

SmartPlant Instrumentation Technical User Forum P2C2 (Houston SPI TUF) Meeting		May 15, 2012 8:00 am Jacobs Engineering
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Attendees	41 Members in attendance 8 Online	Copied To	Houston SPI LTUF Website
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Called By	John Dressel	Prepared By	John Dressel with notes by Betty Alexander
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Item	Topic	Notes	Action/Due
1	Welcome to Jacobs Engineering	<ul style="list-style-type: none"> • John Bolmanski, Jacobs • John welcomed everyone to Jacobs and gave a safety moment. • Suggested members visit a Trailer parked between the buildings to see the "Scene of the Accident" (a wrecked car showing extensive damage) 	
2	Chairman's Notes	<ul style="list-style-type: none"> • Up Coming Events: Next Houston SPI O/O Meeting – Telecom Tuesday, May 23, 2012 10:00 AM - 12:00 PM CST Fred Pollard, CoSyn, pollard.fred@syncrude.com, PP&M Global TUF Meeting Sunday, June 3, 2012 8:00 AM – 4:00 PM MGM Grand Hotel and Casino – Room 313 Intergraph @ HEXAGON 2012 June 4-7, 2012 MGM Grand Hotel and Casino 	
3	Introductions	<ul style="list-style-type: none"> • All attendees Introduced themselves 	
4	Minutes	<ul style="list-style-type: none"> • Minutes of 2011-11-08 meeting approved 	

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5	Presentation	<p>OPTIMIZING THE SMARTPLANT INSTRUMENTATION V2009 IMPORT MODULE</p> <p>Nezar Faitouri, Mangan Technical Consultant</p> <p>Introduction</p> <ul style="list-style-type: none"> • The SPI import utility provides a faster way to implement SPI data (loops, tags, specs, etc) from external source files such as Microsoft Excel. • The purpose of this presentation is to give the SPI user a small/starting guideline document for the SPI Import utility, tips and tricks, issues, etc. • This presentation is not intending to be a training document and can't be used by first time SPI import users. • It is strongly recommended for first time import users: <ul style="list-style-type: none"> • To attend the SPI import classes provided by Intergraph and Overload Services, Inc. • To seek consulting services regarding the SPI import utility. • It is strongly recommended to have a SPI database backup before importing. • It is strongly recommended that only SPI users that understands SPI tables to perform SPI imports, just in case for unexpected issues and troubleshooting purposes. <p>SPI Import Source Files</p> <ul style="list-style-type: none"> • Source Files <ul style="list-style-type: none"> ○ There are several types of source files: <ul style="list-style-type: none"> ▪ Microsoft Excel, Microsoft Access, and CSV. ▪ Text. ▪ Dbase. ▪ Note: All source files for SPI import utility must be in a flat file format (header and data). • SPI Import Utility and Microsoft Excel <ul style="list-style-type: none"> ○ In my experience, the most successful source file for SPI imports is Microsoft Excel <ul style="list-style-type: none"> ▪ Easy data manipulation and clean up. ▪ Easy data validation. ▪ Using the ASAP utility, it makes it a very powerful tool for batch editing and validation of data. ▪ Using macros and functions. ○ In your source file, it is strongly recommended to always: <ul style="list-style-type: none"> ▪ Cleanup the UOM's, flags, and codes to match SPI database requirements such as "US gal/min vs. GPM". ▪ For the UOM's, match the SPI UOM code names (SPI – Tools – Unit of Measures and 	

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		<p>Codes). If customized, then match the customization.</p> <ul style="list-style-type: none"> ▪ Cleanup the loop and tag naming conventions to match SPI naming convention structure. ▪ Cleanup the supporting table information to match SPI database requirements such as instrument types, I/O types, wire colors, etc. <p>○ It was reported by some SPI users that sometimes, the Excel file data does not import successfully. This is because the Excel file data format must be Text format (highlight data – right click – format – text); however, even doing this does not work 100%. To eliminate the issue, do the following:</p> <ul style="list-style-type: none"> ▪ In your excel source file, add a second row with the letter “a” across your data fields. ▪ Save the file. Open Microsoft Access and import the Excel file into access. The “a” row ensures that all data imported to access is in a text format. Double check this by opening the imported table in the design view mode. ▪ Export the file to Microsoft Excel format. The file name used will be the Excel file name range that the SPI import utility uses. It is strongly recommended that the name ranges are always UNIQUE. ▪ If the same name range is used twice for 2 different excel files (none unique name range), the first Excel file is linked to the SPI import utility successfully; however, the SPI import utility will map the first file again even if you pointed to the second file. ▪ Now, the file is ready to be used with the SPI import utility. Remember to Delete the “a” row from the source file before importing. <p>General Import Optimization</p> <ul style="list-style-type: none"> • SPI Fields to map: <ul style="list-style-type: none"> ○ Merge_Release_flg: This is the owner Operator database flag that is used with the admin option to keep a view only copy of a project after a Merge. Always in any import link, if the field is available, set this flag to ‘N’. If not set, project records will not merge into As-built. ○ ○ Def_flg: This is the wiring flag that separates the project and reference wiring data. If project wiring data, set the flag to ‘N’. If reference wiring data, set the flag to ‘Y’. ○ 	

