SmartPlant Instrumentation Technical User Forum P2C2 (Houston SPI TUF) Meeting					**February 11, 2014 7:30 am Mangan Inc.**	
Attendees	38 Members in attendance 10 Online Connections		**Copied To**	Houston SPI LTUF Website		
Called By	John Dressel	**Prepared By**	Andrew Kunev, Betty Alexander & John Dressel			

Item	Topic	Notes	Action/Due
1	Welcome	Welcome to Mangan & Safety Moment Richard Gaas, Mangan About Mangan Inc. Marvin Walton, Mangan • 8 offices across U.S. • Control Automation Specialty company • Specialty Engineering, SPI, leveraging tool for Safety	
2	Chairman's Notes	John Dressel, Fluor • **Intergraph will not give a SPI product update or Owner Operator Presentation at this meeting.** Minutes from prior meeting were approved. Introductions were done. Officers Reelected • John Dressel, Chairman • Gene Haney, Vice Chair • Betty Alexander, Secretary	
3	Presentation	ISA 84 and SmartPlant Instrumentation John Dressel, Fluor • Process Module – o Process Data needs to be entered by Process Engineers; o Hardly any companies uses it by process engineers; gives process engineers ownership of the data. o 12 levels of alarm o Entry in the process module will populate to the DCS Alarms • Calculation Module – o Batch calculations; o Basis of calculations are also published. o Relief valve calculations is cumbersome • Hook-up module – o Hook-up modules are being used more; o seed files come with standard; o BOM is generated. o Assemblies used by some, o Fluor used to use UDFs. o Now Fluor likes Hook-Up o Seed files & BOM - Viable Functional part of SPI • Calibration Module - o Primarily used by Owner/Operator. o Calibration Recording is set up, o Trace-able & Auditable. • Maintenance Module -	

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		○ Also used by mainly owners; ○ Preventive maintenance • DDP Module – ○ If you use Smartplant 3D Module, especially useful ○ Allows piping to begin early on the project ○ Especially when using SP3D for Inline Instruments ○ Vendor info & built in Group • Maintenance Module - ○ Also mainly O/O: ○ Work Requests & Logs … ○ SAP interface • Document Binder – ○ Most people HAVE used it successfully only engage it LATE in SPI for final deliverable combinations ○ Attaching external docs Browser's will be more powerful in 2015 • Reference Explorer – ○ Can be utilized better to optimize the Explorer • Macro Expansion - ○ Can be used in loop templates ○ SPI build instruments further than P&ID • Import Utility – ○ Can be used for wiring imports; ○ Value with Specs and Wiring perhaps ○ NOT USED FOR NEW TAGS • Merger utility – ○ Database Merger issues in newer versions ○ Room dislike, but CoP has positive experience ○ Separate domain Mergers bad. ▪ Eng_Ref_ID has poor collection for Multi projects. ▪ Merge_Release_Flg bad with Interfaces ○ Might be fixed in 2015. • Symbol Editor for Smartsketch ○ Allows starting points for symbols ○ Telecommunication module symbols aren't very good. • Telecom Module – FREE – ○ Working with Coax and Fiber Optics ○ Disadvantage - Point to point is primitive. • IS and FF Validation – ○ Calculations should be used done on worst-case scenarios. • External Spec Editor – ○ Used to export datasheets to outside vendor. • External Editor for Process – ○ License required ○ Needs to import back into process • Many additional Options & Functions… Q&A • O/O presentation pending someday for Maintenance Module • Reminder Reference Library & Terminator Need for FFB Validation	

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4	Presentation	Mangan - MSS SPInspector Software
		
		Nezar Faitouri, Mangan
		
		• History for the SPInspector Software
		  ○ One of the Mangan's major customers in the Oil & Gas field approached Mangan to create a set of audit procedures to ensure all of their SPI database sites (7 sites in the USA) have:
		  ▪ Data Consistency
		  ▪ Healthy Database
		  ▪ Project Review before merging (QA/QC)
		  ▪ Project management review before close out.
		  ○ The customer evaluated other SPI audit software; however, due to the additional setup steps, configurations, and IT involvement, it was determined that it is best to build the SPI audit procedures using SQL statements and then develop an easy software to manage, execute, and report.
		
