

Title	Report 304: Fire system integrity assurance
Publisher/Author	OGP
Publication Date	2000
Abstract	<p><b>Background</b></p> <p>Experience has shown that fire detection and protection systems are not always designed or specified in sufficient detail to ensure that they meet the performance criteria necessary to reliably achieve their intended role. In some areas this role is not even clearly defined. The problem is compounded because often the system designer/specifier has not the operational experience or feedback necessary to ensure system practicability. Also, as fire systems do not provide a direct contribution to production and revenue, they are sometimes not given the inspection or maintenance priorities that they deserve. In any event it is impracticable to give them a full performance test on site that truly reproduces the design fire event.</p> <p>This situation can result in fire systems not providing the performance required, when called upon to do so. A structured approach from design phase through to implementation is required for fire systems to ensure that they have a clearly defined role with respect to fire hazards, and that they provide appropriate levels of risk reduction.</p> <p><b>Scope and Objectives</b></p> <p>This guidance document addresses the issues involved in the assurance of fire system integrity, from development of appropriate performance criteria, through to routine system testing and inspection to assess ongoing performance against the original criteria. For the purposes of this document the term Fire System means a fire detection system, passive fire protection or an active fire protection system such as waterspray, foam or gaseous extinguishing system.</p> <p>The objective of the document is to describe a structured approach to Fire System Integrity Assurance and give guidance on its application. In keeping with a hazard based approach to the provision of fire systems, the guidance is not intended to be prescriptive, but to act as a template to develop facility specific assurance programmes appropriate to the levels of risk reduction provided by the systems.</p> <p>It is emphasised that this document is intended to give guidance on the assurance process itself once it has been decided from a risk assessment that a fire system is justified. It is not intended to give any detailed guidance on the overall risk management process, other risk reduction systems (such as Emergency Shutdown) or the suitability of different types of fire system for different applications. The Fire System Integrity Assurance (FSIA) process is described in more detail in Section 2.</p>
Table of Contents	<p>1 Introduction</p> <p>    1.1 Background ..... 1</p> <p>    1.2 Scope and objectives ..... 1</p> <p>    1.3 Health, safety and environmental management ..... 1</p> <p>    1.4 Hazard management and the role of fire systems ..... 1</p> <p>    1.5 Performance standards ..... 2</p> <p>2 Fire system integrity assurance (FSIA) process</p> <p>    2.1 FSIA process steps ..... 3</p> <p>3 Assessing potential fire events</p> <p>    3.1 Introduction ..... 5</p> <p>    3.2 Fire hazard identification ..... 5</p> <p>    3.3 Fuel inventory and pressure ..... 5</p>

3.4	Size, severity and duration .....	6
3.5	Escalation .....	6
3.6	The "Design Event" .....	6
4	Setting fire system performance standards	
4.1	Performance standard definition .....	7
4.2	Overall role ("goal") .....	7
4.3	Performance specifications .....	7
4.4	Component specifications .....	8
4.5	Codes of practice/manufacturer's data/operational input .....	9
4.6	Performance specification summary .....	9
5	Typical critical performance criteria for fire systems	
5.1	Detection systems .....	10
5.2	Water systems .....	11
5.3	Foam systems .....	12
5.4	Gaseous systems .....	13
5.5	Passive protection .....	15
5.6	Personnel response .....	15
6	Examination and testing of fire systems	
6.1	Introduction .....	17
6.2	Direct system testing .....	17
6.3	Indirect system testing .....	17
6.4	Interpretation of results .....	18
6.5	Impact on maintenance regime .....	18
6.6	Exercises .....	18
7	Record keeping	
7.1	Performance trends .....	19
8	Appendices	
	Appendix 1 - Guidance on system inspection/testing procedures, schedules and record keeping .....	20
	Appendix 2 - Cost benefit analysis equations .....	24
	Appendix 3 - Reference documents and contact addresses .....	25
	Appendix 4 - Abbreviations .....	27