# Optimizing SmartPlant Instrumentation Resources

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# Optimizing Manpower Utilization

- Current Engineering and Design industries are faced with a critical manpower shortage

- The manpower shortage has also resulted in a technology gap for experienced Engineers and Designers

- SPI offers a way to reduce man-hours but only when it is used in such a way as to optimize manpower

- The Question "How much time can will SPI save me?" must be answered "None!"

- The Work Processes determine if SPI and other software are being Optimized for Manpower Utilization

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# Optimization Opportunities

## Incorporate new techniques in your Work Practices for better Manpower Utilization

*Automation* saves time by reducing the number of hours it takes to perform a task

*Work Sharing* saves money by reducing the total cost per hour to perform a task

*Specialization* saves time by optimizing the use of skilled specialists to perform complex tasks

*Simplification* saves time by using "out of the box" reports and SPI project deliverables

*Integration* saves time by sharing data and allowing data to move electronically between applications

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# Automation Opportunities

- **SPI can facilitate Automated tasks for both Engineering Construction and Owner Operator companies**

- **SPI can be used as a simple data repository and loop generator or it can be used as an "Automation Tool"**

- **Automation reduces the amount of manual manipulation required to perform given SPI tasks**

- **The degree of Automation in SPI is defined by the Following:**
  - **Work Processes that include Automation**
  - **Users trained to use SPI Automation functions**
  - **Project requirements and schedule**

Export  Foxboro  Browser  Index  Spec Sheets  Wiring  Proc. Data  Calculation  Loop Dwgs.  Hook-Ups  Spare Parts  Calibration  Maintenance  DDP  Spec Binder  Construction  Help

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# Primary Automation Function

◆ **Instrument Type Profile Table**
 – Wiring Presets include Control System Tag Auto-create
 • Panel Name
 • Cable Name
 • Connection Type
 – Specsheet Name
 • Default Data
 • Multi-Item Form
 – Dimensional Data Group
 – Primary Hookup
 – I/O Type
 – Location
 – Loop Creation and Process Data Workflow



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- **New Tag Instrument Type Profile Data expansion**

- **Duplicating data from Tag to Tag or Loop to Loop**

- **Batch creation of Loops from Loop Patterns**

- **Browse Automation**

  - **Spec Sheet generate from Profile**
  - **Process data generate from Profile**
  - **Control Systems Tag Create**
  - **Device Wiring Create**
  - **Report Generation from View**
  - **Copy and Paste Buffer**



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# Spec Sheet Automation Functions

**Associate an External Title Box to Spec Sheets**

**New Tag Spec Sheet Profile Data expansion**

**Create and Copy from Template data**

**Batch Report Generation**

**Batch save as Excel**

**Global Revisions**

# Process Automation Functions

- **New Tag Profile Process Data expansion**

- **Propagation of data from Lines or other Tags**

- **Unit Conversion**

- **Global Revisions**

- **Data Exchange**
  - Spec Sheets
  - Calculations
  - External Editor
  - Legacy Systems
  - Simulators

- **Base Conditions**



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◆ **Automatic results population of Spec Sheets**

◆ **Batch Calculations for CV, PSV, FE and TW**

◆ **Unit Conversion**

◆ **Global Revisions**

◆ **Data Exchange**
 – Spec Sheets
 – Process



**Body Type**

| | | | |
|---|---|---|---|
| Calculation method: | ISA | | |
| Flow coefficient: | Cv | | |
| Noise calculation method: | Masoneilan | | |
| Body type: | Single Seat Globe | | |

| | @Minimum | @Normal | @Maximum |
|---|---|---|---|
| Critical flow factor ( Fl, Cf ): | 0.86 | 0.86 | 0.86 |
| Pressure drop ratio factor ( Xt ): | 0.6213 | 0.6213 | 0.6213 |

☑ Calculate pressure drop ratio factor

| | | |
|---|---|---|
| Valve style modifier ( Fd ): | 1 | |
| Relative capacity ( Cv/d² ): | 12.3 | |
| Number of flow passages: | 1 | |
| Valve size: | 2 | in |
| Outlet pipe diameter: | 3.826 | in |

OK    Cancel    Help

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# Wiring Automation Functions

