

UNDERSTANDING SIL VERIFICATION

STEP 1: DEFINE SAFETY REQUIREMENTS



Process Plant

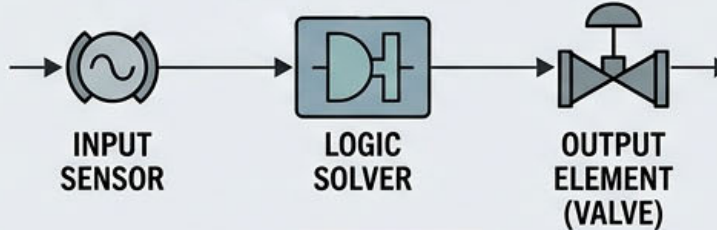


Hazard Analysis

SIL TARGET
(e.g., SIL 2)
Based on risk

STEP 2: DESIGN & VERIFICATION

SAFETY INSTRUMENTED FUNCTION (SIF)



INPUT
SENSOR

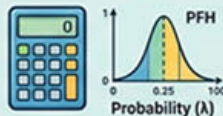
LOGIC
SOLVER

OUTPUT
ELEMENT
(VALVE)

SIL TARGET

PARAMETERS TO VERIFY

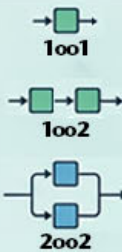
1 PFDavg & PFH CALCULATION



λ	PFH	Delta	Delta	λ	
Delta	λ ₁	0.11	Delta	0.15	0.335
Delta	λ ₂	0.23	Delta	0.29	0.685
Delta	λ ₃	0.35	Test	0.25	0.001
Delta	λ ₄	0.55	Test	0.15	0.005
Delta	λ ₅	0.13			

Failure Rates (λ) Test Intervals

2 HARDWARE FAULT TOLERANCE (HFT)



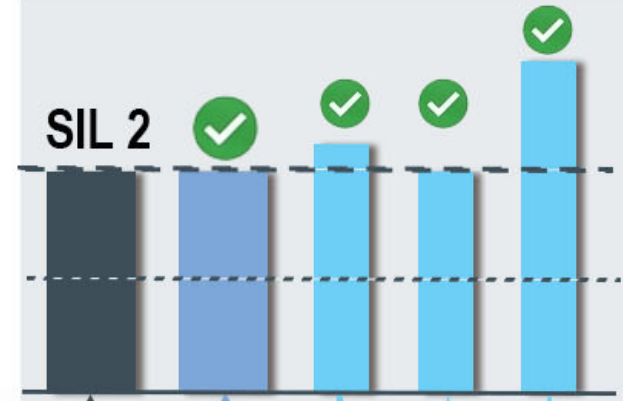
Minimum HFT for Architecture

3 SYSTEMATIC CAPABILITY



STEP 3: COMPARE & VALIDATE

SIL 2



SIL ACHIEVED

Min Selector

SIL VERIFICATION Complete

SIL ACHIEVED



SIL TARGET