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		<ul style="list-style-type: none"> ○ Process Data Cases: This field applies to process data tables (pd_general, flow, analyzer, etc) and spec sheet tables (spec_sheet_data, add_spec1, etc). It is the primary key for these tables along with the tag number. ● If the data imported does not include case data, the default mapping for Oracle and Watcom "Source Name" is (") ● If the data imported does not include case data, the default mapping for MS-SQL will be as follows: ● The MS-SQL default case name is *; however, the import utility does not recognize the * if mapped as '* ● The workaround is to update the * (update process_condition set case_name = 'XXX' where case_id = 0). The XXX could be anything, the XXX is just an example. ● In the import link, set the case name to 'XXX'. ● Once the import is complete, update the default case name to the original value (update process_condition set case_name = '* where case_id = 0). ● If the imported data do have case information, then the case name must be part of the excel source file. ● SPI V2009 SP2 and lower, the cases must be enabled in SPI first to import the data; otherwise, the data will be rejected. ● For V2009 SP3, the cases do not need to be enabled in SPI first as the import can import the cases as new records. ● SPI Import Link Table Definitions <ul style="list-style-type: none"> ○ It is never recommended to modify the import Table Definition on your own. Always, contact Intergraph for help. These are the primary, foreign keys, and table relation. If modified without Intergraph help, the risk is very high in corrupting the database. ○ There are several table definitions that Intergraph developed that can be used such as Line Process Data table import, Wiring imports especially for Wiring Equipments, Channels, Strips, etc. ● SPI Import System Source Codes <ul style="list-style-type: none"> ○ The system source code provides the capability of mapping source file data that does not match SPI codes. Ex: US gal/min vs. GPM. ○ The System code can be used and applied to UOM's and Other SPI codes. ○ Basically, the idea here is not to clean the excel source file to match the SPI requirements, instead, the user uses the source system function to translate the source file data to SPI UOM's and codes. ○ In order for this function to work, the user must check the box to Use system Codes under the link property window. ○ <u>Personally</u>, I do not recommend using this function as we experienced issues with it in the past such as some of the ones defined do not show up in the import link 	

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		<p>even if the check box is checked to use it. As usual, always clean the source file.</p> <ul style="list-style-type: none"> • SPI Import links from another SPI database <ul style="list-style-type: none"> ○ It is possible to import links from other SPI databases as long as the SPI versions are matching. If the versions are not matching, there is a possibility it will work; however, it may not work due to table changes, etc. ○ When importing links, it is always recommended to Create a New Duplicate table definition names just in case that the default table definitions were modified in the source database. • SPI Import Comparison Option <ul style="list-style-type: none"> ○ The comparison option can only be used with table imports. ○ It is extremely helpful especially when comparing supporting tables such as the instrument types table. It will list inserted, updated, deleted, and refreshed (no change). • SPI Import Tag/Loop Definition <ul style="list-style-type: none"> ○ Always Define the naming convention in the link. This means loop and tags will be cleaned in the source file. ○ Always recommended to check the validate tag and loop segment. If unchecked, the import will not validate consistency between tag instrument type and the table, and Loop measured variable and the table. <p>Optimizing Instrument Index Import</p> <ul style="list-style-type: none"> • Excel Source File <ul style="list-style-type: none"> ○ Recommended as minimum data: <ul style="list-style-type: none"> ▪ Tag Number, Instrument Type, Instrument Type Desc., Process Function, and Tag Category ID. ▪ If importing to multiple units, then include the Plant Name, Area Name, and Unit Name or Unit No. ▪ If the Tag Number has a loop, then include the Loop Name and the Loop Measure Variable. ▪ If the Tag Category ID is not included, all tags will be imported as Conventional Tags. ▪ Always recommended to match between the tag instrument type and its table, and loop measured variable and its table. ▪ Ex: Tag: 101-FE-1000; therefore, instrument type in source file is FE. ▪ If the loop service and tag service are provided in the source file; therefore, a column in the source file called Apply Service must be added. The data will be: 	

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		<ul style="list-style-type: none"> • Y if the loop service description will match the tag service description. • N if the loop service description does not match the tag service description. ▪ The same applies to loop equipment and loop P&ID vs. tag equipment and tag P&ID. Two additional columns called Apply Equipment and Apply P&ID. The mapping will be to the loop section of the import. ▪ If this is not set, the default when importing new loops is Y to all three fields; therefore, the loop service, loop P&ID, and loop equipment will overwrite the tag info regardless of the source file data. ▪ Never have a model number without a manufacturer name. The SPI import utility allows imports models without manufacturers :- (• Import Utility <ul style="list-style-type: none"> ○ Link Properties <ul style="list-style-type: none"> ▪ Either use the Instrument Index Module Import or the Table imports. ▪ If tables imports are used, several links must be created for the different imported data (instrument types, instrument location, P&ID, Equipment, loop, component, etc). Always remember the SPI table hierarchy when create the table import order. Ex: Import P&ID's first and then loops and tags. ▪ If the module import is used, several links must be created; however, not as much as table imports. Ex: Instrument Certification is not part of the module import; therefore, a table import needs to be done for the instrument certification, and then the index module import. ▪ For an index module import, always check the box for display all fields. This will show additional SPI fields to map to. ▪ Always leave the creation of complimentary data unchecked. There are several issues reported and experiences in previous SPI versions. Always generate this data from within SPI once the import is complete. ▪ Always activate the Import Level if importing to multiple units. ▪ In addition, you can import to multiple As-Built projects if needed. ○ Hidden codes/flags and issues <ul style="list-style-type: none"> ▪ In previous versions, there are several codes and flags that were reports to cause issues if 	

