

## SECTION 1.11 ATPL PERFORMANCE AND LOADING (PL)

**Unit 1.11.1 APLC: ATPL performance and loading – all aircraft categories –  
Reserved**

**Unit 1.11.2 APLA: ATPL performance and loading – aeroplane**

### 1. Reserved

### 2. Take-off and landing performance

#### 2.1 Terminology

2.1.1 Explain the following terms in the context of take-off and landing performance:

- (a) speeds:
  - (i)  $V_1$ ,  $V_R$ ,  $V_2$ ;
  - (ii)  $V_S$  and derivatives (for example,  $1.3 V_S$ );
  - (iii) maximum rate and maximum angle climb speed;
  - (iv)  $V_{MCA}$ ,  $V_{MCG}$ ;
  - (v) flap retraction speed schedule;
- (b) distances:
  - (i) TORR/TORA, TODR/TODA, ASDR/ASDA, LDR/LDA;
  - (ii) balanced field length;
  - (iii) clearway, stopway;
- (c) weights:
  - (i) TOW/MTOW, LW/MLW, ZFW/MZFW;
  - (ii) basic operating weight;
  - (iii) useable fuel;
  - (iv) payload;
- (d) take-off segments:
  - (i) first, second, third and fourth segments;
- (e) pavement segments:
  - (i) LCN, CAN, PCN;
  - (ii) pavement concession;
  - (iii) wheel loading.

#### 2.2 Theory – take-off performance

2.2.1 Runway:

- (a) derivation/basis of take-off distance;
- (b) derivation/basis of accelerate-stop distance:
  - (i) delay factors assumed;
  - (ii) use of reverse thrust;
- (c) derivation/basis of  $V_1$ ;
- (d) concept of balanced field length;
- (e) clearways and stopways:
  - (i) function;
  - (ii) effect on  $V_1$ ;
  - (iii) effect on TOW when runway-limited;
- (f)  $V_R$  and  $V_2$ :
  - (i) interrelationship with  $V_1$ ;
  - (ii) range of acceptable values;