MTTFD Values for Hydraulic Valves

1 General Information

The MTTFD value (mean time to dangerous failure) of a component is used to calculate the probability of a potentially dangerous failure of a machine or system. For hydraulic components (e.g., valves), a MTTFD value of 150 years can be presumed according to ISO 13849-1:2016 if the fundamental and proven safety principles according to ISO 13849-2:2012 are adhered to as shown in table C.1 & C.2. The value is based on the assumption that the annual number of switching cycles is greater than 1 million.

Requirements for hydraulic valves employed in safety-related parts of control systems include:

- reliable maintenance of the basic settings, i.e., protection against unexpected power-up, e.g., when the power supply is switched on
- automatic reset to basic settings in case of a power failure
- sufficient overlap of spool valves in the basic setting

Hydraulic valves, which do not completely fulfill the safety principles, are not suitable for application in safety-related parts of control systems.

2 MTTFD Values of Bucher Hydraulics AG Frutigen

Bucher Hydraulics AG Frutigen marks the MTTFD values in the corresponding data sheets of the valves. This confirms compliance with the fundamental and proven safety principles of ISO 13849-2:2012, according to table C.1 & C.2. These values can only be used for calculation if the operating conditions and installation instructions mentioned in the data sheet are complied. This includes, among other things:

- hydraulic fluids used and their cleanliness over the entire service life
- temperature range of the pressure fluid and the environment
- regularly switch or actuate the system at reasonable intervals because spool seizures may occur after a prolonged period in which the switching spool valves are not used

The customer bears the responsibility for the implementation and operations of the valves according to EN ISO 13849-1:2016. The latter is responsible for machine safety, including the correct design and evaluation of hydraulic valves used in safety-related parts of control systems. As a result, the customer is responsible for ensuring compliance with normative and statutory requirements in the countries concerned.

3 Exceptions

The MTTFD value can be estimated higher if the average number of annual operations (nop) is less than 1 million switching cycles - (ISO 13849-1:2016 table C.1).