The BMW Group recently evaluated production code generators. What were the reasons for carrying out this extensive evaluation project?

S.-A. Schneider: The starting-point was our definition of a new process that could handle future development requirements. We needed a tool chain that was tailored to the new process. So it goes without saying that we examined the available options thoroughly.

What changes were you aiming to make, compared with previous processes?

R. Meinlschmidt: Our objective was a seamless, tool-supported process, from specification, through the analysis and optimization of control algorithms, to automatic code generation. The MATLAB/Simulink/Stateflow development environment was to be integrated as a central element. Another objective of the new process was to introduce new modeling guidelines to give users optimum support in a distributed development environment, along with model creation and code generation procedures that would meet Safety Integrity Level 3.

How did you set about performing the evaluation?

S.-A. Schneider: To start with, we agreed on a comprehensive scoring scheme. Divided into five areas, with 18 categories and 96 criteria, 21 of which were knockout criteria that were visible at the decision level.

What were the criteria?

S.-A. Schneider: In addition to general tool properties, we also evaluated the extent of support given to Simulink/Stateflow functions, suitability for use in safety-relevant applications, integration into the development process, and of course the properties of the generated code itself.

What was the next step after completing the evaluation?

R. Meinlschmidt: We realized that we had to harmonize processes and tools for direct use in everyday project work. We did this by analyzing the existing processes and production projects that were already running with TargetLink. The insights gained from this were incorporated in a method manual for using MATLAB/Simulink/Stateflow and TargetLink. The resulting workflows were then automated in accordance with the process. TargetLink’s application programming interface,
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How important to you are future adaptations to your processes and tool chains?

S.-A. Schneider: Adapting the tools to our processes is very important to us, to ensure we derive maximum benefit from the tools. We also want to keep in close touch with the tool suppliers, so that we are informed in good time of their development strategies, and can make our own requirements clear to them. We’re on the right road with TargetLink and cooperation with your company.

In concrete terms, what do you expect of TargetLink in upcoming production projects?

S.-A. Schneider: We want a seamless, optimized development process that will cut development times, simplify iterations, and guarantee reliable implementation of the modeled functions on the target hardware. We chose TargetLink to do this. So that we can be flexible and integrate existing code into the autogenerated code if need be, the good readability of TargetLink code is very important to us.

R. Meinlschmidt: Alongside expectations regarding the actual tool, we also want fast, competent support from the tool supplier.

To what extent will the BMW Group use automatic code generation?

S.-A. Schneider: Our goal is to use automatic code generation wherever we do model-based development. It’s the way to go: Model-based development and MATLAB/Simulink/Stateflow will grow in importance, and therefore so will automatic production code generation.

Thank you for talking to us.

“We want a seamless, optimized development process that will cut development times, simplify iterations, and guarantee reliable implementation of the modeled functions on the target hardware. We chose TargetLink to do this.”

 Robert Meinlschmidt, process development in the electronic development department.