

Signatures, Shock & Airborne Noise Management

The Signatures, Shock & Airborne Noise Management team (referred to as "Signatures & Shock" for convenience) is a subgroup of the Submarines transverse (i.e. cross project) Engineering function, Signatures & Dynamics which also includes the specialist Shock and Dynamics and NAVED teams.

The team's responsibilities are project specific, however, its cardinal generic aims are to:

- Ensure the Submarine's engineering design is controlled to minimise the platform's far-field Signature potential (both acoustic and non-acoustic)
- Ensure the Submarine's engineering design is such that platform vulnerability (to weapons attack and environmental conditions) and survivability performance targets are achieved
- Ensure the Submarine's engineering design allows for acceptable compartmental airborne noise levels
- Ensure that the design features contributing to achieving these performance targets are effectively implemented throughout all stages of design and build.

The specific areas of responsibility are: -

Signatures (Susceptibility)

Susceptibility is associated with the ability of the submarine to remain undetected (a fairly key attribute of a naval submarine), by hostile/enemy platforms. This is addressed by limiting the acoustic and non-acoustic signature of the vessel, for the acoustic signature, through the control of the boat's Target Echo Strength and radiated mechanical structure-borne vibration (from rotating machinery, airborne noise etc), and other non-acoustic signatures (such as thermal, electromagnetic, visual, Radar Cross-Section etc).

Shock (Vulnerability)

Vulnerability is associated with the ability of the submarine to remain operational after certain contracted attack scenarios. This is addressed by implementing shock protection systems and allowing adequate clearances to protect the equipment and crew from the high accelerations engendered from weapons explosions. Also by ensuring the submarine has an appropriate level of resilience, in terms of the design of its structure and equipment, to resist the predicted accelerations.

Airborne Noise

Excessive airborne noise levels are principally associated with reduced crew comfort, health and effectiveness but can also, if extreme, lead to a degradation of the signature performance of the vessel. Therefore, the airborne noise characteristics of the vessel must be managed and controlled.

Externally Generated Vibration

Externally-generated vibration is associated with the ability of the vessel's equipment to resist fatigue related failures resulting from structure-borne vibration naturally occurring in a submarine's structure. For critical and vulnerable equipment, a level of performance is required to be demonstrated.

Role Responsibilities

For all of these areas, a "Signatures & Shock" Engineer is responsible for:

- Setting coherent, workable design/build policies and processes to achieve the required Signatures & Shock performance targets

- Managing the customers (and stakeholders) expectations relating to these policies and processes
- Ensuring a suitable level of awareness of the policies and process at all appropriate levels of the business
- Auditing the design and build for compliance with these policies and processes
- Setting individual system and equipment Signatures & Shock performance targets
- Validating equipment performance characteristics by organising and managing physical (Signatures performance and Shock) trials
- Reviewing equipment suppliers' technical deliverables for acceptance
- Resolving (inevitable) design and build deviations with considered solutions
- Providing technical advice to Engineers and equipment suppliers
- Collating, substantiating and presenting qualification evidence
- Producing compliance reports as evidence of demonstrated performance.

Key Characteristics

Applicants should have:

- An Engineering or Science Degree or a demonstrable sound understanding of engineering fundamentals, especially in the area of dynamic, mechanical systems and achieved a 2:1 result
- A familiarity with Computer Aided Design (CAD) systems, engineering drawings and Finite Element Analysis (FEA)
- An intermediate to advanced skill level on common Microsoft applications (i.e. Windows, Word, Excel, Access etc.)
- The ability to readily evaluate situations and offer considered and creative solutions
- An efficacious communication ability, in both conversational dialogue and formal/technical written language
- The ability to assimilate technical data (such as dynamic analysis results) and apply to real world situations
- Experience in managing small projects and the ability to work to constrained time-scales
- An enthusiasm and commitment for self-development and learning goals.