- **Use Default Panels and Cables**

- **Duplicate Panels and Cables**

- **Auto-Wiring Routing Utility**

- **Junction Box Pre-assignment**

- **Automatic Cross Wiring**

- **Cable Router and Spooler**

- **Automatic Cable Schedule**

- **Global Revisions**

# Document Automation Functions
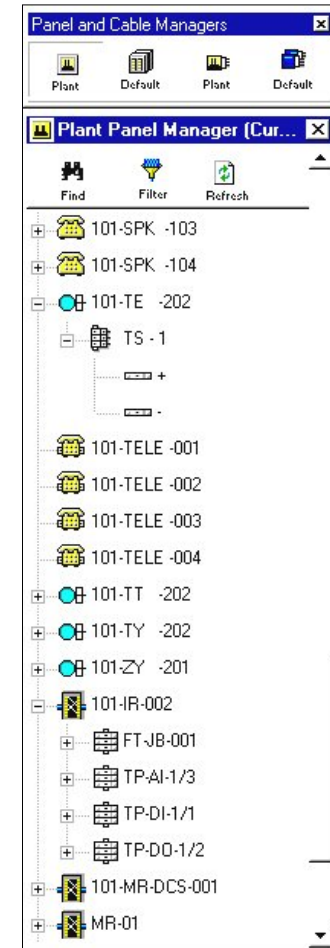
- **Automatic Report forms for all browse Views**

- **Global Revisions for Deliverable Documents**

- **Batch Printing of most common reports**

- **Enhanced Reports for Loops and Wiring Drawings**

- **All Reports Export ODBC or DXF**

- **Automatic Drawing Generation in:**
  - **Enhanced SmartLoop**
  - **AutoCAD**
  - **Microstation**

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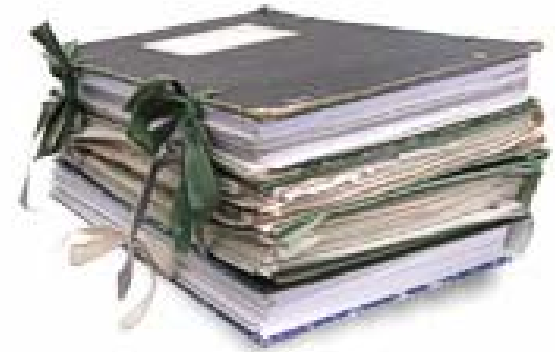
# Sequence of Automation

- **Educate** users for the Automation Function you wish to use

- **Prepare** the rule base or trigger data before launching the Automation Function

- **Test** the Automation Function to see if you are getting expected results

- **Launch** the Automation Function on the complete task

- **Check** the results of the Automation Function carefully

EDUCATE → PREPARE → TEST → LAUNCH → CHECK

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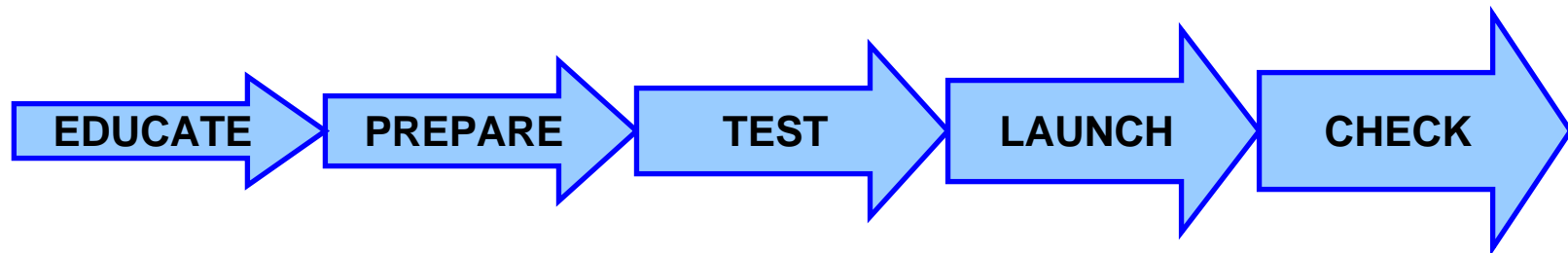
# Do Not Misuse Automation

- **Match the tool to the task.  Select the Automation Function carefully.**

- **Clean bad data from the rule base or bad trigger data from the database.**

- **Validate data before and after running an Automated Function.**

- **Don't try and do too much with one Automated Function.**

- **Know the limits of automation and do not try to do complex tasks with Automated Functions**

If the only tool you know how to use is a hammer; everything look like a nail.