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		<p>not mapped, some of them are resolved in the new versions, and some are fixed once checkdb is executed. These codes and flags should only apply to new loops and tags imported. These codes and flags are:</p> <ul style="list-style-type: none"> ▪ There are other flags that caused issues in previous versions; however, they are fixed in V2009 either by the import itself or checkdb. <p>Optimizing Process Data Import</p> <ul style="list-style-type: none"> • Excel Source File <ul style="list-style-type: none"> ○ Recommended as minimum data: <ul style="list-style-type: none"> ▪ Tag Number, fluid state (pd_fluid_phase), and case name. ▪ I added the SPI field name (pd_fluid_phase) because the fluid state and fluid phase SPI fields are swapped. The fluid phase SPI field is pd_fluid_state. ▪ Remember, if all tags do not have the process data cases activated, then use the options motioned in the section of SPI Field mapping for process data cases. ▪ If importing to multiple units, then include the Plant Name, Area Name, and Unit Name or Unit No. ▪ If the tag instrument type is different than the instrument type table, the import will reject the records. Always recommended to have the tag instrument type and its table matching. • Import Utility <ul style="list-style-type: none"> ○ Link Properties <ul style="list-style-type: none"> ▪ Either use the process data Modules Import or the Table imports (pd_general, flow, temperature, etc). ▪ Always create the process data sheet to create the SPI ▪ drawing/report record for manual or imported revision. ▪ Fluid State flags are: <ul style="list-style-type: none"> • Fluid State Flag <ul style="list-style-type: none"> ○ Liquid "L" ○ Gas/Vapor "G" ○ Steam "S" ○ Water "W" ○ Solid/Powder "P" ○ N/A or Other "O" ○ Hidden codes/flags and issues 	

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		<ul style="list-style-type: none"> ▪ There is only one (pd_line_eq_flg). L means tag is assigned to Line in process data module, and E means tag is assigned to Equipment in the process data module. If not set, the line size information will not show in the process data report. ▪ Remember, it is always recommended to have the UOM codes, and flags cleaned in the source file. <p>Optimizing Specification Data Import</p> <ul style="list-style-type: none"> ○ Excel Source File <ul style="list-style-type: none"> ▪ Recommended as minimum data: ▪ Tag Number, spec form number (if table import), and case name. ▪ Remember, if all tags do not have the process data cases activated, then use the options motioned in the section of SPI Field mapping for process data cases. ▪ If importing to multiple units, then include the Plant Name, Area Name, and Unit Name or Unit No. ▪ If the tag instrument type is different than the instrument type table, the import will reject the records. Always recommended to have the tag instrument type and its table matching. ▪ If importing by spec forms and specs are not normalized, always split the source files by the forms for easy data cleanup and mapping. ▪ Always match the spec form drop down list codes and not the full data description. ○ Import Utility <ul style="list-style-type: none"> ▪ Link Properties <ul style="list-style-type: none"> • Either use the Specification Modules Import (by form) or the Table imports (spec_sheet_data, add_spec1, etc). • Always create the process data sheet to create the SPI drawing/report record for manual or imported revision. ○ Hidden codes/flags and issues <ul style="list-style-type: none"> ▪ None. <p>Optimizing Wiring Data Import</p> <ul style="list-style-type: none"> • Excel Source File <ul style="list-style-type: none"> ○ All wiring items must have a unique name for a successful import (panels, strips within the same panel, racks within the same panels, slots within the same rack, and wiring equipments within the same panel or 	

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		<p>the same racks, or the same slots, cables, and cable sets within the same cable).</p> <ul style="list-style-type: none"> ○ The import does not use the sequence as the uniqueness, it uses the item name. Only terminals and wires imports uses the sequence. ○ The source file needed and the order of the wiring import for conventional wiring is as follows: <ul style="list-style-type: none"> ▪ Supporting tables (panel manufacture, model, terminal types, cable colors, etc). ▪ Panel table – cabinet_rack (racks) table – rack_position table (slots) – apparatus (wiring equipments) – panel_strip (strips) – channel – panel_strip_term (terminals). ▪ Cable table – cable_set table (pairs, triads, etc) – wire table. ▪ Panel_component table (this is to link the tags to the device panels). ▪ Control_system_tag (this is to link and import tags with the CS tags). ▪ General_signal (this is to link and import general signals to tags). ▪ Wire_group (this is to link the tags with the signals). ▪ Wire_terminal (this is to create the wiring connections). ○ Make sure that the item sequence numbers are unique (strips within a panel, rack within the panel, slots within a rack, etc). If not, the import will rejected the records where sequence is not unique. ○ Make sure to include the apparatus category name to the wiring equipment source file (I/O Card, I/O Termination, Relay, etc). In addition, the source files must be split depending on the wiring equipment import structure (panel – rack – slot – wiring equipment) or (panel – rack – wiring equipment) or (panel – wiring equipment), etc. ○ Make sure to split the channel source file depending on the channel import structure (panel – strip – channel) or (panel – strip – channel), etc. ○ Make sure to split the strip source file depending on the strip import structure (panel – strip) or (panel – wiring equipment – strip), etc. In addition, when importing I/O strips, make sure to provide the I/O type of the I/O strip. ○ The source file split is done because the primary key's will be different from one import to another. Example: if importing an I/O strip, the wiring equipment name must be included in the source file (panel – wiring equipment – strip).; however, if the source file included non I/O strips and the wiring equipment name is blank, the import will reject the records with blank wiring equipment names. 	

