OEMs and suppliers are today facing the challenge of implementing the ISO 26262 standard into all of their model-based development process activities.

The major goal of the process deployment services offered by Model Engineering Solutions (MES) is the complete coverage of the ISO 26262 standard in model-based development. Achieving this goal requires a well-defined and cost-effective development and V&V process that relies on the best practices from the automotive industry.

MES Academy consultants are highly specialized in model-based development processes for safety-critical software development. They are experienced in company-wide introduction and implementation of ISO 26262-compliant development processes for any code generation tool, be it Embedded Coder or TargetLink. The definition and introduction of an ISO 26262 process is carried out worldwide by senior consultants from the MES Academy.

MES’ objective is to further customer competencies in model-based development, regardless of where they currently stand.

The MES ISO 26262 Process Deployment Service creates or adds to existing process and development documentation, and is adapted to customer requirements. MES consulting clients include major OEMs and suppliers to the automotive industry like Audi, Bosch, Continental, Daimler, EvoBus, Hella, Siemens, Takata, Volkswagen, WABCO, and ZF.

ISO 26262 Compliance
ISO 26262 provides important recommendations for software development. MES supports its customers in efficiently implementing these recommendations in all relevant phases of software development. Significant development phases are:

- Deriving safety requirements
- Designing software architecture
- Designing and implementing safety functions in models
- Guideline compliance testing and managing model complexity
- Quality assurance of models for safety-relevant applications

The 5 stages of the MES ISO 26262 Deployment Service
The MES Academy process deployment services consist of five levels, each one building on the last:

1. Analysis of existing processes, methods, and tools
   In the analysis stage, MES works closely together with the customer in order to identify missing or insufficient activities and work products. Examples of tasks carried out in the analysis stage are:
   - Reviewing the current development process and tool chain
   - Conducting a structured ISO 26262 Gap Analysis to identify missing development or safeguarding activities
   - Developing and prioritizing a roadmap for defining and implementing an ISO 26262-compliant development process

2. Development of a process manual
   In this stage, processes and methods are developed together with the team and other stakeholders on the customer side. The process documentation describes the required activities and work products that are...
to be used in detail. Clear definitions
state (1) what to do, (2) when to do
it, and (3) what the expected result
of each individual process step is
(e.g. criteria for success and quality
goals). A process manual documents
the determined process and typically
consists of the following descrip-
tions:

- Graphical process maps that pro-
  vide an overview of the activities
to be carried out
- Comprehensive definition includ-
  ing goals, prerequisites, and inputs
  for each process step
- Definition of work products
- Definition of roles and tools in-
  volved in the individual activities
- Goals and criteria for success for
each process step

3. Creation of developer
  manuals
The process manual is supplemented
with a developer manual, which ex-
plains how to use methods and tools
for software development and qual-
ity assurance. The developer manuals
capture how to design and achieve
embedded software of the highest
quality. Examples of topics covered
in such a manual are:

- General pattern for automotive
  control function design with Sim-
  ulink
- Model structures for safety-critical
  software
- Use of Data Dictionaries or para-
  meter libraries
- Model interface design
- Application-specific modeling pat-
  terns, also for AUTOSAR software
development
- Use of libraries and referenced
  models
- Development of larger models
  with software variants
- Best practices for reducing re-
  source usage of the generated
  code
- Modeling for the traceability of re-
  quirements

4. Implementation of ISO 26262-
  compliant development
Using the available process manual as
a basis, MES consultans show cus-
tomers how to use enhanced and
 customized reference workflows for
series production projects.

- Team member training on how to
  use the new processes on the basis
  of process and developer manuals
- Support in applying the process
  manuals in series production pro-
  jects
- Assessing the successful imple-
  mentation of the new process
- Assistance in optimizing the new
  process
- Improvement of the process and
development manuals in accord-
ance with new requirements

5. Development support
In the last stage, MES assists projects
with production relevance via inde-
pendent development services.

- Ongoing management and devel-
  oper support in applying the pro-
  cess to existing series production
  projects
- Service provision, including safety
  management/analysis, modeling,
  code generation, etc.

These services are provided in collab-
oration with the MES Test Center.

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