



Experience

Many years of experience built up solving many different types of engineering problems form the basis of SEC's services offered. These projects, spanning many different fields, range from the solution of engineering and plant technical problems to technology and product development.

Selected projects

- Study on the feasibility of a smart restraint system for helicopter aircrew personnel that operate standing during flight. The system is intended to be able to measure and identify flight conditions, and make decisions based on a control algorithm to determine the appropriate level of restraint intervention and damping to reduce peak loads and crew displacement.
- Conceptual development of a Contained Sample Handling and Analysis System that will form part of the Sample Receiving Facility for the receipt and analysis of material eventually returned from Mars. Currently in its feasibility analysis and concept development stage, the CSHAS is envisioned to provide all of the materials transport, data management and process scheduling functions between the various modules of the SRF, as well as some of the specialized analysis modules such as Cell Culturing, Sample Banks, Microscopy and Materials Incubation.
- Development of a polymer-based hemorrhage control device intended to treat deep wounds in the proximal extremities. Through the action of the specially formulated polymer, the device is able to absorb the water component of the blood lost to swell and apply pressure while forming a seal. The absorption of water also helps the blood to coagulate with the aim of enhancing clot formation.
- Development of a water activated neck seal for use in the Helicopter Aircrew Integrated Life Support System, which is a flight suit for Navy aviators that integrates all the life support functions required to deal with accidents at sea. One of the layers in the system is a dry suit membrane. The goal of this project was to develop a neck seal that would be comfortable to wear under normal conditions, would allow airflow for system cooling, but would be activated instantaneously on contact with water. The device uses a specially developed formulation of superabsorbent polymers as the actuator.
- Structural analysis and design of a Cell Culture Unit destined for service aboard the International Space Station, in which the goal was to reduce mass while maintaining structural integrity under launch, landing, emergency landing and on-orbit loading conditions.
- Structural and buckling analysis in a forensic engineering investigation to determine the cause of the 1994 collapse of a large warehouse rack system.
- Analysis and stress classification of the lifting trunnions and tray beam support bracket of two methanol wash towers in a South African petrochemical plant.
- Optimization of structural design for mass reduction

in armored vehicles.

- Design audit: Shaft steelwork of the Phalaborwa Underground Mining Project.
- Static analysis, dynamic analysis and fatigue life evaluation of the all-aluminum General Freight and Liquid Trailer semi-trailer – GFLT.
- Design and analysis of a post-tensioning cable system aimed at providing an increased margin of safety in the use of a 58000 ton thin walled, gas liquor storage tank to its full capacity.
- Design optimization of the scissor mechanism and analysis of a 45-ton Copelyn tipping semi-trailer.
- Analysis of the life cycle of a high pressure steam turbine casing including transient and steady heat transfer and stress analysis, accounting for non-linear material models, contact and creep.
- Analysis and design audit of the Paris arch dam in Kwazulu Natal, South Africa.
- Transient heat transfer and stress analysis of a catalyst reduction reactor.
- Investigation of the dynamic behavior and structural integrity of the Majuba Power Station condenser support platform.
- Finite element static and dynamic analysis of the West Wits ball mill foundation.

- US Air Force, USA
- US Army, USA
- US Naval Air Command, USA

Please contact us for more details on any of the abovementioned projects or if you are interested in learning more about SEC.

Serra Engineering Consultants

Jägerstrasse 2
8406 Winterthur
Switzerland

Tel: +41 52 202 4104

Fax: +41 52 202 4104

Email: info@serra-engineering.com

Web: www.serra-engineering.com

Selected clients

- Anglo American Corporation, South Africa
- Bateman Engineering, South Africa
- Cargo Carriers, South Africa
- ESCOM, South Africa
- Grado Zero Espace, Italy
- Henred Fruehauf, South Africa
- NASA, USA
- Nightsky Systems, USA
- Payload Systems Inc., USA
- Rapperport Associates Inc., USA
- Reumek Ermetek, South Africa
- Rotek Engineering, South Africa
- SASOL, South Africa
- Starboard Innovations, USA
- TSE, Italy