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		<ul style="list-style-type: none"> ○ This is why, there are several target table definitions that are defined by Intergraph to use for such imports. <p>I/O Assignment Import</p> <ul style="list-style-type: none"> ● SPI I/O Assignment <ul style="list-style-type: none"> ○ When performing a SPI I/O assignment manually, SPI populates the control_system_tag table and the wire_group table. The control_system_tag table to create the I/O assignment and the wire_group table to create the tag signal. ● Import I/O Assignment <ul style="list-style-type: none"> ○ Unfortunately, when running an import for the I/O assignment, (control_system_tag), the import utility does NOT create the necessary records in the wire_group table; therefore, another import must be executed to update the wire_group table. <ul style="list-style-type: none"> ▪ Control_system_tag table import minimum fields are (cs tag name, tag name, panel name, strip name, and channel number). ▪ Wire_group table import minimum fields are (group_name, tag name, panel name, strip name, channel number, and wire_group_category_id). The group name = tag name. ▪ Wire_group_category_id = 0 for instrument tags. <p>Notes:</p> <p>Purchase ASAP Utility to clean-up the source file Most folk STRUGGLE with the Import Module. Basic Guideline ... slides provided online later. SPI Import Module is a BEAST. Flat file SOURCE. MS EXCEL is cleanest per Nezar. File Cleaning via online utility ASAP</p> <p>Special note to changing to TEXT format. Use Access per slide. Owner/Operator mode will NEED Merge release flag = 'N'</p> <p>Special for MS SQL – Case Name for process data Imports. Link Property Window box Checked to use System Codes.</p> <p>When transferring Links to 'other' projects ... The Default target definition may be over written if you do not Create a New One. Import Comparison ONLY works for Tables, not Modules.</p> <p>Tag Category ID helps differentiate between Conventional and FFB tag imports</p> <p>Recommendation to always import Tags with Instrument Types even if SPI allows otherwise</p> <p>Flag for Service Description NOT matching Loop description Process Data & Specification Data Mapping Notes.</p>	

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		<p>WIRING DATE: Sequence in Panels/Strips etc started in SPI7 ... now – Sequences Must be Unique</p> <p>Names of Strips, Racks, etc must be Unique names ... also for cables, cable sets. (otherwise Importing will over-write.</p> <p>Cannot import I/O cards, IOTA, etc within One Source File ... same for Panel-Strip vs DCS Panel (with wiring equipment)</p> <p>IMPORT I/O type must be assigned at the panel_strip level. This is a bug with SPI TR-PB-129899</p> <p>When doing I/O Assignment via IMPORT it Acts DIFFERENT than User GUI (Import does Not assigne to CStag AND WireGroup Table.) Slide fixes this. (otherwise device panel Report)</p> <p>Clean up Units to match SPI</p> <p>Flags – need to match exactly; absolute (A), gauge (G) The fields have to be text files.</p> <p>Add a new row “a” for the excel file so when importing the file to access, all file is set to TEXT automatically</p> <p>Merge_Release_Flg – “N”</p> <p>Cases will not import before SPI2009, SP3</p> <p>Need to have tag Category ID defined when you have Foundation or Conventional Tag</p> <p>Checking the complimentary data will slow down import Run CheckDb after Import</p> <p>Wiring Data Import</p> <p>Ver 7 to current – Wiring items must be unique including strips and panel (terminal, wire and cables excluded)</p> <p>Fluor exports data and then imports data back in the Import Module</p>	
6	Presentation	<p>SMARTPLANT FOUNDATION at FLUOR John Dressel, Fluor</p> <ul style="list-style-type: none"> • Fluor’s Investment in the “NEXTGENERATIONsm Initiative” • Fluor’s Global Certified Environment • Fluor’s Execution & Work Processes • Fluor’s NEXTGENERATIONsm Training Programs • Fluor’s Global Deployment / Office Readiness Program • Fluor’s Global Sustaining Organization • Fluor’s Implementation of SP-P&ID Integration 	

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		<ul style="list-style-type: none"> • Fluor's Implementation of SPI Integration • Fluor's Implementation of SPEL Integration • Fluor's Implementation of SP3D Integration • Fluor's Legacy Integration Programs • Fluor's SmartPlant 3D Design Reuse Tools • Fluor's NEXTGENERATIONsm "THINKING FORWARD" <ul style="list-style-type: none"> ○ SmartPlant P&ID Data Validation and Editor ○ SmartPlant Instrumentation Data Integration ○ SmartPlant Electrical Cable Management Tools • Fluor's Investment in the "NEXTGENERATIONsm Initiative" <ul style="list-style-type: none"> ○ Work Process Review; began mid 2004 ○ Technology Evaluation; 2005 – 2006 ○ Certified Environment Development & Pilot Projects; 2007 – 2009 ○ Office Readiness, Training & Deployment; 2010 – 2011 ○ Global Project Execution Directive; 2012 • Mission Statement: <ul style="list-style-type: none"> ○ Fluor's investment supporting the NEXTGENERATIONsm Initiative is a proactive approach to successfully deploy the Intergraph SmartPlant Suite of technologies within Fluor in advance of production projects; <ul style="list-style-type: none"> ▪ Implementation of the SmartPlant software suite and SmartPlant Foundation in an Integrated project execution environment ▪ Work processes and Organizational changes that position Fluor for a "Next Generation" of project execution • Fluor "Global Certified – Production Ready" Environment <ul style="list-style-type: none"> ○ Integrated Project Execution Environment with a Defined Set of Automation Tools & Compatible Versions ○ Implementation of Intergraph SmartPlant Enterprise Suite with "Certified - Production Ready" Environment ○ Fluor Utilities, Reporting, Drawing Templates, Catalog / Reference Data, Automation / Rules - with supporting Execution Guidelines, Work Processes, Training Program. & Deployment Program ○ Benefits - Global Execution Consistency, Cost Effective and Streamlined Project Start-up, Reduce Risk to Projects by "Pro-Actively" Testing & Certifying Automation Tools • Global Work Process Driven Execution ... <ul style="list-style-type: none"> ○ Development of SmartPlant Global Execution Work Processes and Procedures 	

