









Functional Safety, Standards - Overview

	Standards	Descriptions	Status – 2011	USA	EU	Comments
	International Organization for Standardization	ISO 13849-1 , FS, Appl. specific std (PL), H-P ISO 13849-2 , FS, Validation ISO 12100 , FS, Risk Assessments	Supersedes EN954 ISO 14121 , EN1050	X - -	X X X	Customers – more guidance with safety calculations. Safety Evaluation Tool
	International ElectroTechnical Commission	IEC 62061 , FS, Application specific std. (SIL) IEC 61508 – Generic Safety Standard IEC 61511 – Process Safety Standard		X X	X X	Customers – more guidance with safety calculations. Safety Evaluation Tool
	Occupational Safety and Health Administration	OSHA 29 CFR 1910, Subpart O , Machinery and Machine Guarding Safety OSHA 29 CFR 1910.147 Control of Hazardous Energy (Lockout / Tagout)		X X	- -	Siemens Safety Solutions Tested and certified by NRTL's
	American National Standards Institute	ANSI B11 Series – 2007–2010		X	-	To be followed for application specific standards
	National Fire Protection association	NFPA 79 – 2012 , Machine Safety NFPA 85 – 2011 , Burner Mgmt. Systems NFPA 86 – 2011 , Burner Mgmt. Systems	NFPA 79: Electrical Standard for Industrial Machinery, 2012 Edition	X X X	- - -	Compliance required, Wireless and Drives safety allowed
	Underwriters Laboratories	UL NRGF covers ANSI / UL 508 / 1998 / NFPA79 and IEC 61508 Also UL Functional Safety mark		X	-	UL FS Mark recognition (same as OSHA [NRTL], TUV certified)
	Robotics Industries Association	ANSI / RIA R15.06-1999 , ANSI / RIA / ISO 10218-1-2007	Draft Standard R15.06-201X	X X	- X	Required for all robotic machine safety applications
	Canadian Standards Association	CSA Z434 (R2008) : Safety requirements for robots and robot systems	Draft Standard R15.06-201X	-	-	Only required if OEMs shipping machines to Canada