eXpress™ Newsletter

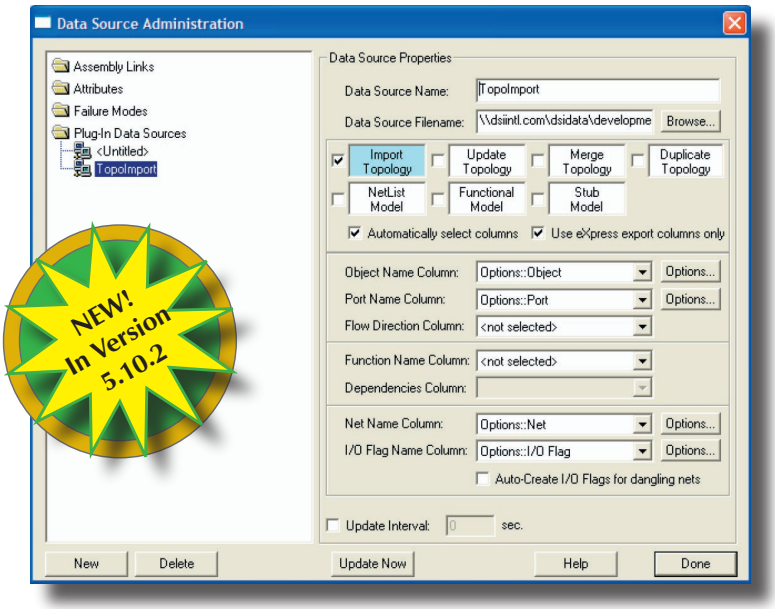
Volume 12, Number 10 Summer 2006

Introducing the eXpress Spreadsheet Topology Import

New from DSI is another time saving capability which has been incorporated into our latest version (5.10.2) of ***eXpress***. The new ***eXpress*** Spreadsheet Topology Import plug-in allows the analyst to import topological and functional data from an Excel spreadsheet file. The following are ***eXpress*** entity types that can be imported or updated using this function:

- Objects
- Ports
- Output Functions
- Dependencies
- Nets
- I/O Flags

The ***eXpress*** Topology Import is created in Data Source Administration (in a manner similar to the other ***eXpress*** imports). Once created, the Data Source Properties panel will appear in the Data Source Administration dialog:



Together with the new Export Topology operation, this plug-in is intended to provide the analyst with a flexible set of capabilities that facilitate the modeling process in a variety of situations, including the ability to:

- Get a quick-start in developing an ***eXpress*** model by importing data available in engineering databases
- Create a "closed-loop" topology update—with ***eXpress*** topology data being exported, modified externally, and then re-imported to update the original design
- Introduce topological changes from an external sources (including other ***eXpress*** designs) without modifying a model's existing test, attribute, state or operating mode definitions
- Speed up the modeling process via the application of the topology import as a power-modeling tool
- Automatically create "stub model" topologies that represent specific sets of testability statistics
- Quickly create "non-topological" models so that otherwise "unmodelable" portions of a design (e.g. "black boxes") can be incorporated into a system model.

So that the ***eXpress*** topology import can support this wide variety of uses, a large number of customizable options have been provided—many more options than the basic ***eXpress*** user would want to master. Therefore, to simplify the importing process, these options have been hidden away in a multi-tabbed options dialog. In fact, for most uses of this plug-in, the import options can be specified with just one or two mouse-clicks—the analyst will not even need to look at the detailed options. Nevertheless, there will be times when the analyst wishes to go beyond the pre-packaged Import Modes that can be selected on the main topology import panel. DSI's documentation on this new topology import capability briefly explains both the "one-click" method and each of the fields on the different panels on the options dialog.

Visit the DSI Website to Download your ***eXpress*** 5.10.2 Update Today!

eXpress Users' Group Meeting AUTOTESTCON 2006

Mark Your Calendar!
Friday, Sept 22, 2006

The annual ***eXpress*** Users' Group Meeting will be held in conjunction with AutoTestCon 2006 being held in Anaheim, CA. September 18-21, 2006. DSI would like to invite our users to share in this great opportunity to hear from industry leaders in diagnostic design, development and implementation. We look forward to hearing from you and your shared experiences. It is from our users that we gain insight into how we can better provide support, capabilities and opportunities where and when you need it most. The ***eXpress*** Users' Group Meeting this year will be on Friday, September 22, 2006, a couple miles east of Disneyland, in Anaheim, California at the J.T. Schmid's Restaurant.
(http://www.jtschmids.com/banquet_catering_i.html)
A complimentary breakfast will be provided starting at 8:00AM. We will start the meeting at 9:00AM and go until about 12:30 PM and reconvene for an informal workshop from 2:00 – 4:00 PM for those that may wish to have some special attention with DSI's technical or management staff.

Inside this Issue...

