Bring your tools together

To cope with the development and operation of a complex space system, a powerful set of development tools is essential:

- Computer Aided Engineering & Design
- Software Development Tools
- Simulation Tools
- Integration & Test Tools
- Engineering Databases
- Operation Support Tools
- Training Facilities

In the past, dedicated tools have been produced for each phase in a project. This approach leads to:

- inconsistent interfaces
- incompatible data structures
- different information repositories

and hinders the free transfer of basic engineering data. Typical consequences include labour-intensive work-arounds, with potential cost and schedule overruns.
A seamless world of tools

CGS is an integrated "versatile" software toolset. In an integrated system solution, CGS is used as the common software in all ground facilities:
- Software Development Environment (SDE)
- Software Validation Facility (SVF)
- Avionics Test Bench / Electrical Test Model (ATB/ETM)

CGS links the processes and phases of development and production together, eliminating singular solutions and incompatibilities in the development flow.

The central engineering database of CGS provides the common data information repository for all facilities and ensures data consistency for each facility.

This concept saves significant effort in data reformatting, data verification and data exchange.

Mission Database (MDB) as central Engineering Knowledge Repository:
- System Description / Expert – Diagnosis know-how
- Telemetry / Telecommand Data
- Simulation Models
- Procedures
- Display Definitions

Schematic for ATV project
Key features

Simulation models are created with CGS through the support of a graphical model development environment. Predefined model function libraries are provided for simulation development.

Test- and checkout tasks are supported in CGS through:
- Development of automated procedures
- Synoptic Display Definitions
- Real-Time monitoring and Control Functions

- Event Logging and Data Archiving
- Test Evaluation Software

The powerful language concept in CGS provides the means for:
- Test Automation
- Flexible User Control
- Configurability in User Libraries

The CGS Database (MDB) concept enables parallel, distributed data development at different geographical locations, and the easy exchange of data between these locations. Data integration is a built-in feature of CGS, achieved by an ownership concept protected by security and consistency mechanisms. The configuration management features of CGS ensure seamless consistency of data, software and documentation.

The single-source principle for all ground facilities, implemented in the CGS MDB, provides the central engineering knowledge repository also available for diagnostic systems.
<table>
<thead>
<tr>
<th>Project</th>
<th>Facility</th>
<th>Customer</th>
<th>Location</th>
<th>Description</th>
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<td>SVF</td>
<td>NASA</td>
<td>Houston</td>
<td>SW Verification Facility</td>
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<td>Turin</td>
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</table>
Technical Data

HW/SW Platform
- SUN / Solaris
- Intel / LINUX (in 2003)
- Oracle Database
- Dataviews

Configurations
- Minimum:
  - Single computer for Database, Test Node and Workstation
- Maximum:
  - 1 Database Server
  - 32 Test Node Computer
  - 32 Work Stations

External Interfaces
- Data exchange using XML formats
- Export/Import with commercial tools (Excel, PVWAVE, Matrix-X)
- Application Programming Interface (API)

Standard Protocols
- CCSDS
- ECSS-PUS (Packet Utilisation Standard)
- ATV-PUS

Astrium GmbH
Space Infrastructure
P.O. Box 28 61 56 · D-28361 Bremen
www.astrium-space.com

Contact:
Tel.: +49 (0) 421 539 5049
Fax: +49 (0) 421 539 4155
cgs-support@astrium-space.com