

K-Safe

Kongsberg Safety Systems



KONGSBERG

Kongsberg Safety Systems (K-Safe) is a family of computerized systems that form part of risk reducing facilities on the installation. The K-Safe systems are developed and designed specifically for safe monitoring and automatic corrective actions on unacceptable hazardous situations.

About safety systems

Computerized safety systems gather all safety-relevant information into a common system for manual or automatic processing.

All safety functions should be installed in addition to and functionally segregated from the control system installed onboard.

Sharing information between the control system and the safety system will increase the overall safety onboard by giving the operator a better overview of the overall situation. The shared information can be shown on the K-Safe operator station (OS) and/or any K-Chief 700 or K-Pro OS.

K-Safe products always incorporate in the integrated network topology based on strict safety assessments.

K-Safe features

- Monitors and controls installations according to cause and effect charts.
- Allows the operator to safely monitor the situation and intervene with manual actions before the pre-programmed actions will take place.
- Supports multiple redundante configurations.
- Offers Safety Integrity Level (SIL) for an instrumented safety function as defined in the standard IEC 61508.

- SIL 1
- SIL 2
- SIL 3



Product range

K-Safe 1

- Single computer with diagnostics
- Redundant net and power
- Complying with SIL 1
- Typically for Fire & Gas, and PSD application

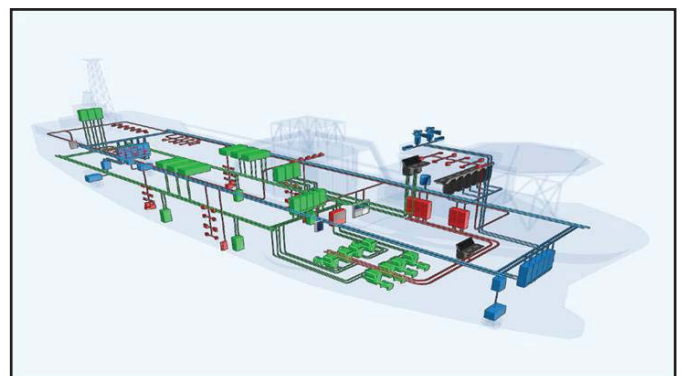
K-Safe 2

- Redundant 1oo2d system architecture
- Redundant computers, net and power.
- Full or medium diagnostics on all safety critical function

- Complying with SIL 2
- Typically for Fire and Gas, and PSD application

K-Safe 3

- 1oo2d redundant system architecture
- Redundant computers, IO, net and power
- Full diagnostic on all safety critical functions
- Complying with SIL 3
- Typically for ESD and High Integrity PSD applications



Safety systems integrity

Fault detection and advanced self-test functionality are important aspects to assure that the safety system will be able to perform its specified task on demand.

- Online Watch Dog -testing
- Memory-checks
- Task monitoring
- CRC on communication,
- Final Output Stage Test (FOST)
- Line monitoring

All these functions add to the integrity of the safety system on the installation.

Compliance with standards:

- The K-Safe system can provide functions, which fulfil:
- SOLAS
- IMO MODU CODE
- IEC 61508 parts 1-7 E.d. 1.0
- IEC 61511
- EN60945
- IACS E10
- Det Norske Veritas Rules for Ships
- Det Norske Veritas Rules for Mobile Units
- American Bureau of Shipping
- CCS

In addition the K-Safe can fulfil several other environmental IEC and EN standards. Systems satisfying regulations from Lloyds Register of Shipping can also be delivered.

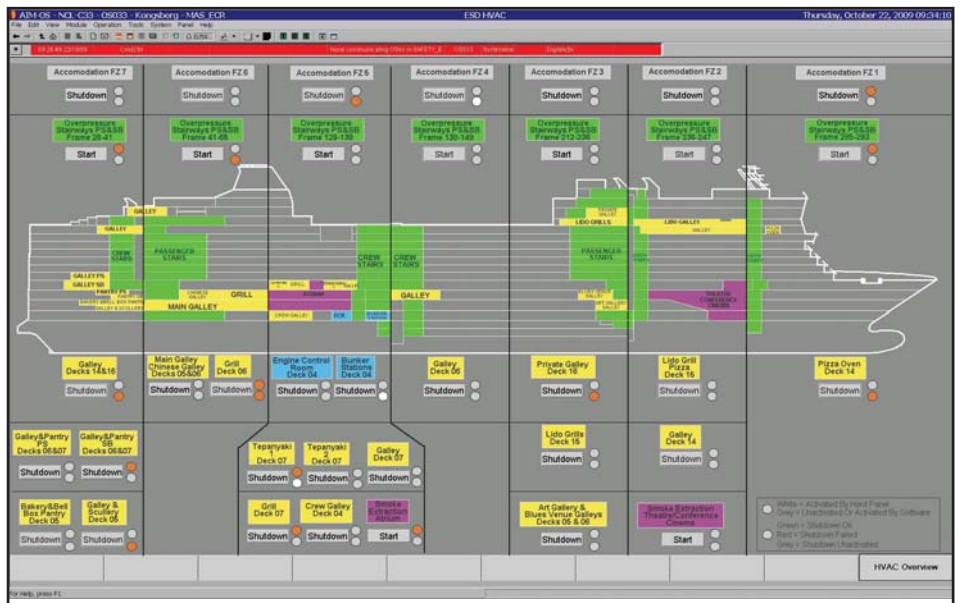
Given the above list, experience shows that most requirements from other relevant standards can be met.

Proven in use for:

- Oil/gas production installations
- Drilling rigs and ships
- Flotell installations
- LNG carriers
- Ships with gas fuel engines
- Gas terminals
- Cruise ships

IMS applications:

- Fire Patrol
- K-Safe Tracking System (Mustering Stations)
- K-Safe Safety Desk (Computerised Safety Desk)
- K-Safe DSS (Decision Support System)
- ASR (Automatic Shutdown Report)



Engineering:

Kongsberg Maritime can assist in creation of configuration input documentation needed for the software configuration of the system.

- F&G and ESD Philosophy
- Fire Protection datasheets
- ESD Shutdown C&E
- GA drawings with fire zones
- IO list for F&G and ESD
- Detector layout



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