

ISA WG position statement on Independent Environment Assurance (IEA) and its relation to Independent Safety Assurance (ISA) activities

Purpose

This position statement gives the opinion of the Independent Safety Assurance (ISA) Working Group (WG) on Independent Environmental Assurance (IEA) in so far as it should be considered within ISA activities, and therefore within the business of the ISA WG.

This position statement's primary focus is on environment protection and safety when this depends (at least in part) on electrical, electronic or programmable electronic systems. It should be noted that the general principles considered within this statement will also apply to the assessment of systems that use other technologies and management processes.

Background

The assessment of many complex systems today requires the parallel assessment of both safety, and environmental protection. This will generally be conducted by separate specialists within a common system design team. However, independent assessment activities may be carried out by a single Independent Safety and Environmental Assurance (ISEA) body. As such it is important for professionals operating within the safety or environmental domains to have an understanding and appreciation of the other to allow this joint approach to succeed.

Independent safety assessment may involve coming to a judgement about the safety of a system, or the processes that have been used to demonstrate the safety of that system. Independent environmental assessment may involve coming to a judgement about the level of environmental protection that a system offers, or the processes that have been used to demonstrate the level of environmental protection that a system offers. Whilst both will consider the effects of risks generated by a system, the environmental assessment will also consider impacts (e.g. defined environmental effects arising through normal operation, both harmful and beneficial), presenting the fundamental difference in approach applied to environmental assessment.

There is no clear boundary between the two disciplines, as a single hazard generating a safety risk, may present a different environmental risk and impact. Therefore, the two disciplines have to be considered in their own right. From the perspective of the safety assessor the safety of a system can depend in part on matters relating to environmental protection. In particular:

- Design or operational choices made in order to address risks or impacts to the environment may have different effects within respect to safety management (both positive and negative);
- Hazards that may present impacts or risks to the environment may also present a risk to safety (e.g. if noxious materials are released), measures to protect against such threats need to be suitable from both environmental and safety viewpoints;
- An environmental impact that meets legal requirements, may present a risk to safety in particular circumstances (e.g. engine exhaust from a vehicle).

Environmental protection aspects of a system are therefore of both interest and importance for ISAs.

There is increasing public awareness of, and concern about, environment risks. Such risks range from risks to natural environments, non-human life (animals, plants etc.), risks affecting quality of human life, and risks to individual human health (and possible consequential death). Within organisations that design products and processes, and within the wider community, there is increasing awareness that environmental risks need to be addressed at all stages in the lifecycle of a system, from concept to ultimate decommissioning and disposal. While public attention tends to be focused on environmental risks and impacts in isolation, there is a growing perception among safety specialists that environmental and safety risks need to be addressed in a co-ordinated manner if they are both to be addressed satisfactorily. Design for Environment (DFE)

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considerations are often beneficial for eliminating or reducing safety risks and, therefore, of benefit to both safety and environmental considerations.

Basis of Opinion

In support of this position statement safety and environmental protection will be considered from the following three perspectives:

- The relationship between safety risk and environmental risk;
- Implications of environmental protection for technical aspects of safety assessment;
- Implications of environmental protection for professional aspects of ISA.

The relationship between safety risk and environmental risk

The concept of risk within both disciplines is the same; it is defined as the product of frequency and severity. The method by which that risk is reduced, through the application of mitigating measures is also the same. The general concepts of risk management within each discipline are based on similar principles.

Based on the ISA WG “Competency Framework for ISAs” environmental protection may be looked at as a “Technical Skill”. Therefore, the guidance applied to competencies within this particular technical skill applies. This will include (based on Table 1 of the Competency Framework for ISAs document):

- Knowledge and experience of the techniques and methods used to determine and analyse environmental protection issues of importance and to make a judgement on the environmental protection properties of a system;
- Understanding the principles and concepts of environmental protection and environmental protection management appropriate to the domain;
- Knowledge and experience of the specific activities performed as part of an environmental protection assessment and audit (e.g. document review, process audits and independent analyses).