		• Purpose of the Audits and Software
		  ○ The audits and the SPInspector software will ensure the following:
		  ▪ A stronger communication between the SPI admin and the SPI users
		  ▪ Provide a strong gap analysis and the health of the SPI database
		  ▪ Allows the SPI users to review their project work before issuing (As-Built and Projects)
		  ▪ Allows the SPI admin to review project work before merging projects
		  ▪ Allows project managers to review project work before signing off on a project
		  ○ The SPInspector audit queries are not designed or customized based on the customer databases. It is designed to query all SPI databases based on previous experienced issues with other databases (10+ years of experience with other customer databases and issues).
		
		• SPInspector Software GUI
		  ○ The SPInspector software is a windows (.exe) application. The installation is very easy (4 wizard steps).
		  ○ The GUI looks similar to SPI. The Groups will reflect the Audit Items "Similar to SPI modules"
		  ○ Within each group, there are Sub-Groups
		  ○ The Audit Items are executed by selecting check boxes. They can be run one by one or in batch mode (Per Sub-Group)
		  ○ The software allows connection to SPI domain, location to result files, and format of file name.
		  ▪ Database Connections are Oracle 10, and 11 or MS-SQL 2005 and 2008.
		  ▪ Compatible with SPI 2007, 2009, and 2013
		  ▪ The SPI schema name and password could be the overall SPI schema name and password or a project schema name and password.	

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		▪ Output Format is CSV or Excel: • CSV: Each query will have an individual file • Excel: Sub-Group queries are saved in one file with multiple sheets. • SPInspector Items o Identifying Duplicate Items ▪ Instrument Index Items (Loops, Tags, P&ID, Lines, Equipment, Manufacturers, Model Numbers, Instrument Types, etc.) ▪ Reports (Document Numbers) ▪ Wiring Items “Names and Sequences” (panels, cables, terminals, wiring equipment, signals, CS tags, etc.) o Identifying Minimum Data Requirements ▪ Loops (Measure Variable, Type, P&ID, etc.) ▪ Tags (Manufacture, Model, Line Number, Equipment Number, I/O, etc.) ▪ Panels (Manufacture, Model, Location, etc.) ▪ Cables (Class, Type, Description, Type, etc.) o Instrument Index Data ▪ Line Number Insulation letter (Ih, Is, etc). Capital I vs. Lower case L “l” ▪ The word (See notes) in the manufacturer and model tables ▪ Lines and equipment with no types ▪ Fieldbus (tags with no segments, tags with CS tags, VFD tags with no fieldbus tag association or I/O association, etc.) ▪ Inconsistency between Tag class and Tag I/O ▪ Model numbers and no manufacturer ▪ Lines and no piping data ▪ Inconsistency between loop and tags for service, P&ID, equipment, and the apply check boxes. ▪ Inconsistency between instrument tag and instrument type profile (wiring, I/O type, spec sheets, etc.) ▪ Leading and ending spaces (service descriptions, equipment, etc.) ▪ External associated documents o Wiring Data ▪ CS tags (no tag association, no I/O association, etc.) ▪ Device panels (no connections, I/O signal propagation, etc.) ▪ Panels and cables with ? Marks, Copy Of, and Parenthesis ▪ Cables, jumpers, and cross wiring and no connections ▪ Fieldbus segments (no I/O association, no tags, etc.) ▪ Multi-input devices ▪ Wiring items with leading and ending spaces ▪ Inconsistency between tag I/O and IO card/termination I/O	

