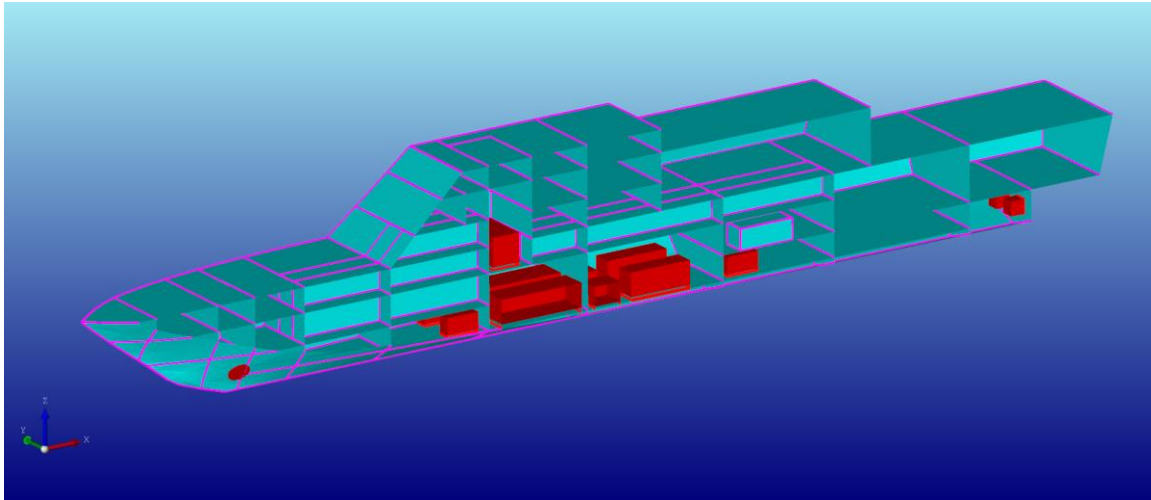


SELECTED PROJECT PORTFOLIO

**Project:** Noise Induced Hearing Loss (NIHL) Study  
**Operator:** U.S. Navy & Maritime Sealift Command  
**Client:** Office of Naval Research

**Services Provided:**

- To assist the Navy with reducing noise induced hearing losses (NIHL), NCE implemented major updates to Designer NOISE<sup>®</sup> - NCE's noise prediction software. Expansion of program capabilities included: addition of Time Weighted Average (TWA) exposure computation, evaluation of topside noise, addition of non-acoustic impacts, more advanced HVAC solver algorithms, and addition of structural stanchions elements.
- Improved methods to predict shipboard source levels, account for acoustic transmission paths, and receiver room acoustics. Identified absorption, transmission loss, radiation efficiency, acceptance and damping as critical parameters needed to noise control treatments.
- Drafted and provided inputs to improved noise requirements, such as Mil-Std 1747, Design Criteria Standard, Noise Limits.
- Developed acoustic databases for sources and acoustic material performance.
- Provided hearing conservation information. Evaluated methods to model impulsive noise in order to understand its transmission, possible abatement and effect on hearing.

**Results**

- The updates were validated against measured data on dozens of vessels and shown to accurately predict and control noise on existing and future vessels.
- Advanced science and thinking on the parameter and methods to determine when NIHL occurs in sailors.