Designing for Availability
.....it don't just happen

You just signed up to develop and deliver a product with an availability requirement of 95% or better. Now you are trying to figure out how your platform can meet this requirement! An Inherent Availability (A_i) of 95% is tough, but you signed up for an Operational Availability (A_O) with its nebulous Mean Logistics Delay Time (MLDT). Your reliability lead assures you the MTBF can be met, but what about the maintenance down time. The answer to this dilemma: "Design for Availability". If you don't have a full Integrated Team in-place at the start, there is little hope of meeting A_O, or even A_i. The Diagnostics and Logistics Engineers need to be involved at the start, even before parts selection where reliability gets involved.

Using ***eXpress*** early in the design phase drives high Availability into your product design. Designing for Diagnostics along with a solid Logistics integration has a significant impact on Availability, even the MLDT factor:

$$A_O = \frac{MTBF}{MTBF + MTTR + MLDT}$$

Need Rapid Test and Accurate FD & FI with Effective Level of Repair*

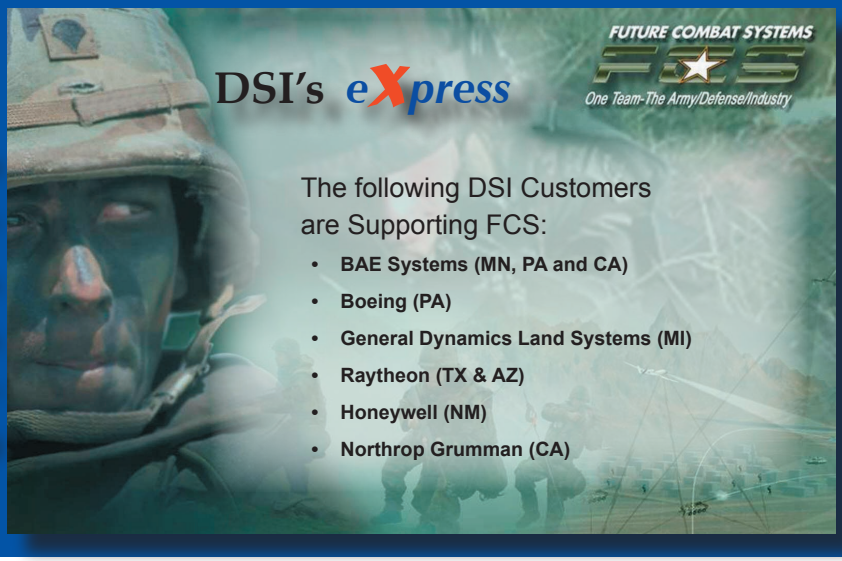
Need Standardized and Low Skill Level Maintainer Requirements Supported by Intelligent Maintenance and Spares Availability*

*Accomplished through effective Diagnostics Design using *eXpress*, the only tool with Functional Diagnostics Design capability

Mean Time to Repair (MTTR) includes not only time required to remove and replace the failed item but the time needed to isolate the fault which is typically measured as the Mean Time to Isolate (MTTI). The MTTI is a direct output from ***eXpress*** models which incorporated diagnostic test times. MTTR also includes the verification test time which can also be provided by ***eXpress***.

Leading the Way...
...Still!

Contact DSI for information about how we can help you and your program integrate diagnostics using proven embedded design approaches, develop effective health management systems, provide prognostics development support, coordinate analyses across multiple platforms, and between multiple companies or organizations.



Training Schedule

Course Number	Pre-requisite	Course Description	Dates	Location	POC
100		System Diagnostics Concepts and Applications	7 Aug, 2006	Orange, CA	Denise Aguinaga , DSI
110	100	Basic Modeling & Introduction to Testing	7 Aug, 2006	Orange, CA	Denise Aguinaga , DSI
120	110	Introduction to Testing & Analysis	10 Aug, 2006	Orange, CA	Denise Aguinaga , DSI
200	120	Advanced Diagnostic Development & Assessment	16 Oct, 2006	Orange, CA	Denise Aguinaga , DSI
205	200	Advanced Test Development & Importing	18 Oct, 2006	Orange, CA	Denise Aguinaga , DSI
210	205	Advanced FMECA Development & Assessment	20 Oct, 2006	Orange, CA	Denise Aguinaga , DSI
100		System Diagnostics Concepts and Applications	13 Nov, 2006	Orange, CA	Denise Aguinaga , DSI
110	100	Basic Modeling & Introduction to Testing	13 Nov, 2006	Orange, CA	Denise Aguinaga , DSI
120	110	Introduction to Testing & Analysis	16 Nov, 2006	Orange, CA	Denise Aguinaga , DSI

Selecting a Systems Diagnostic Engineering Tool

Getting it "Right from the Start"

When tasked with selecting a Systems Diagnostic Engineering Tool, one important consideration is the reduction of the business risk associated with using that tool—something that can only be assessed if one understands not only the various calculations performed by the tool, but also the more basic question of how well the tool meets the overall needs of the systems engineering process. As alternative and/or complimentary tools are identified, the analyst must consider how the strengths of each tool might be leveraged without compromising the primary objectives of the systems diagnostic design.

