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# The IEC61508 Directors' hymn sheet

*A few key points for those Directors  
responsible for overseeing projects that  
involve the IEC61508 group of standards*

by The 61508 Association

**SAFETY INSTRUMENTED SYSTEMS  
are too important to leave to chance!**

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# High integrity safety systems and the IEC61508 group of standards

IEC61508 is considered good engineering practice, so if your Company is involved with functional safety you are responsible for ensuring that your Company complies with all the relevant parts of IEC61508.

NOTE: If Occupational Safety is “slips, trips and falls etc” then Functional Safety is protective systems for process plant and machines etc. So Functional Safety covers things like safety trips and alarms.



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# Important and surprising fact number 1

The IEC61508 group of standards require that the End-User decides the level of tolerable risk. There is no set value in the standard....

... so the Board of Directors of the end user company decides what the risk of fatality to an employee will be. This is **NOT** decided by engineering but by the Board of the Company.

... If you have issued a COMAH report then the fatal accident rate is ALREADY written in the COMAH report and you should use that same value for your SIL assessments under the IEC61508 group of standards.

... Many industry bodies give recommended values. The Chemical Industries Association recommend members achieve better than  $1 \times 10^{-4}$  per year and suggest that anything below  $1 \times 10^{-3}$  per year would not be acceptable.

NOTE:  $1 \times 10^{-4}$  per year would be “1 death per 10,000 years” as a probability



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# Important and surprising fact number 1 *continued ...*

Your engineers will compare each risk to your corporate tolerable target value and assign a Safety Integrity Level (“SIL”) for each risk that is too great.

If the SIL assessment says you need a SIL 1 safety loop then that means that without that one safety loop the actual risk of fatality\* is more than 10 times the wrong side of your tolerable target.

A SIL 2 loop means that without that one loop the actual risk of a fatal accident is more than 100 times the wrong side of your tolerable target

A SIL 3 ... actual risk is more than 1000 times the wrong side of tolerable without that safety loop being fully functional

A SIL 4 ... *it exists under the standard but does your company really want to admit that without that one safety loop you have a risk that large?*

\*That is if the SIL loop has been provided for protection of people.  
The SIL loop may have been provided for environmental or asset protection.



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# Important and surprising fact number 2

The IEC61508 group of standards require that ALL companies involved with functional safety have and are able to demonstrate “Functional Safety Management”

..... it is not usually a problem provided a good Quality Management System (QMS) is already in place. Functional Safety Management includes good QMS that you may already have.



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# Important and surprising fact number 3

The IEC61508 group of standards require that you have in place “Functional Safety Management”

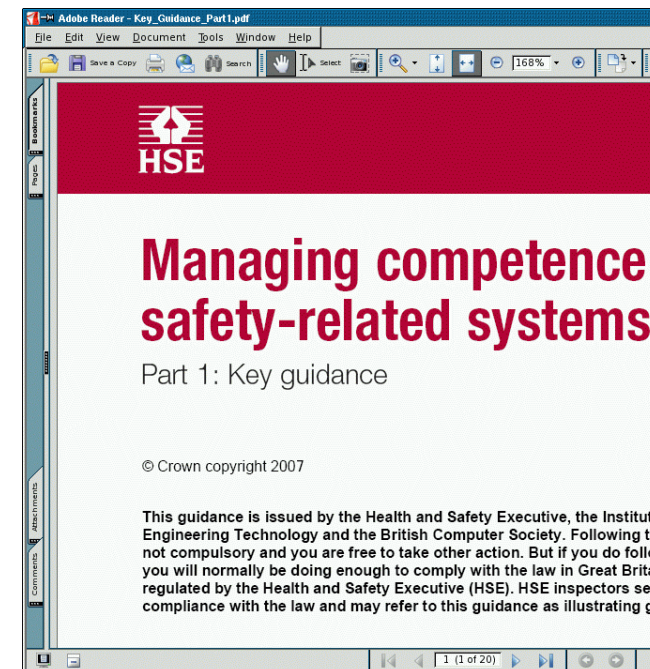
If you have a SIL rated loop then Safety is depending on that one SIL rated loop so EVERYONE involved has to be competent – *from those specifying what is needed right through to the maintenance team on the factory floor.*

... IEC61508 Part 1 Clause 6

... matching requirements appear in the sector specific guidance standards (For example: IEC61511 Part 1 Clause 5)

... Regulators are requiring that safety management is properly covered (See the HSE guidance - “Managing Competence for Safety Related Systems” July 2007)  
<http://www.hse.gov.uk/consult/condocs/competence.htm>

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# Important and surprising fact number 4

The presence of a certified expert is **NOT** proof of  
“Functional Safety Management”

... The Functional Safety Management will review the competencies of everyone involved and it identifies those who require particular expertise. Thus the use of a functional safety expert may sometimes be appropriate as a decision that comes out of a contractor's or supplier's Functional Safety Management, but **it is NOT a substitute for** Functional Safety Management

... Functional Safety Management covers EVERYBODY involved

... not just the expert

... not just the technician

... it involves everybody involved with the safety system (including you, the Company Director !)



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# High integrity safety systems

## The objectives

The Board of Directors dictate policy.

The policy should aim for:

- 1) Tolerable risk targets set are appropriate and match agreements in other areas (e.g. COMAH reports).
- 2) Safety systems targetted to minimise loss and maximise plant availability
- 3) Functional Safety Management in place so that safety is optimized and the number of high integrity safety systems is kept to a MINIMUM.
- 4) Suppliers and contractors and their suppliers and contractors should be able to demonstrate Functional Safety Management such that:
  - a) the supply chain operates smoothly
  - b) examination by regulatory authorities takes the least time and effort





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# Your guide for Management

- IEC61508 is considered good engineering practice, so if your Company is involved with functional safety you are responsible for ensuring that your Company complies with all the relevant parts of IEC61508.
- Assess and manage the competencies of everyone involved in the safety loop's lifecycle.
- People's safety depends on safety loops working so take your own Functional Safety Management seriously, and ensure that you insist on your associate Companies having such a system and taking it seriously.
- Don't accept the presence of an “expert” from your suppliers as proof of Functional Safety Management *(there are no certified experts mentioned anywhere in the standard)*
- *You can't subcontract or delegate Functional Safety management responsibility!*