

Engineering Consulting

The flexibility of our business model allows us to tailor our services according to the individual needs of each client, offering optimum results.

We have special expertise in the following fields:

- **Problem resolution**

Analysis, diagnosis and solution of technical and structural problems encountered, for example, in plant equipment and machinery.

- **Design**

Identification of needs and requirements and their translation into technical specifications for the development and evaluation of conceptual design solutions that lead to effective system and product designs.

- **Auditing**

Analysis, evaluation and validation of third party structural and/or electromechanical system designs that necessitate a second opinion.

- **Forensic engineering**

Investigation of structural failures and determination

of their causes. This service is tailored specifically for legal litigation.

Methodology

SEC implements a structured scientific approach to its projects that ensures deliberate and controlled progress towards a successful outcome while minimizing cost and technical risk:

- **Extraction of requirements and setting of specifications**

We apply proven strategies to define and prioritize our clients' needs, and thereby derive a set of consistent and achievable requirements, technical specifications and verification metrics. This aspect of the design process is often overlooked, resulting in designs that do not thoroughly fulfill the needs of the client.

- **Conceptual development**

We rely on structured methods to promote creativity and free thinking in concept generation. All contributions are considered and evaluated when selecting or creating the final concept. The process of concept development also contains an initial estimate of design performance as well as costs.

- **Engineering design and analysis**

Once a concept is selected, a design is developed using an iterative approach that strives to satisfy conflicting requirements. For example, performance and cost will always be in conflict since maximum performance is wanted at a minimum cost. The art of engineering is to arrive at the optimal compromise in the minimum number of iterations.

- **Prototyping and validation**

Engineering designs are turned into functional prototypes with the purpose of validating, through testing, whether key performance requirements are met. The performance characteristics are then fed back into the design process to optimize the solution. The level of sophistication of the prototypes is always tailored to minimize the cost of testing and maximize the value of the gathered information.

Tools and capabilities

In addition to our technical expertise, we employ a wide range of advanced engineering tools and methods in our work that ensure high quality, realistic and cost effective solutions:

Computer Aided Design

State of the art 3D computer aided design using PTC Pro/ENGINEER and SolidWorks.

Finite Element Analysis

Noran Engineering NASTRAN

- Linear Static Analysis
- Normal Modes Analysis
- Buckling Analysis
- Steady State Heat Transfer
- Non-linear Static Analysis (non linear materials and loads)

- Dynamic Response (transient, frequency, random and shock)
- Transient Heat Transfer

LSTC LS-Dyna

- Nonlinear Dynamics
- Explicit and Implicit Time-Stepping
- Eigenvalue Analysis
- Thermal Analysis
- Fluid Dynamics
- Fluid-Structure Interaction
- Failure Analysis
- Crack Propagation
- Contact Analysis
- Multi-Physics Coupling (structural, thermal fluid, acoustics, etc.)

In all of our analyses we can support composite laminate materials, temperature dependent materials and super elements.

Our integrated scientific approach will ensure that we provide you with a cost effective solution that fulfills all your needs and expectations.

Please contact us if you are interested in learning more about SEC.

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