Diagnostic Engineering Tools should be researched, evaluated, and selected early in the design process—before the Subsystems Design Requirements are derived and "flowed down" to developers (both internal and subcontracted). Furthermore, in order to reap the full benefits of the tool, the diagnostic engineering process should begin extremely early in the design process—well before the selection of specific parts or components (and therefore, well before the identification of specific failure modes). This concurrent, systems-oriented process should influence not only part selection, but also sensor placement, repair item partitioning, redundancy, access, safety, etc.

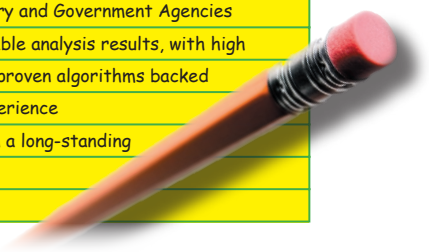
In order to provide effective feedback early in the design process, the Systems Diagnostic Engineering Tool must be able to analyze the diagnostic capability of the *functional* design of the system. If the tool requires that failure modes be modeled before it can provide useful feedback, then that tool will be useless during the phase of development in which it would be cost-effective to implement the results of diagnostic analysis.

As parts are selected and specific modes of failure identified, the tool must be able to not only capture this knowledge, but also integrate it into the existing functional models. Of course, since it is not always possible to enter a program at the earliest design phase, the tool must be able to effectively support modeling and analysis at any stage of development, including work on legacy systems. Moreover, to address all business cases, the tool must support differing levels of effort. In some situations, such as when one needs a quick-and-dirty assessment of an existing design, it is desirable that modeling and analysis be performed with minimal effort, importing as much as possible from existing design databases. In other cases, it may be desirable to develop a more elaborate model in order to document details of the diagnostic design or establish a baseline that can be used for future analyses.

SYSTEMS DIAGNOSTICS ENGINEERING TOOL CHECKLIST

The Systems Diagnostic Engineering Tool must:

eXpress	Others	
☑	☐	Drive System Design Requirements
☑	☐	Fully support early design influence decision making process based on functionality of the system
☑	☐	Provide a graphical means to efficiently communicate design functionality that describes diagnostic coverage
☑	☐	Provide effective design assessment and produce a requirements Gap Analysis at any phase in development or product use
☑	☐	Capture iterative and evolving data and design knowledge while effectively reporting system or subsystem diagnostic capabilities at any point during development
☑	☐	Integrate all program disciplines such as Reliability, Maintainability, Production, Logistics Support, Test Engineering, Cost Analysis, etc.
☑	☐	Provide true hybrid integration of functional and failure mode analysis
☑	☐	Fully support both common cause (single fault) and Multiple Failure diagnostics
☑	☐	Provide scalable and Open architecture to allow the importing, exporting and exchange of data for rapid design and life cycle data for rapid design and life cycle support of embedded Operational Health Management and Logistics Support
☑	☐	Not be dependent on any industry standard, but can easily adapt to such standard(s)
☑	☐	Be widely used within Industry and Government Agencies
☑	☐	Provide accurate and repeatable analysis results, with high confidence, from solid and proven algorithms backed by world wide industry experience
☑	☐	Supported by a company with a long-standing reputation in industry



Since many complex systems require large, multi-layered breakdowns, a Systems Diagnostics Engineering Tool must be thoroughly scalable, allowing the analyst to efficiently model and analyze extremely large systems, as well as individual units (such as a circuit card or encapsulated device). It must also provide features to ensure consistency and facilitate the integration of models created by many different analysts—either within the same or in different companies or divisions.

Selecting a Systems Diagnostic Engineering tool is much more than comparing outputs. The tool must help you and your customers' satisfy all technical and business case needs within the full Systems Engineering process.

DSI Support Services are there to Help!

Modeling & Simulation

Analysis & Reporting

System Engineering Support

Technical Consultation

Diagnostic Implementation

Mission Assurance / Availability Trade Support

Give us a Call!

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As the leading seller of Diagnostic Software & related Diagnostic Engineering Services, DSI understands the importance of quality service and support. To meet the needs of our customers, we offer a wide array of technical support and service programs developed to address the time-critical issues and stringent diagnostic requirements relevant on many of today's programs. DSI is ready to help with specialized software development, diagnostic modeling and analysis, prognostics and integration with any embedded Run-Time, Integrated Health Management (IVHM, ISHM, IPHM, etc.), advanced mentoring, data management processes and a host of customizable support services to address specific customer needs.

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