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		<ul style="list-style-type: none"> <ul style="list-style-type: none"> ▪ NEXTGENERATIONsm Execution Guidelines (Volumes 1,2, & 3) ○ Integrated Execution Work Processes using SmartPlant Foundation <ul style="list-style-type: none"> ▪ Data Consistency, Centralized Integration Layer via SmartPlant Foundation ○ Multi-Functional Design Work Processes <ul style="list-style-type: none"> ▪ Design Reuse; eliminate re-modeling and re-building between functions and projects ○ Material Management, Weight & COG Management, SmartPlant Interfaces (external & internal) <ul style="list-style-type: none"> ▪ Material Management, MTO Extraction Utilities (Material Download Utility), Weight & COG Management Processes, Systems & Tool Interfaces, etc. • Work Processes by SmartPlant Application ... <ul style="list-style-type: none"> ○ Cross Discipline SmartPlant 3D Work Processes ○ SmartPlant P&ID Process Graphics Work Processes ○ SmartPlant Instrumentation Integration Practice ○ SmartPlant Electrical Implementation Practice • Fluor's NEXTGENERATIONsm Training • Role Base Curriculums <ul style="list-style-type: none"> ○ Leveraging the "Full" Advantage SP3D User Friendly Interface - Enabling "Multi Function Design" • On-line SmartPlant 3D Virtual Training <ul style="list-style-type: none"> ○ High Quality, Effective, and Flexible Delivery ○ Enabled Fluor to Train Designers in Advance of Production Projects . • Fluor Work Process Training <ul style="list-style-type: none"> ○ Re-enforcing Fluor's Work Processes Described in NEXTGENERATION Guidelines • Office Readiness - "On-site" Coaching <ul style="list-style-type: none"> ○ Coaching of "Key" Subject Matter Experts ○ Leverage "existing" SmartPlant tool Experienced Resources ○ SmartPlant 3D Subject Matter Experts ○ SmartPlant P&ID Subject Matter Experts ○ SmartPlant Instrumentation Subject Matter Experts ○ SmartPlant Electrical Subject Matter Experts ○ Establish SmartPlant Foundation Experts in all Fluor Offices • Fluor's Global NEXTGENERATIONsm Deployment / Office Readiness Program <ul style="list-style-type: none"> ○ Phase 1 <ul style="list-style-type: none"> ▪ IT Infrastructure 	

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		<ul style="list-style-type: none"> ▪ Subject Matter Expert Identification ▪ Develop Project Deployment Plan ▪ Training Environment Setup ▪ Office Readiness Checklist ○ Phase 2 <ul style="list-style-type: none"> ▪ "On-site" Coaching by Core Team ▪ "Train the Trainer" Program ▪ Project Environment Setup & Configuration ▪ Initiate "Project Task Force" Training Program ○ Phase 3 <ul style="list-style-type: none"> ▪ "On-site" Project Start-up Coaching by Core Team ▪ Begin Project Execution ▪ Office Subject Matter Experts - "point of contact" for project / office & as part of Fluor Global Sustaining Organization • Fluor's SmartPlant - Global Sustaining Organization <ul style="list-style-type: none"> ○ Global Core Team ○ Regional Support Teams ○ Office Support Teams • Global Change Management Governance Process <ul style="list-style-type: none"> ○ Certified Environment Change Request Process ○ Governance Process; Evaluation, Resources, Design, & Implement • Build a Community of Subject Matter Experts <ul style="list-style-type: none"> ○ Establish Subject Matter Experts thru Office Readiness Program ○ Global Subject Matter Expert Telecoms & Forums ○ Leverage Fluor's Knowledge On-Line • Fluor's Global NEXTGENERATIONsm Project Execution Directive: <p style="margin-left: 40px;">"All Fluor Projects worldwide shall be implemented using the SmartPlant software suite and SmartPlant Foundation in an Integrated project execution environment"</p> • Implementation of SP-P&ID Integration <ul style="list-style-type: none"> ○ SmartPlant P&ID "Publish" P&ID Diagram Numbers, Instrument Numbers, Line Numbers, Equipment Numbers and Associated Data to SmartPlant Foundation ○ Other SmartPlant tools "Retrieve" the P&ID Data from the SmartPlant Foundation 	

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		<ul style="list-style-type: none"> • Implementation of SPI Integration <ul style="list-style-type: none"> ○ SmartPlant Instrumentation correlates Instrument tag Numbers with SP-P&ID for MOC ○ Instrument Power requirements and Signal cross reference is Published to SPEL ○ Dimensional Data for Piping and Inline Instrument tags are published to SP-3D • Implementation of SPEL Integration <ul style="list-style-type: none"> ○ SmartPlant Electrical Retrieves Instrument Power Requirements and Signals from SPI and Electrical Equipment Numbers from SP-P&ID and Tray Data from SP-3D ○ SmartPlant Electrical Publishes Cables requirements to SP-3D and Instrument circuiting with Electrical Signals to SPI • Implementation of SP-3D Integration <ul style="list-style-type: none"> ○ SmartPlant 3D Retrieves Equipment and Line Numbers from SP-P&ID – Dimensional Data for In-lines from SPI – Cable Data from SPEL ○ SmartPlant 3D Publishes 2D Location drawings and Model Material Requirements for Cable and Cable Tray System to SPEL • Fluor’s Legacy Integration Programs <ul style="list-style-type: none"> ○ Fluor Feed Database (FFD) <ul style="list-style-type: none"> ▪ Acquires data from Smart P&ID and Process Simulators and inputs Mechanical, Process and Line data into SmartPlant Instrumentation and SmartPlant 3D ○ Fluor Material Manager (MatMan) <ul style="list-style-type: none"> ▪ Retrieves Material Requirements from SmartPlant Instrumentation, SmartPlant 3D and SmartPlant Electrical and Produces Purchase Orders, Bills of Material and Field Material Control & Warehousing Reports • Fluor’s SmartPlant 3D Design Reuse Tools <ul style="list-style-type: none"> ○ Fluor “Global” SmartPlant 3D Drawing Templates <ul style="list-style-type: none"> ▪ Piping Templates ▪ Civil / Structural Templates ▪ Electrical and Control Systems Templates ▪ Material Handling Templates ▪ HVAC Templates ○ Design Reuse Benefits <ul style="list-style-type: none"> ▪ “Fully” Automated Drawings ▪ Minimize Manual Annotations 	