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		▪ Cables, jumpers, and cross wiring with one end connection ▪ Mismatch connections within the same cable set ▪ Invalid ID values for wiring equipment associations o Reports ▪ Reports with no revisions (specs, PD, calculations, loops, wiring, etc.) ▪ Reports with no document names (specs, PD, calculations, loops, wiring, etc.) ▪ Inconsistency between item PAU and report PAU o ESL Tables ▪ Missing Redlining and Symbols for ESL reports ▪ Lost ESL macros and positioning ▪ Corrupted ESL default layouts o Claim and Merge flags (Merge Release flag) • SPInspector Results o The software does not just inspect one unit or one project, it Audits the entire SPI domain. o The software can be configured to inspect one project at a time if needed. o The Audit results will be saved in an excel file or CSV file. The file names are pre-defined. o The purpose of excel or CVS is for easy data manipulation, sorting, filtering, formulas, etc. o Also, the purpose of excel or CSV that it can be used to import the manipulated data or creation of SQL statement for fixes. • SPInspector Future Items o An additional 150+ audit items that will cover the: ▪ Process Data tables ▪ Usage of UDF's ▪ Hookup Module ▪ Claim and Merge Issues ▪ Revision comparison (Latest Revision) between As-Built and Projects for Claimed Items ▪ Revision comparison (all Revisions) between As-Built and Projects for Claimed Items o Allow execution for all Audit items at one time o Creation of a Favorite Group o Creation of a Custom Group o ***Creation of a project percent completion Group *** • Customers Comments o Recently we implemented programs to evaluate each facilities' database and the SPInspector software has provided an opportunity for us to identify areas for improvement and perform an assessment of our instrument engineering information. o We completed these audits and studied the trends of data to determine the proper approach for resolution. o Our Company used this software to perform an evaluation of various types of data and implement	

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		strategic corrective actions where needed. o The software collected results including duplicate records and repeated loop or instrument tag properties, multiple instrument specifications and loop diagram documents, or other undesired conditions and attributes of data. o The results were reviewed and together we've applied effort and dedication to resolve thousands of records. o As we continue to interpret the results, complete the validation process and establish new goals; Mangan has continued to support our team and develop enhancements as our initiatives continue to correct the audited information. o In 1989 when we installed the first DCS system we used an in-house design tool. As a result, we are fortunate to have the entire plant captured in a design system. In 1999 we migrated the data into SPI. o As a result of 25 years of data entry and the start of a large new project, we decided it was time to do some database clean up. o SPInspector was selected as one of the tools to help us meet this requirement. o SPInspector is simply to install and use. o We have run all the checks and filed the results, but so far have only resolved some. Resolving the discrepancies highlighted by SPInspector is where time and effort comes in. o We plan to priorities the checks that need to be done regularly and would like to put these into a sub-group. SPInspector will go a long way in helping us maintain a clean database.	
5	Presentation	Owner Operator Guide to Emerging Smart Technology John Dressel, Fluor • Instrument Technological Revolution o Process Measurement and Control Technologies are Increasing and Emerging at an alarming rate o New and Emerging Smart Technologies: ▪ Chip Sets = Smart = Data ▪ HART Protocol = Smart = Data ▪ Fieldbus = Digital = Data ▪ Wireless = Networks = Data ▪ Web Centric = Cloud = Data ▪ Networks = Systems = Data ▪ Bluetooth = Connectivity = Data ▪ Remote I/O = Networks = Data ▪ Electronic Marshalling = Data o The Emergence of Data Centric Instrument Systems has caused the decline of Technologies o Outdated Instrument Technologies: ▪ Pneumatic Instrumentation ▪ 4-20 mA Analog Signals ▪ Hardware Based BPCS ▪ Dedicated DCS Consoles ▪ I/O Buildings and Rooms ▪ Multi-core Homerun Cables ▪ Switch and Hard Wired Logic	

