IEC 61508 Safety Lifecycle

ABB provides a total lifecycle safety capability aligned to the IEC 61508 Safety Lifecycle. We are the best-placed leading international company to be able to advise you on all phases from Concept (1) to Decommissioning (16), including the Hazard and Risk Analysis which is necessary to determine the overall safety requirements of any plant or process. In addition, ABB offers a comprehensive selection of instrumentation and other equipment required to implement fully safety compliant plant, whether as stand alone products or in fully integrated packages. These are supported by our installation, commissioning, operation, maintenance and other services.

Pre-Design Phases 1 – 5 (End User / Operator) Setting the SIL Target

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Overview of Lifecycle Phases

1. Concept
2. Overall Scope Definition
3. Hazard Risk Analysis
4. Overall Safety Requirements
5. Safety Requirements Allocation
6. Overall Operation & Maintenance Planning
7. Overall Installation & Commissioning Planning
8. Overall Validation Planning
10. Safety Related Systems: Other Technology Realisation
11. External Risk Reduction Facilities Realisation
12. Overall Installation & Commissioning
13. Overall Safety Validation
14. Overall Operation & Maintenance
15. Overall Modification & Retrofit
16. Decommissioning

Pre-Design Phases 1 - 5 End User / Operator
Set the SIL target

Design and Installation Phases 6 - 13 (Engineering / Equipment Supplier)
Design the architecture / Provide the integrity information

Operation Phases 14 - 16 (End User / Operator)
Operate & Test to Verify Target SIL
= Design SIL = Operation, Manage maintenance and modifications

Safety Integrity Levels

<table>
<thead>
<tr>
<th>Safety Integrity Level</th>
<th>Average Probability of Failure on Demand (PFDavg)</th>
<th>% Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.1 to 0.01</td>
<td>90% to 99%</td>
</tr>
<tr>
<td>2</td>
<td>0.01 to 0.001</td>
<td>99% to 99.9%</td>
</tr>
<tr>
<td>3</td>
<td>0.001 to 0.0001</td>
<td>99.9% to 99.99%</td>
</tr>
<tr>
<td>4</td>
<td>0.0001 to 0.0001</td>
<td>99.99% to 99.999%</td>
</tr>
</tbody>
</table>

Risk Determination Methodologies

- Hazard studies and HAZOPs
- Evaluate possible consequences
- Establish tolerable frequencies vs ALARP
- Build event chain
- Estimate demand rates
- Define protection required
- Specify required Safety Integrity Level

Hazard & Risk Analysis

Identifying Potential Hazardous Events
Assess Risk
Risk Reduction Achieved by All Protection Layers
Introducing Risk Reduction and Risk Targets

Residual risk
Risk reduction from other protection layers
Risk reduction from other non-SIS protection layers
Risk reduction from other non-SIS protection layers
Risk reduction from SIS layer
Necessary risk reduction
Actual risk reduction

For Safety Lifecycle and Hazard Analysis advice, please call 01642 372000.
For details of relevant ABB Instrumentation, Systems and Equipment, please call 0870 600 6122.

www.abb.co.uk/instrumentation

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Demand more from your instrumentation. Demand more from your source.