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		<ul style="list-style-type: none"> ▪ “Pre-Configured” & “Standardized” Global Templates ▪ Project Configuration Savings ▪ Operational Consistency for Distributed Execution ▪ Provide multi-office Project deliverables <ul style="list-style-type: none"> • Fluor’s NEXTGENERATIONsm “THINKING FORWARD” <ul style="list-style-type: none"> ○ As New Intergraph SmartPlant Tools are developed Fluor’s NEXTGENERATIONsm Team will create new Global Work Processes and Practices ○ Optimize Fluor’s NEXTGENERATIONsm Work Processes and Practices to leverage the SmartPlant Foundation Integration and Global Project execution ○ Establish Fluor’s NEXTGENERATIONsm Team as a beta test facility for Intergraph SmartPlant suite Tool and Feature development ○ Fluor’s NEXTGENERATIONsm Team will continue to work with vendors in the supply chain to facilitate SmartPlant suite integration with vendor sizing, selection and procurement software • SmartPlant P&ID Engineering Integrity <ul style="list-style-type: none"> ○ Rule Based Graphics and Data Validation ○ Avoid making costly changes late in a project cycle ○ Ensure the quality and dependability of P&ID data ○ Capture Fluor's Best Practices • SmartPlant P&ID Engineering - Data Editor <ul style="list-style-type: none"> ○ Allows Engineering Access to P&ID Data and Properties without affecting Process Graphics ○ Cross Discipline SmartPlant P&ID Work Processes ○ Establishes Discipline Data Ownership in P&ID ○ Improves Quality of Data Integration ○ Allows Control Systems Access to P&ID Tag and Loop Data without affecting Process Graphics ○ Adds the Ability to normalize the Instrument Types and Descriptions between SP-P&ID and SPI ○ Improves Quality of Instrumentation Data so additional Data can be Published and Retrieved to SPI • SmartPlant Instrumentation Macro Expansion <ul style="list-style-type: none"> ○ Allows Control Systems Access to P&ID Tag and Loop Data without affecting Process Graphics ○ Adds the Ability to normalize the Instrument Types and Descriptions between SP-P&ID and SPI 	

Item	Topic	Notes	Action/Due
		<ul style="list-style-type: none"> ○ Improves Quality of Instrumentation Data so additional Data can be Published and Retrieved to SPI • New SmartPlant Instrumentation Cable Browser View <ul style="list-style-type: none"> ○ Allows SPI to export the instrument cable requirements to SPEL ○ SPEL can then Publish both Electrical and Instrument Cable requirements to SP3D for Tray Loading ○ Cable Tray Routing and Loading done in SP3D will Provide Lengths and Routing Data ○ The SP3D Cable Lengths and Routing is Published Back to SPEL ○ Cable Schedules can be Published from SPEL for Electrical and Instrument Cables or ○ Instrument Cable Data may be Exported from SPEL and Imported into SPI for Instrument Cable Schedules <p>Notes: Fluor has discovered issues w/ SPF on their Next Generation Projects Nezar asked question about SPI <> SPF interaction John Dressel mentioned hint of Intergraph planning toward 2014-2015 RE-WRITNG SPI (using visual Basic format) and making SPI much more user friendly and cross-platform to integrate with other SmartPlant tools. Interfaces will be much smoother.</p>	
7	Presentation	<p>Documenting Special Systems Using SPI John Dressel, FLUOR Applications Specialist</p> <ul style="list-style-type: none"> • Special Control Systems beyond Basic Process Control Systems (BPCS) <ul style="list-style-type: none"> ○ Safety Instrumented Systems (SIS) in SmartPlant Instrumentation ○ Emergency Shutdown Systems (ESD) in SmartPlant Instrumentation ○ Burner Management Systems (BMS) in SmartPlant Instrumentation ○ Asset management systems (AMS) in SmartPlant Instrumentation ○ Fire and Gas Systems (F&G) in SmartPlant Instrumentation • Special Wiring Systems beyond Conventional 4-20 ma Instruments <ul style="list-style-type: none"> ○ Smart HART and other Digital wiring systems ○ Communications Wiring Systems ○ Foundation Fieldbus and other Bus wiring systems 	

Item	Topic	Notes	Action/Due
		<ul style="list-style-type: none"> ○ Wireless Instrument Systems • Other Special Systems documented in SmartPlant Instrumentation • Safety Instrumented Systems in SPI <ul style="list-style-type: none"> ○ Additional Index Data for Safety Instrumented Systems: <ul style="list-style-type: none"> ▪ SIL Ratings ▪ Interlock Numbers ▪ Maintenance Cycles ▪ Instrument System Identifiers ▪ Special Notes for Design Engineering ○ User Defined Fields and Tables for Safety Data ○ Additional Spec Sheet Data for Safety Instrumented Systems: <ul style="list-style-type: none"> ▪ Safety Integrity Level Ratings ▪ Approvals and Testing Requirements ▪ Certifications and Approvals ▪ Redundancy or Conditioning Requirements ▪ Special Notes for Design Engineering ▪ Partial Stroke Testing Requirements (for Valves) ○ New Spec Sheets May Need to be Added for Safety Devices ○ Issues When Wiring Safety Instrumented Systems: <ul style="list-style-type: none"> ▪ PLC I/O Redundant Power Distribution uses common bus ▪ Maintain Physical Separation between SIS and BPCS wiring ▪ Minimize terminals and connections as points of failure ▪ Special Colors, Markings and Labels for Safety Systems ○ May Need to Create Ladder Wiring instead of Loop Diagrams ○ Value added to SIS by documenting with SPI <ul style="list-style-type: none"> ▪ Integrity of a Data Centric Environment for SIS Information ▪ Management of Change meets Regulatory Requirements ▪ Controlled Access and Records Keeping Needed for SIS ▪ Real Time Access to Data for Quick Disaster Response ▪ SPI System remains in place for the lifecycle of the plant 	