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		▪ Discrete Field Switches • Obstacles to Smart Instrumentation o Outdated or Ignored Instrument Standards o Capability of CAE Software to Document New Tech o Under Trained or Uninformed Engineering User Base o Owner Operator Acceptance of New Technologies o Obstructive Paradigms to New Tech: ▪ "This is the way we've always done it" ▪ "It is not secure enough for our use" ▪ "We don't know how to maintain it" ▪ "This technology is too complex" ▪ "This technology is not proven" ▪ "It will confuse our Operators" • Updated Instrument Standards o Standards are continually being Updated: ▪ ISA-84/IEC 61511 Safety Instrumented Systems (2004) ▪ ISA-95/IEC 62264 Control System Integration (2005) ▪ ISA-18/IEC 62682 Management of Alarm Systems (2009) ▪ ISA-88/IEC 61512 Batch Control (2010) ▪ ISA-100/IEC 62734 Wireless Systems for Automation (2010) ▪ IEC 62591 WirelessHART® System Engineering (2010) ▪ ISO 26262/IEC 61508 Functional Safety Equipment (2011) ▪ ISA-99/IEC 62443 Cyber Security for Control Automation (2013) o Plants Engineered, Built or Updated after the latest release of a standard should Follow or Update to the latest Standard as "Best Practice" o ANSI/ISA-5.1-2009 Instrumentation Symbols and Identification has significant changes over the previous version ISA-5.1-1984 (R1992) o This standard has been updated to include New and Evolving Instrument Technology, Control Systems and Computer Networks o Instrument Types and Naming Conventions as defined on the P&ID dictate the Instrument Types used by SmartPlant Instrumentation • ANSI/ISA-5.1-2009 – Added Definitions o Analog o Application Software o BPCS o Communications o Computer Control System o Data Link o Detector o Discrete Signal o Field Instrument o Hardware	

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		○ HLCS ○ Software • ANSI/ISA-5.1-2009 – Table 4.1 ○ Identification letters table ▪ C – “Close” Modifier ▪ D – “Deviation” Modifier ▪ G – “Gauge” Function ▪ O – “Open” Modifier ▪ R – “Run” Modifier ▪ S – “Stop” Modifier ▪ W – “Probe” Function ▪ X – “Accessory Device” ▪ Z – “SIS” Variable Modifier • ANSI/ISA-5.1-2009 – Table 5.1.1 ○ Column A - DCS - BPCS ▪ Primary Shared Control System (DCS) ▪ Basic Process Control System (BPCS) ○ Column B - PLC - SIS ▪ Alternate Shared Control System (PLC). ▪ Safety Instrumented System (SIS) ○ Column C - Software ▪ Computer Functions and Software ▪ High Level Control System (HLCS) ○ Column D - Hardware ▪ Discrete Primary Elements ▪ Discrete Transmitters ▪ Discrete Switches and Indicators ▪ Discrete Transponders and Relays ▪ Discrete Hardware Controllers ▪ Discrete Final Control Elements ▪ Discrete Control Valves • ANSI/ISA-5.1-2009 – Table 5.2.2 ○ Table 5.2 is a new table for Measurement Notations and has added several New Technology Functions • ANSI/ISA-5.1-2009 – Table 5.2.3 ○ Primary element symbols with several new symbols for special Orifices and Measurement Technology • ANSI/ISA-5.1-2009 – Table 5.3.2 ○ Added Line symbols with new symbols and signal types for Wireless, Fieldbus, Smart and Serial Communications • ANSI/ISA-5.1-2009 – Table 5.4.2 ○ Final control element actuator symbols with new Valves with positioners and partial stroke testing device symbols • ANSI/ISA-5.1-2009 – Annex A ○ Annex A has expanded Tables for Allowable Loop, Tag & succeeding letter combinations for instrument functions ○ Added Function modifiers PF = Ratio, PQ = Total,	