Whilst the ISA WG recognises that the basic principles of risk and risk management are common to both safety and environmental management activities, the WG considers that specialist environmental knowledge is required by the ISA, or within the ISA Team, in order to conduct an effective assessment activity in line with the ISA WG “Competency Framework for ISAs” document.

Implications of environmental protection for technical aspects of safety assessment

Any environmental aspect that has the potential to cause harm to personnel within the scope of a safety assessment should be identified as a hazard within the system safety assessment and managed in the same manner as any other hazard.

The ISA WG again recognises the principles of the safety assessment process undertaken, but considers that specialist environmental knowledge is required by the ISA, or within the ISA Team, in order to conduct an effective assessment activity in line with the ISA WG “Competency Framework for ISAs” document.

Implications of environmental protection for professional aspects of ISA

To date the ISA WG has provided advice and guidance on a number of aspects of independent safety assurance to the ISA community and to organisations using ISA services. Within the environmental field, this role is paralleled by IEMA, the professional body for those working in the areas of the environmental protection and sustainability. IEMA operate as a professional body, and operate a more formal process of training and registration for auditors. The training is based on relevant qualifications, a series of recognised formal courses with the award of auditor grading based on verified experience of completing auditing shadowed by a qualified lead auditor across specific domains. The approach to training allows the IEMA auditors to operate in a variety of areas including the built environment, legislation compliance, and process and product environmental assessment, as the scope of audit requires.

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On this basis the ISA WG considers that there is an established and effective professional body in place which can provide structure and provide advice to the role of an independent environmental assessor.

Opinion on Independent Environmental Assurance, with respect to the activities of the ISA WG

The ISA WG notes that:

- Harm to humans may arise from aspects of system design, build, operation and disposal. This harm may take on different forms and be controlled in different ways dependent on whether the associated hazard is considered from a safety or environmental perspective;
- Safety and environmental protection is addressed by predominantly different and distinct legislation; compliance with both is necessary;
- From a human perspective, there is no boundary between harm to humans due to the environmental and safety impacts of a system;
- Environmental protection has wider scope and implications than just harm to humans, thus it is appropriate for there to be co-ordinated environmental and safety programmes during development, operation and modification of a system.

The ISA Working Group:

- Recognises the importance of addressing environmental risks and impacts, and legal / regulatory requirements, as well as ensuring the safety of a system;
- Recognises that safety and environmental requirements may need to be balanced and that candidate control measures / mitigations may have interactions in both discipline areas;
- Believes that harm to humans from both safety risks and environmental impact and risks needs to be addressed in a coordinated way during identification of requirements, design, manufacture, operation, end use and disposal of a system;
- Encourages the development and use of processes, methods and standards that co-ordinate both environmental protection and safety during the system development lifecycle;
- Recommends that if a system could have an environmental impact that may result in harm to humans, the safety and environmental programmes (including independent assessment) are co-ordinated so as to ensure the timely and effective generation and exchange of information relevant to both environmental protection and safety;
- Recognises IEMA as the body which provides advice, guidance, and registration of environmental auditors.

The ISA Working Group recommends that ISAs:

- Develop an appreciation of how safety and environmental considerations for systems (e.g. design technologies, architecture, risk control measures, operation) may interact and are best considered in a co-ordinated way;
- Ensure that they know and understand the potential for harm to humans from the environmental risks and impacts of systems within the system and technical domains in which they provide ISA services;
- Develop and maintain awareness to understand what may cause systems to have an environmental risk or impact with potential to cause harm to humans, the possible effects on human life from those risks and impacts, and how they may be reduced or eliminated within the system;
- Use independent environmental assessment expertise to supplement personal or team competence where appropriate or where required by the customer. Such resourcing aspects should be included in any ISA planning activity;
- Include relevant environment-related activities in safety process audits and assessments, coordinating with any independent environmental assessments to avoid duplication.