

## SOTR FOR TECHNICAL REQUIREMENTS OF SICADS

1. The system should be a fixed, Ship Installed Chemical Agent Detection System (SICADS) providing a rapid and continuous, real time facility for monitoring the presence of chemical agent and their levels in the outside atmosphere and within the ship (in case of citadel breach). The unit is required to be installed inside the ship and should sample the outside and inside environment. It should preferably incorporate a facility for changing over to periodic monitoring, to reduce power consumption.
2. The system should detect and be responsive to all known chemical warfare agents including all precursors, degraded or poor quality chemicals and preferably all mixtures like Mustard Gas and Lewisite. The core technology should be such that it involves minimum consumables and operator maintenance.
3. The standard display should incorporate. a digital read out for levels of different agents, either through continuous scanning or a fixed read out for a specific agent, Cin selection based on user demand including the level of concentrations. Provision of graphic display, where individual activated sensor along with ship layout could be displayed is desirable.
4. The number of sensors fitted on the ship should be commensurate with the size of the ship so as to cover all arcs and approaches simultaneously. The standard fit would include two sensors for the upper deck (one forward, one aft- one port one stdb)
5. Additionally inboard units are to be installed, at least one in each citadel, to sample the air from within the citadel and monitor the breakthrough of NBC filters in the AFU system. A remote alarm unit to achieve a single point monitoring in the Ship Control Center I NBCD HQ1/DCHQ as the case may be, is required to be provided. For a normal frigate at least four sensors would have to be provided. In case during the final design, the ship is divided into more citadels, the number of units will increase proportionately.
6. SICADS should have the capability to detect and indicate the individual activated sensor to control unit as well as to• the external interface i.e Integrated Platform Management System through a serial port. The capability of SICADS to detect, identify and indicate the strengths of at least three agents simultaneously is desirable.
7. The SICADS should have the capability to provide a visual and an audio alarm at programmable threshold levels of chemical agents. It shall not respond to or -be inhabited by interfering substances likely to be encountered in typical naval environment .The sensitivity of the system sensors is to be optimised to minimise false alarms..
8. The time required by the system to attain readiness for operation should not exceed two minutes. System reprogramming should be fast and easy. The system must have protection against overloading.
9. The equipment should be capable to detect toxic chemical agents in liquid, aerosol and vapor form and should conform to following sensitivities:-

(a) Essential Features:

- i) Detect all known Nerve Agents
- ii) Detect all known Blister agents
- iii) C Ability to detect any new agents and precursors.

(a) Desirable Features:

- i) Detect all Blood Agents
- ii) Detect all Choking agents
- iii) Capable-of detecting liquid toxic chemical agents as well.

10. The SICADS should preferably have a facility to change over from operational mode to training mode.

11. A provision for programming the capability-to detect at least 10 new agents must be inbuilt in the system.

12. The system should be capable of being interfaced with and integrated with other Ship-board Surveillance and Damage Control systems. The firm is required to provide interface details of the system for connectivity with other Ship-board Surveillance and Damage Control system. The SICADS should be capable of being integrated with a IPMS type system through a serial port.

13. The system should be modular in design for ease of maintenance and to facilitate repair by replacement.

14. Built-in test equipment (BITE) is to be provided for self-checks during operation. The system should display fault information upto component level during such test and in case of faults, whilst in use.

15. The Remote Alarm. Unit should provide for indication of individual detector pickup levels, thereby assisting in formulation of a directional picture of threat."

16. The SICADS should be tailored to withstand the tropical marine environmental conditions as per JSS 55555 or equivalent standards.

17. It is desired that the system be nuclear hardened.

18. The system should be EMI I EMC compatible with shipboard equipment conforming to EN 50081-1(MIL STD 461 E/F) and susceptibility specification EN 50082-2 {MIL STD 462} which is an essential requirement.

19. The equipment should be able to withstand shocks as per NSS 2.

20. The system is to have long asset life of not less than 30 years. The system should remain unaffected by rain, dust, snow ice, sea spray, relative winds of upto 110 Km/hr. The system should have a MTBF of not less than 1000 hrs. MTTR of less than 10 minutes at operator level and less than 45 minutes with direct support is desirable.

21. The type and rating of the equipment and its components should be compatible with its service demands. Its size, weight and complexity should be held to a minimum, consistent with reliable and economical operation and maintenance. The machinery should operate in a satisfactory manner over its entire operating range, without exceeding the noise and vibration levels. Equipment, its components and piping should be arranged and installed to permit ready accessibility for operation, inspection and maintenance.