“Only the systematic engineering, called EMC-planning, during the entire procedure of establishing a complex system ensures the EMC of a system during its utilization phase.”

This sentence introduces the chapter, ‘phases and phase papers of an EMC-planning’, in [GO/SI92]. The validity of this sentence is undisputable still today. Moreover, the necessity of an EMC-planning has increased. The procedure described in the cited chapter, relating strongly to the VG-methodology, guaranties that in any case a coherent, logical and continuous EMC-planning is carried out.

The essential parts of these statements are repeated, extended and updated in this chapter, whilst not making regular reference to the aforementioned literature.

The extent of EMC-system planning required depends on the complexity of the system to be constructed. The procedures described herein appeal primarily to the system planner. These are a maximum requirement that have to be reduced by an EMC working group (EMCAB = EMC advisory board) or the person responsible for the EMC.

By considering the manufacturing process of an electrical/electronic device, it has proven valuable to also recognise and execute an EMC equipment planning matched to the complexity of the device. The depth of planning depends on the complexity of the equipment under construction; more so for a device than for a system. Take for example a control station of a power plant; it becomes immediately clear that without a very detailed EMC-planning, with appropriate documentation, nothing meaningful is possible.

At the start of a device development the following should be fixed:

• What EMC-environment the device is to be developed for
• From this, which EMC-standards have to be considered and which EMC-limit values have to be fulfilled
• The construction of the housing (metal, metallised plastic, or no shielding)
• The kind of power supply
• The kind of peripheral equipment to be connected, and it what way
• Particular requirements with respect to the immunity
• The failure criteria if external disturbance signals are impinging
• The EMC-experiences from similar former projects
• The specifications of the internal cabling and wiring and the grounding philosophy to be followed
• How signal interfaces (input and output) have to be installed in a defined area of the device surface (single-point entree) and, moreover, specifying their position
• Which EMC-tests have to be carried out during the construction of the device

Subsequently, in the sense of this chapter, an EMC-planning at the device level (for the conceptual phase) has been executed. Adhering to the guidelines, and possibly updating them, reduces the EMC-test for confirming the manufacturer’s declaration of conformity to a formal act.

All considerations, measures and decisions regarding EMC are written down during the entire development process of a project. This produces a clarity that allows for simple retrofitting in the case of incompatibilities and limit overshoots. Furthermore, the assignment of guilt at a later date is avoided to some extent.

The tasks within the EMC-planning and EMC-management of a complex system consist of:

1. Collection of data relevant for the EMC, including
   • Proposed purpose and location
   • Constructional facts
   • Devices to be installed

2. Subdivision of the system into EMC-zones utilizing natural borders (mechanical shielding walls)

3. Specification of limit values for the devices of the particular EMC-zones (regarding emission and susceptibility)

4. Fixing of the guidelines for the intra system measures, such as:
   • Grounding
   • Shielding