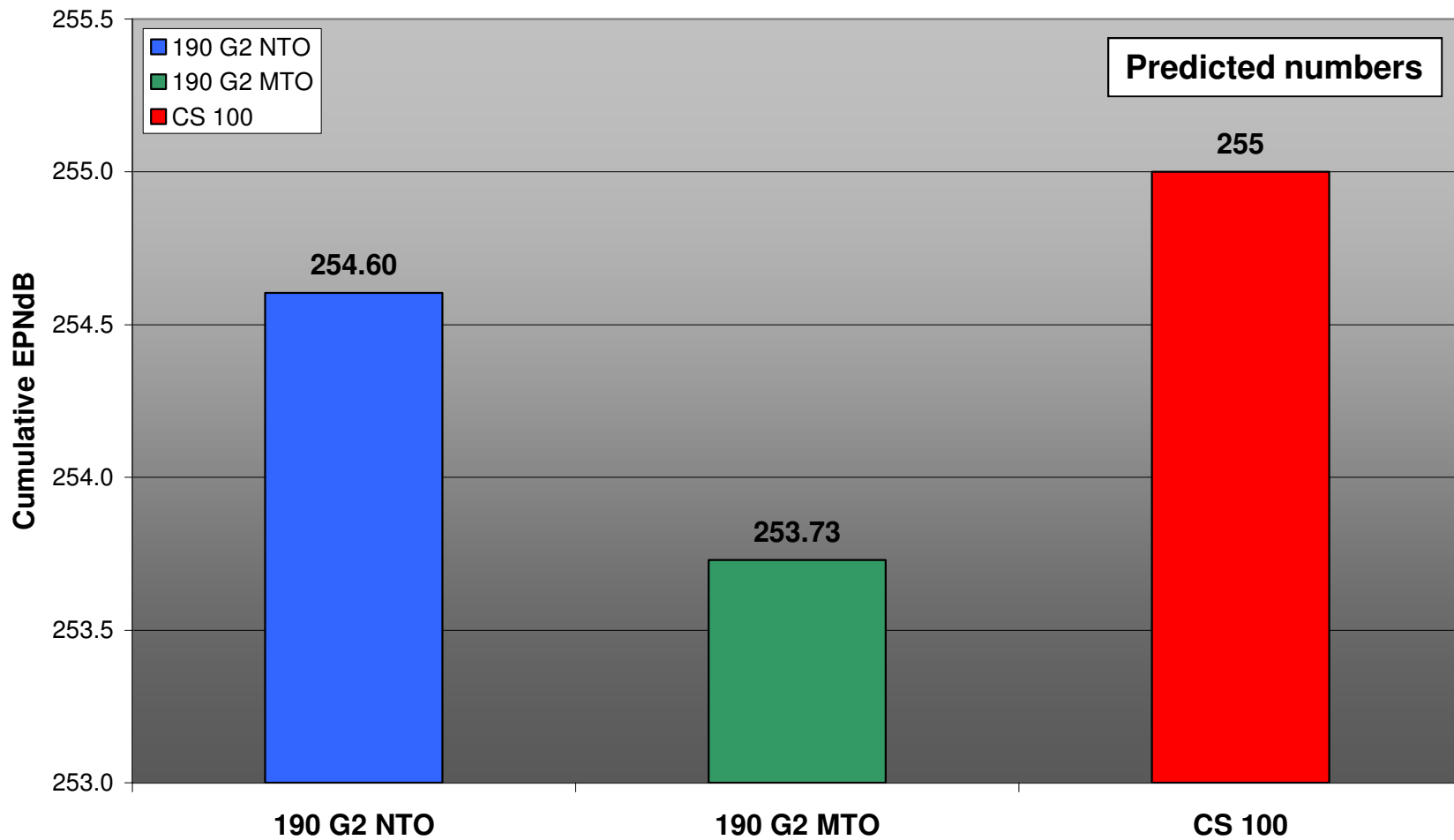
- Airframe noise sources very similar for CS100 and E190 Second Generation
- E190 Second Gen. has a slightly lower MLW
 - Expected final approach noise levels a little lower for the E190 Second Gen.



