CHAPTER SIX

Access Equipment for Horizontal Loading Ships

Summary
This chapter examines the roll-on/roll-off concept and goes on to describe its implications for ship design in general and access equipment design in particular. Ro-Ro cargo handling equipment is described with special emphasis on container handling, and the principal characteristics of vehicles found in Ro-Ro vessels are listed. The chapter concludes by describing the variety of Ro-Ro access equipment available to the ship designer: ramps, bow and stern openings, elevators, side doors, bulkhead doors and car decks.

6.1 Design philosophy
Horizontal-loading vessels are commonly referred to as roll-on/roll-off or Ro-Ro ships and accept their cargo on wheeled vehicles via openings in the bow, side or stern. Not all horizontal-loading ships are strictly Ro-Ro ships however. For instance, pallet carriers may have side doors only, and accept cargo from fork lift trucks operating on the quayside (see Section 2.6.6).

Train ferries apart (see Section 8.3.4.2), the first purpose-built deep-sea Ro-Ro ship was the USNS Comet which was built in 1958, for the United States Military Sea Transportation Service, to carry military vehicles across the Atlantic with as quick a turnaround as possible.

Fig. 6.1 shows a hypothetical ship fitted with all the usual forms of Ro-Ro equipment, showing what is available and how it is used.

6.1.1 Traffic movements
Flexibility and fast port turnrounds are the essential features of Ro-Ro operations. High cargo handling speeds are therefore vital. Cargo handling rate can be increased in three ways:

(i) by increasing the unit load per vehicle until the vehicle’s size impairs its manoeuvrability and speed;
Fig. 6.1. The range of access equipment available for Ro-Ro ships is illustrated by this hypothetical vessel. 1. Bow visor (Section 6.4.1) 2. Bow ramp (Section 6.3.9.4) 3. Inner bow door (Section 6.3.9.4) 4. Car ramp (Section 6.3.10.2) 5. Car deck (Section 6.8) 6. Elevator (Section 6.5.2.) 7. Hatch cover 8. Bulkhead door (Section 6.7.2) 9. Multi-purpose ramp showing alternative positions (Section 6.3.10.4) 10. Fixed ramp (Section 6.3.10.1) 11. Stern ramp and door (Section 6.3.9)