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# Work Sharing Opportunities

## Improved Work Sharing will increase efficiency and productivity

- **High Value Resources**
  - **Extending SPI access to low cost centers using terminal server technology can reduce need for some expensive local manpower**

- **Around to clock operations**
  - **Global Work Sharing allows 24-7 utilization of hardware and software resources**

- **Extend utilization of SPI experts**
  - **Allow experts to access SPI in from different locations to optimize highly trained talent**

- **Bring more resources to a project**
  - **Involve Vendors and Service companies in your work processes with Work Sharing**

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# Work Sharing High Value Resources

- ◆ **High Value Work Centers**

- ◆ **Main Automation Contractors**

- ◆ **Clients access for approval cycle**

- ◆ **Expert Resources for specialized tasks**

- ◆ **Support Centers for technical assistance**

- ◆ **Equipment Vendors for sizing and selection**

- ◆ **Spread Projects across multiple EPC companies**

- ◆ **Collaboration across disciplines and departments**

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# Work Sharing Around the Clock

- ◆ **Operations extend to 24 hours a day**

- ◆ **Better hardware utilization**

- ◆ **Better use of  Licenses**

- ◆ **Shorten Schedules**

- ◆ **Faster Response**

- ◆ **Offset Overtime**

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# Work Sharing with Experts

- **Allow your Specialized Users to work across several projects**

- **Use Vendor Experts**

- **Share Super Users**

- **Hosting Services**

- **MAC Options**

- **Integrators**

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- **WEB Terminal Server Technology**

- **Connect using WAN & LAN**

- **SmartPlant Foundation**

- **Use Remote Access**

- **Import / Export**

- **SPI Modules**

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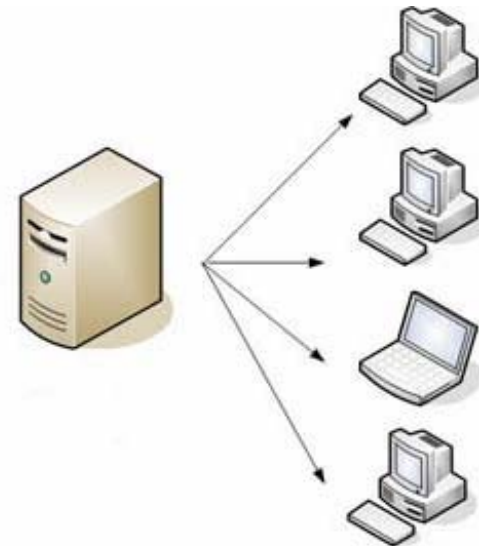
# Specialization Opportunities

**Using Specialized Users can improve SPI data quality and increase productivity**

- ◆ **Creating Specialists - Train selected users in specialized tasks to allow them to be knowledge resources**

- ◆ **Existing Specialists - Collaborate with existing experts using net meetings and forums better utilize their abilities**

- ◆ **Outside Specialists - Use outside experts from vendors or service companies to fill gaps in resources**

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# Make Your Own Specialists

- ◆ **Create SPI Administration Specialists for configuring and implementing SPI**

- ◆ **Create SPI Specialists to train and support other SPI users**

- ◆ **Create Specialists for SPI modules and tasks that are not day to day activities**

- ◆ **Create SPI Specialists for tasks that are Complex or Require special knowledge**

- ◆ **Create Specialists to use Interfaces with Legacy Systems or External Applications**

- ◆ **Create IT Specialists that are familiar with installing and operating SPI, Oracle, MS SQL, Citrix**

- ◆ **Create Specialists for other SmartPlant Application interfaces and work processes**

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# Using Existing Specialists

◆ **Within most companies you have people who have particular talents that can be applied to SPI related tasks**

- Users with Excel or Access knowledge can assist with custom reports and deliverables
- Specialty Engineers that work with only Control Valves or other Engineered items can use SPI directly to do their engineering
- Process Engineers can use SPI to enter their process data directly into the SPI database for Control System
- Material Managers can use the SPI Hookup module to control instrument material requirements and do Material Takeoffs
- 3D PDS Designers can use the SPI DDP module to facilitate the loading of instrument inline data into the 3D model
- Project Schedulers can access the SPI database to define work packages and cost systems to track progress