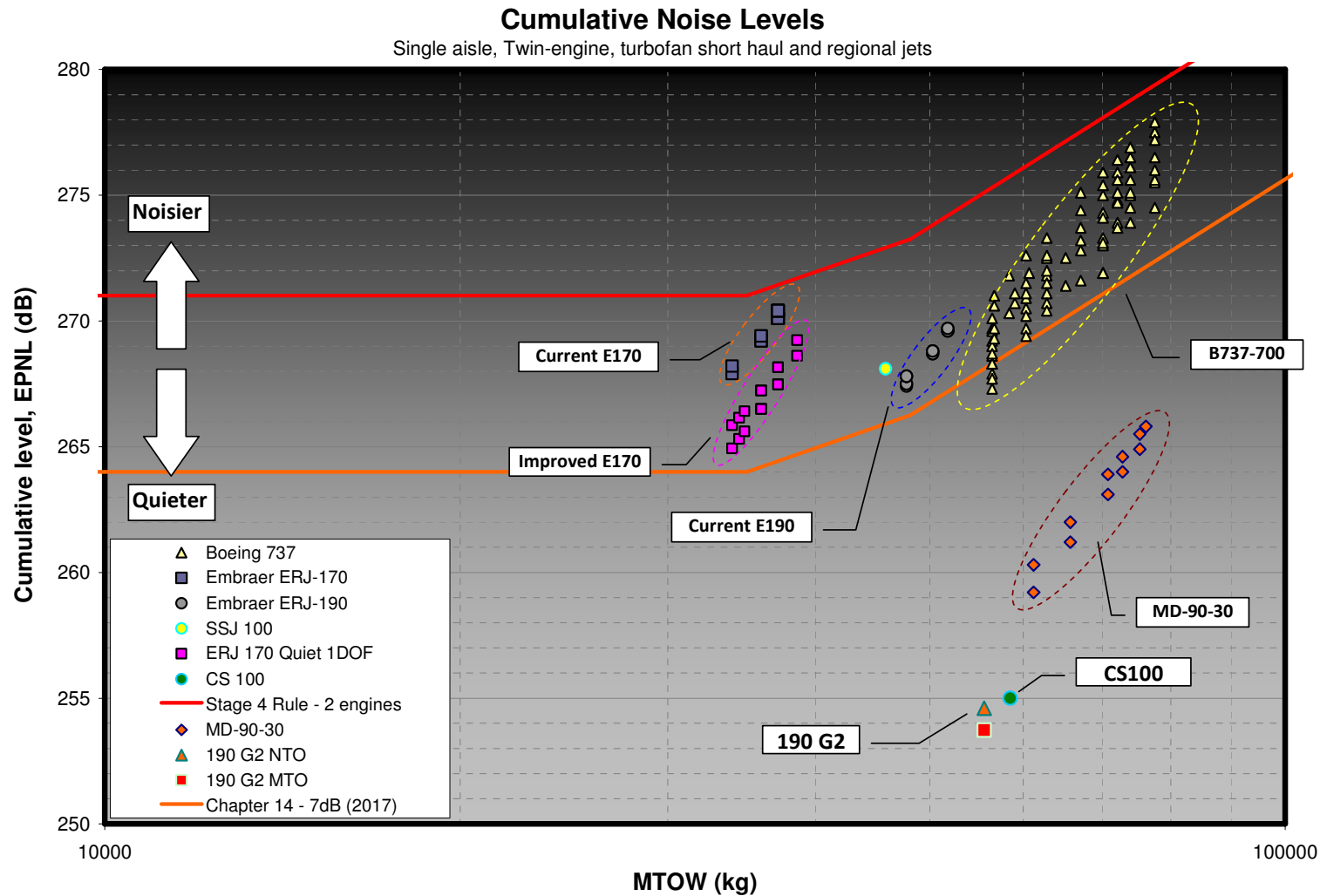
Cumulative Noise Levels



Effective Perceived Noise Levels (EPNdB)



