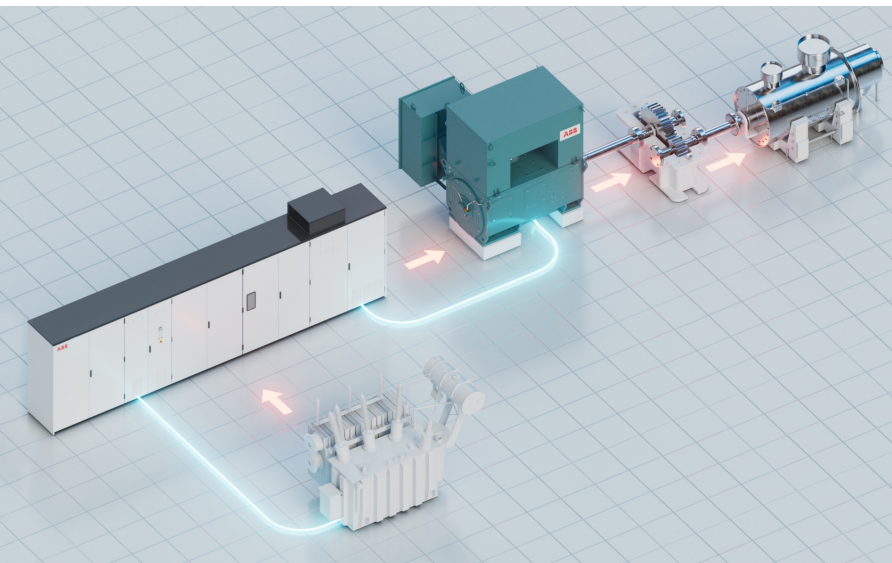


# Electromechanical System Interaction (EMSI) consulting service

Increasing the lifetime of your drivetrain



Do you want to avoid issues when ramping up and operating your new or existing drive system installation? The Electromechanical System Interaction (EMSI) consulting service identifies potential critical points of failure or performance degradation in a drive system and provides the relevant mitigation actions and system-wide performance improvements.

**ABB's EMSI consulting service comprises:**

- Expert guidance on control design for electromechanical systems
- Understanding the process priorities and system-limiting factors
- Support for mechanical concept design from an automation perspective
- Performance analysis and recommendations for existing installations
- Mechanical system operational stress analysis
- Optimized control settings for minimal sub-synchronous torque and control interactions (SSTI, SSCI)

The EMSI service follows a structured approach starting with defining and focusing on the relevant parts of the drive system, identifying potential installation issues, assessing and prioritizing risks, developing and implementing the right solution.

**Main benefits**



**Maximized uptime**

- Mitigate unwanted effects due to electromechanical vibrations
- Protect the installed equipment



**Cost optimization**

- Minimize system design iterations and installation time
- Increase the lifetime of the underlying equipment



**Co-innovation**

- World-class consulting service and collaboration to develop new solutions

# EMSI consulting service



## Basic

- + Drive system setup
- + Operation history
- + Control parameters optimization



## Detailed

- + Basic check
- + Workshops with the customer
- + Detailed alarms/events analysis
- + Optimization of selected subsystems



## Advanced

- + Detailed analysis
- + Operational stress analysis
- + System improvements
- + Co-development of novel control and monitoring features

### 1. Basic EMSI consulting service

This service offers a check on the health status of an existing drive system, including the operational history and lessons that can feed into the optimization of the drive's control parameters and settings. Both torque and speed control loops play a key role in defining the response of the drive and subsequently the underlying process control. Optimally tuning these control loops can potentially achieve cost savings in the mechanical and electrical systems, by avoiding unnecessary safety margins and shutdowns. This increases the system robustness and process throughput and extends the equipment lifetime.

### 2. Detailed EMSI consulting service

ABB's experts analyze the full electromechanical system comprising, for example, the electric drive, motor, gearbox and compressor. We run workshops with you to learn about your process priorities and any factors that impose limits on the system operation.

For new installations, ABB consults on the mechanical system concept design and how the electrical and mechanical systems interact in closed loop. In addition, advice is shared on how electrical drives offer new options for automating what would otherwise be fully mechanical setups. ABB uses high-fidelity simulation twins of the underlying electromechanical system to assess and compare the performance of various designs.

For existing installations, ABB offers a detailed performance analysis and provides recommendations on potential improvements, for example for large-scale test facilities or gas liquefaction setups.

Electric drives have multiple sensors and powerful control and data-processing units, which enable the collection and analysis of electromechanical system data. This data, together with ABB's experience gained through a large globally installed base of electric drives, can then be used to recommend the best actions for performance improvements. Such recommendations could include reducing transient effects, increasing system availability, dampening mechanical oscillations, increasing control margins, and reducing any plant-wide interactions at sub-synchronous frequencies.

### 3. Advanced EMSI consulting service

ABB provides a long-term operational stress assessment of the electromechanical system and comprehensive solutions that may include co-innovation activities. For example, extra monitoring equipment can be installed with additional computational possibilities to better handle transient and steady-state operational stress. Alternatively, advanced active damping mechanisms can be custom-designed for an existing or new electromechanical system. Moreover, novel optimization-based control methods can be deployed to improve the transient response of the overall system and allow it to better handle large variations on the boundary conditions from the grid and/or the process.

For more information, please contact your local ABB representative or visit:

[new.abb.com/service/motion/planned-services/engineering-and-consulting](https://new.abb.com/service/motion/planned-services/engineering-and-consulting)

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