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# Using Outside SPI Specialist

- **Using external resources can fill gaps in in-house capabilities**
  - Use vendor or suppliers to do sizing calculations and selection of engineering commodities
  - Use Main Automation Contractors to specify, load, configure the DCS and SIS control systems
  - Use Mechanical Equipment Vendors to populate instrument spec sheets for instruments provided with their equipment
  - Use Owner Operator representatives to assist in populating Operations and Maintenance data in the SPI database
  - Use external IT suppliers to host and maintain the SPI Oracle, MS SQL and Citrix servers
  - Use Intergraph or OSI to provide merging and data migration services

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# Simplification Opportunities

## Streamlining your work methods can give better utilization of SPI resources

- **Data Reduction** – Careful evaluation of required data can reduce size and content of SPI database

- **Streamline Deliverables** – The generation of deliverables can be very time consuming and inefficient

- **Simplify Work Processes** – Work Process need to address the capabilities of the tool to be effective

- **Minimize Staffing** – Efficient use of personnel can optimize the use of SPI

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# Simplify Data Reduction

- **Do not fill all data fields in all tables**
  - Use only required data
  - Simplify the content of fields
  - Don't use "--" or "n/a" to show empty data fields
  - Give meaning to data (don't use "Yes" / "No" data

- **Do not repeat data from one table in another**

- **Do not create complex or lengthy naming conventions**

- **Keep User Defined fields and tables to a minimum**



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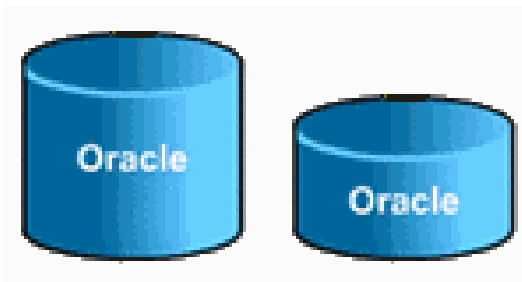
# Simplify Deliverables

- **Use electronic deliverables instead of paper**
  - **Spreadsheets instead of printed indexes**
  - **ODBC files can replace most paper documents**
  - **Acrobat PDF files can replace paper Spec sheets**

- **Use SPI "Out of the Box" reports**
  - **Don't create custom reports to emulate existing documents**

- **Use Enhanced Loops instead of CAD loops**

- **Don't try to create complex loops in SPI**

- **Allow construction and client access to database so they can generate their own documents**

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# Simplify Work Processes

- ◆ **Don't try to use manual work processes with SPI**

- ◆ **Include other disciplines in your SPI work processes**

- ◆ **Look at how SPI operates to develop effective Work Processes**
  - – **Use the proper module to load and edit data specific to that module**
  - – **Leave data in it's parent table for reports and deliverables**
  - – **Provide for Parallel work processes instead of Sequential schedule driven work processes**
  - – **Make Automation part of the work process!**

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# Simplify SPI Staffing

- **Use of Super Users can reduce the required number of inexperienced personnel**

- **Work Share the SPI user base across multiple offices for minimal staffing costs and numbers**

- **Use SPI Automation functions for mass loading of data and redundant tasks**

- **Allow SPI Specialists to work across several projects to optimize their abilities**

- **Rely on external SPI Experts to offset reduced staffing levels**

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# Integration Opportunities

## Integrating SPI to other applications will extend the capabilities of the tool

- **SmartPlant Foundation** – Integration with SPF can optimize the utilization of SPI data across other Intergraph products

- **Vendor Applications** – Integration to vendor control valve sizing and DCS configuration software will maximize the SPI data

- **External Editor** – Using the SPI External Editor can allow mechanical vendors load some of your Spec data for you

- **PDS 3D model database** – The SPI DDP module will integrate the SPI inline sizing data with the 3D model

- **SmartPlant P&ID and Electrical** – The built-in SP P&ID and SPEL interfaces allow data transfer if your work processes are designed to utilize the shared data

- **Import Export** – The ability to import and export data to and from other applications will extend your Integration capabilities

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# ASCII stupid question

# Get a stupid ANSI