ENGINEERING SAFETY CONSULTANTS
The Global Provider of Functional Safety Expertise and Technical Consultancy

Random Hardware Reliability Certificate

Functional Safety of Safety-Related Programmable Electronic Systems

The **Hochiki Europe (UK) Ltd, CHQ-DSC2(SCI) and CHQ-DSC2/DIN(SCI)** (function is to communicate to the ESP Control Panel and receive commands to switch on sounders, and also monitors for an open circuit which is fed back to indicate a detected line fault) has been assessed and is considered capable for use in a low demand Safety Function up to (and including) SIL 2, with respect to random hardware failures and architectural constraints.

The following product variants are also covered under this certificate, with the product labels being the only difference:

- CHQ-DSC2(SCI)/SIL;
- CHQ-DSC2/DIN(SCI)/SIL;
- CHQ-DSC2/DIN(SCI)-RWY.

The assessment was based on the assumptions, data provided, and recommendations given in:

- **Engineering Safety Consultants Ltd Report: E029_SV003 rev. 6;**
- **Renewal letter from Hochiki Europe (UK) Ltd, signed by Shane Bartlett, Compliance Manager Engineer, dated: 03/10/2022.**

The product was assessed against the following failure mode:

- **Failure to drive sounder output when demanded.**

The assessment was carried out to determine compliance with IEC 61508 with regards to:

- CHQ-DSC2(SCI): SIL 2 with a HFT = via Route $1_{H;}$
- Architectural Constraint (Type A, SFF 60% - 90%).

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Device	λ (/hr)	λ_{DU} (/hr)	λ_{DD} (/hr)	λ_S (/hr)	SFF (%)	Device Type	Estimated SIL Capability
CHQ-DSC2(SCI)	2.1E-07	4.0E-08	1.6E-07	4.0E-09	81	A	SIL 2

Note: The PFD or PFH of a complete SIF (inclusive of sensor, logic solver and final element subsystems) must be determined, considering any redundancy, Proof Test Interval (PTI), Proof Test Coverage (PTC), Mission Time and Mean Time To Restoration (MTTR) for all elements. Each subsystem should be verified to ensure compliance with the minimum HFT requirements.

IMPORTANT: It should be noted that this assessment does not include confirmation of the response time of the device. For response times (along with any relevant assumptions) reference should be made to the Safety Manual of each device and the total SIF response time **MUST** be compared against the process safety time for the specific application.

Managing Director: Simon Burwood
Assessment Date: May 2015
Renewal Date: October 2022, valid to October 2024
Certificate: E029_CT003 rev. 8

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