Item	Topic	Notes	Action/Due
		<ul style="list-style-type: none"> • Emergency Shutdown Systems in SPI <ul style="list-style-type: none"> ○ Additional Index Data for Emergency Shutdown Systems: ○ Interlock Numbers ○ Instrument System Identifiers ○ Issues When Wiring Emergency Shutdown Systems: ○ Triple Redundant Control Logic and I/O ○ Special Colors, Markings and Labels for Safety Systems • Burner Management Systems in SPI <ul style="list-style-type: none"> ○ Additional Index Data for Burner Management Systems: ○ Interlock Numbers ○ Instrument System Identifiers ○ Additional Spec Sheets for Burner Management Instruments ○ Issues When Wiring Burner Management Instruments: ○ Furnished controllers and instruments with isolated system ○ Special Colors, Markings and Labels for Burner Management System • Asset Management Systems in SPI <ul style="list-style-type: none"> ○ Additional Index Data for Asset Management Systems: ○ Functional Location for SAP Unique Identifier ○ Asset Management System Identifiers ○ May use the SmartPlant Instrumentation SAP Interface for Data Transfer ○ Asset Management Instruments Data requirements: ○ Interface with HART Data, DCS Configuration and Field Calibration Databases ○ Generally defined by Owner Operator requirements • Fire and Gas Systems in SPI <ul style="list-style-type: none"> ○ Additional Index Data for Fire & Gas Systems: ○ Additional Instrument Types for Fire and Gas Instruments ○ Instrument System Identifiers ○ Instrument Location drawing or zone definitions ○ Additional Spec Sheets for Fire and Gas Instruments ○ Issues When Wiring Fire and Gas Instruments : ○ Different and Mixed wiring topographies generally prohibit using SPI for wiring • Smart HART Digital wiring systems 	

Item	Topic	Notes	Action/Due
		<ul style="list-style-type: none"> ○ Additional Index Data for HART Digital wiring systems: ○ It is not just 4-20 mA anymore ○ Process, Alarm and Trip data now reside in the Off Line Instruments ○ May require HART Enabled I/O, Multiplexer and Interface devices ○ Wiring HART Digital wiring systems: ○ Wires much like conventional 4-20 mA instrument systems ● Communications Wiring Systems in SPI <ul style="list-style-type: none"> ○ SmartPlant Instrumentation Telecom Module: ○ Build and Index all Communication Devices ○ Fiber Optic and Network wiring definitions ○ Need Specification Library for Communication Devices ○ Communications Wiring Systems: ○ Uses Block Diagrams or Point to Point Diagrams ○ SmartPlant Instrumentations Cable Block Diagram needs enhancement ● Foundation and other Fieldbus wiring systems <ul style="list-style-type: none"> ○ Steps when developing a Fieldbus System in SmartPlant Instrumentation <ol style="list-style-type: none"> 1. Define the Segment-Wide Parameters for the project 2. Define Foundation Fieldbus instrument type profiles 3. Add a new browser view for Fieldbus Manager 4. Create user-defined function blocks (if required) 5. Associate function blocks with instrument types 6. Create Foundation Fieldbus instruments in Index 7. Generate Fieldbus Device Specifications 8. Associate unique Function Blocks with Fieldbus Tags 9. Create Fieldbus Segments in the Fieldbus Manager 10. Associate Fieldbus Instruments with Segments 11. Design your wiring and termination equipment 12. Add your Fieldbus home-run cables and spurs 13. Make required cable connections and associations 14. Connect the Fieldbus I/O H1 assignments 15. Generate Fieldbus validation reports (if required) 16. Generate segment diagrams and wiring reports 	

Item	Topic	Notes	Action/Due
		<ul style="list-style-type: none"> • Some Issues with Bus systems in SPI <ul style="list-style-type: none"> ○ Virtual Field Devices (Function Blocks) add records to the Index ○ Fieldbus Page for Spec Forms is not cost effective ○ Left and right wiring on bricks makes segment diagrams awkward ○ Conservative Global Parameters are more effective than Validation reports ○ No AutoCAD or Microstation Segment Diagrams available in SPI • Wireless Instrument Systems in SPI <ul style="list-style-type: none"> ○ Steps when developing a Wireless System in SmartPlant Instrumentation <ol style="list-style-type: none"> 1. Create User Defined Fields in The Index <ul style="list-style-type: none"> • Scan rate • Gateway • Wireless adapter • Plan Drawing 2. Define Wireless Device instrument type profiles 3. Add a browser view for Wireless devices 4. Develop Spec Sheets for Wireless Transmitters 5. Create custom symbols for Wireless Transmitters 6. Develop Spec Sheets for Wireless Gateways 7. Create custom symbols for Wireless Gateways 8. Create Wireless Gateway Diagrams <ul style="list-style-type: none"> • May be Block Diagrams or • Gateway Loop Diagrams • Other Special Systems Documented in SPI <ul style="list-style-type: none"> ○ Emerging Technology <ul style="list-style-type: none"> ▪ CHARMS and Electronic Marshaling with remote I/O are becoming more popular ○ Ethernet and other Networks <ul style="list-style-type: none"> ▪ Many Instruments have Ethernet connectors and will configure as Plug and Play ○ Motor Control and Smart Electrical Switchgear <ul style="list-style-type: none"> ▪ Electrical Motor Control Centers and Switchgear are getting more programmable and compatible with Instrument Control Systems <p>Notes: Telecom Module:</p>	

