Driving electronic power steering innovation through model-based development

Context

A global automotive company pioneering innovative steering solutions through precision engineering sought to reinforce its competitive edge through model-based development (MBD) best practices for its electronic power steering product line. Consistent, high-quality modelling practices were required to meet electronic power steering technology's stringent safety and performance standards.

Challenges

- Adhering to complex modelling guidelines was challenging for the client.
- High incidence of errors resulting from inconsistencies in following the MXAM modelling guidelines hindering process efficiency.
- Quality and accuracy issues across the MBD lifecycle impacted model deliverables.

Robosoft services

- Model-based development leveraging industry-leading tools: MATLAB, Simulink, Stateflow, and TargetLink.
- Conducted MAAB guideline checks using MXAM tools, with MXAM script improvements and modifications for modelling accuracy and efficiency.
- Implemented automatic code generation through TargetLink, streamlining the development process.
- Developed detailed unit-component design documentation to facilitate traceability.
- Implemented a systematic MBD design review process through checklists to ensure the quality and integrity of the models.
- Rigorous SWC test specification creation, ensuring functional perspectives for reliability.
- Comprehensive functional and structural testing (SIL, BTC), covering both specification and implementation aspects.
- Employed Polyspace for stringent static analysis and source code design checklist for quality assurance.

Value delivered

- New orders soared for the client due to the improved quality and accuracy achieved through our model deliverables.
- Enhanced quality and accuracy of model deliverables, reducing errors and rework.
- Improved adherence to industry standards and guidelines, ensuring regulatory compliance.
- Accelerated time-to-market through efficient modelling and testing practices.

Key technologies and standards

- MATLAB
- Simulink
- Stateflow
- MXAM
- TargetLink
- Polyspace BF/CP
- ISO 26262
- MAAB
- MISRA
- ASPICE