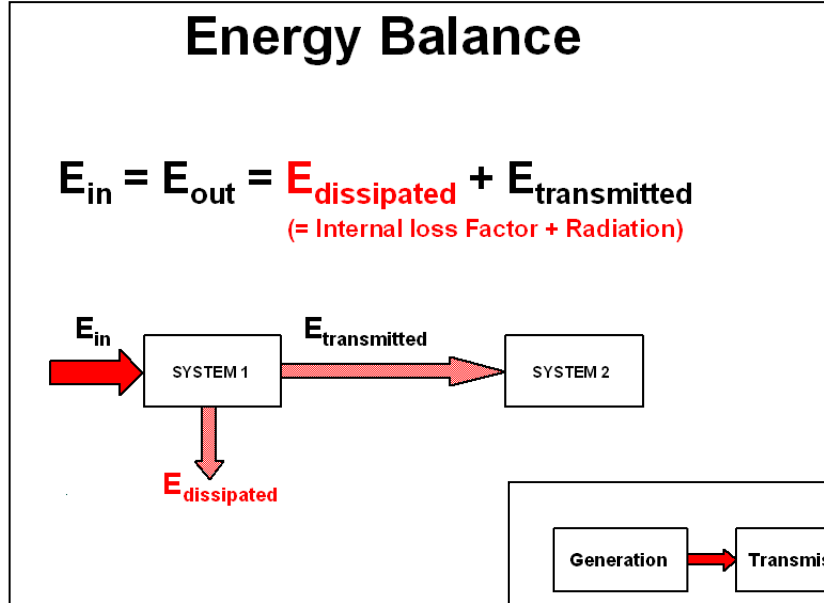
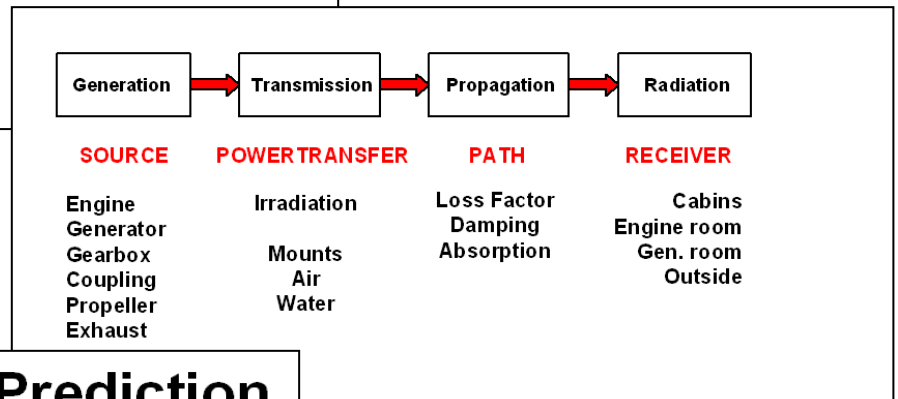


Statistical Energy Analysis Principle

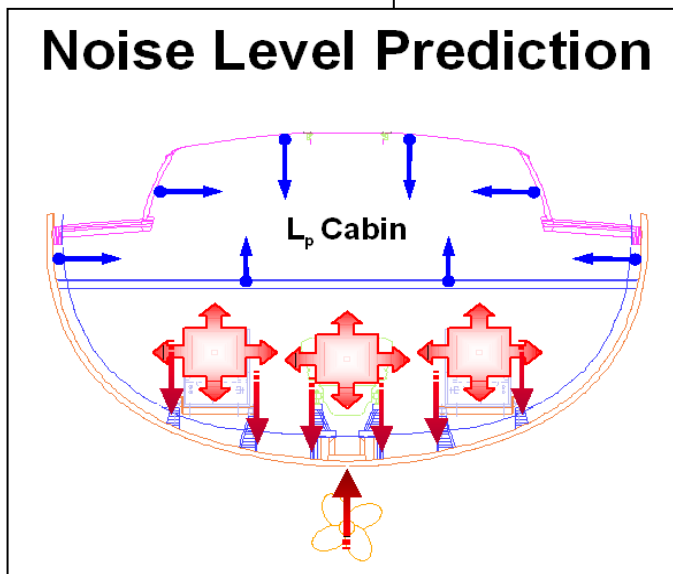


Statistical Energy Analysis (SEA) provides a framework for studying diffusion of energy in a structure.

SEA is based on a classical power balance. Power is defined as the average rate of change of energy. At steady-state, all power flowing into a system must be dissipated internally or transmitted to some other system(s).