Item	Topic	Notes	Action/Due
		<p>Creates a lot of devices that aren't instruments in the Index and keeps track of them Documenting the fiber optic in the block diagrams Doesn't require additional licenses</p> <p>Safety Instrumented Systems in SPI ... (Slides will be online) "every terminal in a Safety Instrumented loop, affects the SIL rating"</p> <p>Emergency & Burner Management Systems ... like other Safety, but needs other instruments, specs, and controls</p> <p>Asset Management Systems VERY important to Owners/Operators, Intergraph DOES have an Asset Management System, and John D suggests a separate Instrument Types field for Safety (Asset Management) Identifiers.</p> <p>Fire & Gas Systems – Additional Index Data & Instrument Types</p> <p>HART Digital Wiring, etc.</p> <p>Emerson CHARMS sales pitch @ slide for "Other Special Systems Documented in SPI" – Electronic Marshalling and Remote I/O ...</p> <p>We need to promote the Honeywell I/O Catalog Library families which include Safety Series SM_FSC as well as our upcoming Bidirectional Interface in a future meeting</p>	
8	Wish List	<p>As part of the LTUF effort to improve the SmartPlant Instrumentation software and keep Intergraph informed as to improvements, enhancements and functions the user community would like to see in the software, we brainstormed a wish list at the May 15, 2012 Houston SPI LTUF meeting.</p> <p>This is a list of the wishes developed during that session:</p> <p>General Wishes:</p> <ol style="list-style-type: none"> 1. When selecting a Unit column in a Browser it should be only the <i>Unit</i> and not <i>Plant/Area/Unit</i> 2. Redevelop the Import Module. Make it friendlier ☺ 3. Sub classifications for Instrument Types 4. Wildcard searches for dropdown lists 5. More Excel templates for exporting 6. Open process data, calculations or spec sheet access across PAU from Domain Explorer 7. Ability to tile windows vs. tabs 8. Add text back to icons in all modules 9. Add UDF's to corresponding entity property windows 10. Intergraph to have seat on PIP committee <p>Index Wishes:</p> <ol style="list-style-type: none"> 1. A standard field for Location Plan Drawing 2. User definable tab for user to define his/her own data 	

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		<p>in the Instrument Profile</p> <ol style="list-style-type: none"> 3. System/subsystem table I/O's 4. Control Systems Tag Browser 5. Separate folder for local devices in Domain Explorer 6. Separate folder for VFD in Domain Explorer 7. Standardized field for specialized systems 8. NE100 list of properties for vendor interfaces <p>Spec Module Wishes:</p> <ol style="list-style-type: none"> 1. All Title blocks to be ISO9000 compatible with Checked and Approved signatures 2. UOM character limit needs to be expanded 3. Normalization of spec_udfs 4. Spec_udf browser limited to spec_udf99. Expand to other spec_udfs 5. CWP and Project as line item for each revision 6. External Editor to edit panel and cable specs 7. Ability to apply panel and cable specs to project items 8. Expand Spec form 70 fields from 20 to field limit 9. Child/parent spec capability 10. A method of controlling notes on second page by form <p>Process Data Module Wishes:</p> <ol style="list-style-type: none"> 1. The ability to apply Process Design Conditions to Equipment as well as lines and propagate to tags (by preference) 2. Editable process data forms 3. User preference to copy process data notes to spec notes 4. Being able to view process data sheets when locked out from Process <p>Calculation Module Wishes:</p> <ol style="list-style-type: none"> 1. Thermowell wake frequency calculation per ASME PTC 19.3 TW-2010 2. Flow meter calculations for new technology 3. Calc Module to have the same governing rules as Spec Module 4. Incorporate Consolidated RV calculation into SPI <p>Wiring Module Wishes:</p> <ol style="list-style-type: none"> 1. The ability to generate all Wiring, Loops and Segment Diagrams in AutoCAD or Microstation 2. Batch print multiple ESL reports 3. Enhanced and configurable Auto-crosswire 4. Default cross-wire to be available in the Wire Browser 5. Batch segment drawings 	

Item	Topic	Notes	Action/Due
		<p>6. Friendlier interface for ESL New macro function</p> <p>SmartPlant Foundation Wishes:</p> <ol style="list-style-type: none"> 1. The ability to turn off SPF Document Management and Revision control 2. Ability to communicate with Projects in OO mode 3. Cable Publish/Retrieve To SPEL & SP3D 4. Better As Built Support across all SP Applications <p>Change Request Ranking Website Wishes:</p> <ol style="list-style-type: none"> 1. Completed CR's should automatically get archived 2. Intergraph to track & status listed CR's (inform if pending / complete) 3. Enhanced LTUF ranking <p>SPP&ID and SPEL - SPI Interfaces Wishes:</p> <ol style="list-style-type: none"> 1. Maintain the direct Interface without the Foundation 2. Equipment spec data in SPI available through application <p>Owner Operator Wishes:</p> <ol style="list-style-type: none"> 1. Interfaces for common Calibration and Maintenance Software 	
9	Close	<ul style="list-style-type: none"> • Next Meeting - August 14, 2012, Hosted by Mangan at Phoenix Contact, 3993 Texas 8 Beltway, Houston, TX 77043 • John Dressel closed meeting 	