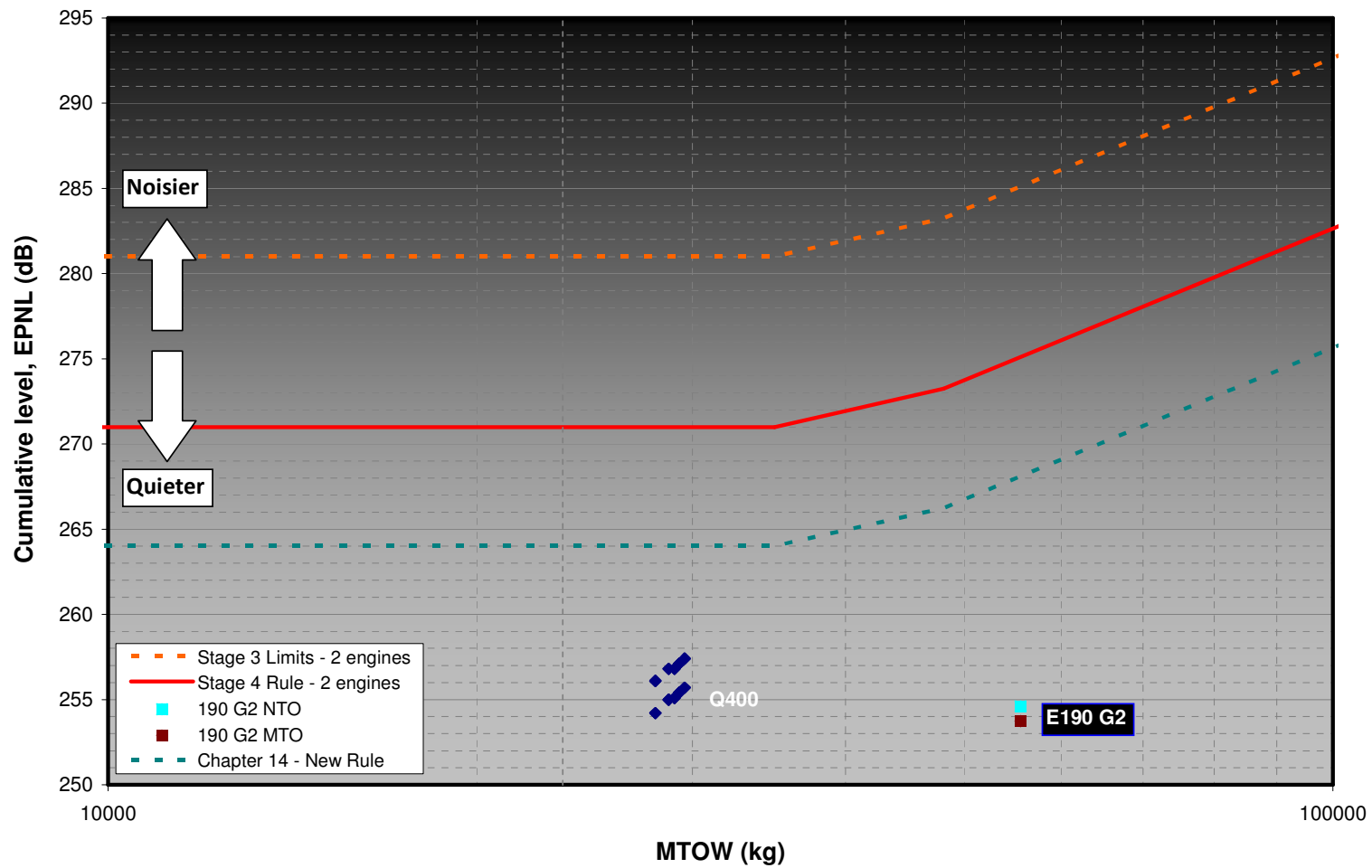
Cumulative Noise Levels



Cumulative Noise Levels



Cumulative Noise Levels



Airport Noise Restrictions



- ← **Airport noise restrictions are getting tighter**
- ← **However, none are related to aircraft type designations**
 - Certificated noise levels or airport noise monitors are typically used to limit impact over communities
- ← **Aircraft with similar certificated levels and design solutions tend to generate similar noise impact**
- ← **Very restrictive airport noise limits can be further addressed with the use of:**
 - Noise abatement operational procedures
 - MTOW reductions

London City Operation



London City Operation

- ← The current E-170/190 are certified to operate in London City Airport (LCY), one of the most restricted airports in terms of noise, since the steep approach (slope = 5.5°) capability is required
- ← YTZ and LCY present similar characteristics
 - Both airports located in central areas with noise restrictions
 - Both airports with very short runways
- ← However, the current E-Jets family has a successful history of operations from London City

E170 First Revenue Flight – Sep.29th,2009



E190 First Revenue Flight – Feb.10th, 2010





- ← **E190 Second Gen. and CS100 will tend to have similar certificated noise levels due to the same technology level regarding acoustic sources**
 - Engine
 - Wing, landing gear and high-lift devices
- ← **E190 Second Gen. has slightly lower design weights than the CS100, which is expected to result in slightly lower noise flyover and approach noise levels for the E190**
- ← **Predicted cumulative noise levels for E190 Second Gen. tend to be similar to lighter turboprop aircraft (ie:Q400)**