SEA - Practical Applications



Implementation of **SEA** in a computer code (AutoSEA) provides us a **CAE** (Computer Aided Engineering) tool that can predict noise and vibration response and perform design analysis in complex vibro-acoustic systems.

SEA is applied over a wide frequency range from mid-to-high frequencies. For many applications in the yacht building industry this corresponds to frequencies from 100 to 8000 [Hz].

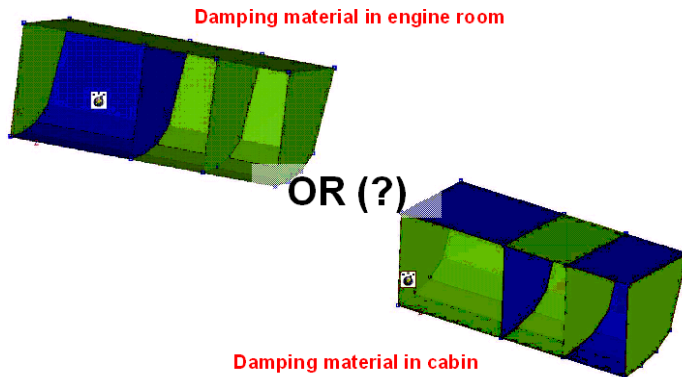
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SEA - Practical Applications

Fine Tuning

using isolation materials to their full potential



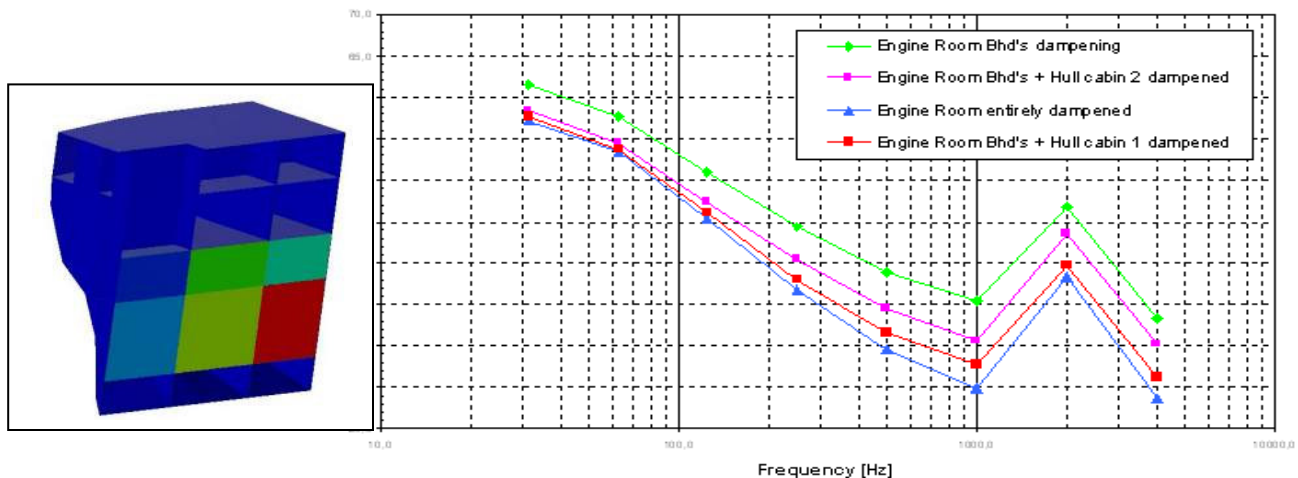
SEA provides a framework for understanding noise transmission:

- Tool for identifying major energy flow paths.
- Noise contribution analysis.
- Design sensitivity analysis.
- Development and evaluation of sound packages.
- Responses to different noise sources:
 - Engine noise
 - Gearbox noise
 - Propeller induction
 - Underwater noise
 - Etc.

But most important, a **SEA** model can span a large design space with many components, each with multiple design parameters (materials, loss factors, sound treatment, etc.), displayed in a full 3-dimensional model.

Sound Pressure Level

Cavity in Cabin 2



These models provide comprehensive pre-visualization for:

- Efficient usage of damping and insulation treatment which could lead to possible weight and cost savings.
- Improved and quicker response to customer's questions, demands and possible alternative material proposals.
- Frequency span can be expanded up to 10.000 [Hz].
- Detection of dominant sound path(-s) within the ship's structure.
- A more reliable model to predict sound and vibration in fiber composite structures or other orthotropic materials.

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