

Case study on EM management

Controlling the cost of RF hazards in the offshore oil industry

The process of designing and building for the offshore oil industry is very expensive. AMEC Process and Energy, a major contractor to the oil, gas and petrochemical industries, maintain their efficiency by making sure that their designs are totally safe and reliable before committing too many resources to a project.

ERA Technology, with its long experience of solving electromagnetic compatibility problems, has been working closely with AMEC Process and Energy to ensure that their on and off-shore projects meet the design criteria for safe and reliable operation. ERA has also provided guidance on the retrofitting of critical sections of existing facilities such as control and communications suites.

As the electromagnetic spectrum becomes more cluttered with radio frequency (RF) activity, the risk of interference to electrotechnical systems continues to multiply.

Characterisation of the immediate EM environment is therefore of vital importance to the awareness and management of RF hazards. Unlike the telecommunications, railway and automotive industries, the petrochemical industry has no dedicated EMC standards and must therefore rely on those which are no more than generic.

Although the EU's EMC Directive confirms that it is the 'manufacturer' of an installation who is responsible for ensuring that the provisions of the directive are met, the available generic standards do not address basic safety requirements for reliable plant operation.

Consequently, special mitigation measures must be employed when the level of RF activity in the environment exceeds that specified within the generic standard, which is being followed.

In the case where the operation of a particular plant is both highly expensive and carried out in a hazardous area, malfunctions caused by the effects of electromagnetic radiation can entail not only loss of production and money, but serious risk to personnel.

ERA's main task was to deliver to AMEC Process and Energy an overall EMC management plan that would provide authoritative guidance on the interpretation and application of the EMC Directive. The responsibilities of the various parties in the supply chain and the technical and contractual procedures to be followed in the systems integration process were also detailed, thus giving the operator confidence in the integrity and reliability of the installation.

An EMC management plan involves an approach to compatibility that spans the entire life cycle of a product or installation, from initial design to maintenance and upgrades. This 'from concept to completion' philosophy is almost certain to become, in time, an integral part of the business process.

ERA also carried out an independent EMC hazard analysis of selected installations, firstly by zoning or breaking down the RF environment (using basic standards such as IEC documents as a guide), and secondly by drawing up guidance documents for addressing the equipment used in each zone and detailing any special precautionary measures necessary to meet the objective of safe and reliable operation.

The result was the introduction of an EMC management plan, which provides a clear, sound and structured method of controlling or reducing the risks from RF emissions. The plan ensures that an installation will meet both the legal requirements of the EMC Directive and the perhaps more crucial requirements of plant operators.