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		PS = Safety & PZ = SIS o ISA now recognizes over unique 1000 Instrument Type identifiers • ANSI/ISA-5.1-2009 – Annex B o Annex B, "Graphic symbol guidelines" (Informative), is a new informative clause that replaces the examples formerly given in Clause 6, "Drawings," to provide some limited assistance in the application of the symbols in Clause 5. These examples are more generic and limited in nature than the previous ANSI/ISA-5.1-1984 (R 1992) o Note the use of the "FC" Field Controller for Fieldbus VFD • Documenting New Tech on Smart P&ID o The P&ID Defines all Elements of the Technology o Use the Latest Symbols (ANSI/ISA-5.1-2009) o Show Every Tag and Valve (No "Implied" Tags) o Show the Signal Type and Technology of Every Element o Be Mindful of the Smart P&ID Data Integrity and Quality o Expect and Use Data Integration to other Smart Software • Documenting New Tech with SmartPlant Instrumentation o SmartPlant Instrumentation has the Ability to Document any New Technologies with Minimal Modifications o Define New Instrument Types for Emerging Technologies o Develop New Spec Forms for New Tech Devices o Document Fieldbus and Profibus with the Wiring Module o Document Networks using the Telecommunications Module • How Engineers Cope with New Tech o Because Emerging Technologies are developing at such a rapid pace it is necessary for CS Engineers to: o Get Additional Training on New or Emerging Technologies o Attend User and Vendor Conferences and Seminars o Attend Lunch & Learns on New Products and Technologies o Use Knowledge Management Systems for Collaboration o Become Subject Mater Experts centered on New Tech o Work directly with Vendors to develop New Technology o Join Standards Organizations and Serve on Committees o Engineers need to bring Answers about New Technology to the Owner Operator Clients – Not	

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		Questions! • Owner Operator Acceptance of New Tech o When it comes to New and Emerging Technologies - "The Customer is Not Always Right!" o It is the Engineering Companies responsibility to keep up with New Technologies and Advise Clients Accordingly o Operating Companies hire EPC's to do the engineering expecting the companies to engage current Best Practices o Clinging to Existing Technologies will Create Built-in Obsolescence when Developing New or Updated Facilities o Owner Operators and Engineering Companies Share the Risk when the latest Standards are not followed • Accepting New or Emerging Technology may require a Paradigm Shift by the Owner Operator Client o Self Knowledge – Educate Yourself about New Tech o Interaction – Work with Engineers and Vendors on New Tech o Adaptive Thinking – Accept Change when Using New Tech o Digital Literacies – Embrace Data Centric Instrumentation • Paradigm - "This is the way we've always done it" o Most Existing Plants are more than 10 Years Old and the Measurement and Control Technology is long outdated o Digital Technologies are more accurate and dependable o Digital Technologies are more efficient than 4-20 mA Analog that has a high demand for instrument air supplied technologies o Emerging Technologies of today will be "the way we've always done it" of the future • Paradigm - "It is not secure enough for our use" o Cyber Security and Digital Information networks are much more secure than previous generation technology o Most concern about security is around wireless and networks: o WirelessHART and ISA100.11a meets the Federal Information Processing Standard 197 (FIPS-179) and both are AES-128 encryption (NIST/IEEE 802.15.4) compliant o Industrial Automation and Control Systems Network manufactures, Integrators and end-users comply with the ISA/IEC-62443 (Formerly ISA-99) set of Standard Documents • Paradigm - "We don't know how to maintain it"	

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		○ Almost all obsolete, and difficult-to-maintain analog technology for Measurement and Control systems in the U.S. have been replaced with digital systems aver the last 10 to 20 years ○ The advantages of digital technology is improved diagnostics capability and system reliability requiring less maintenance ○ Some digital instrumentation has been in place in most installations for almost 20 years and current calibration and maintenance equipment are designed to be used with it • Paradigm - "This technology is too complex" ○ Digital Instruments have fewer moving parts and are simpler to read, diagnose and access than analog instruments ○ The use of computers and standard networks allow access to a wide variety of off the shelf components ○ Every major media in use today is based on Digital Technology (Communications, Computing, Television, Recording, Measurement and Control) • Paradigm - "This technology is not proven" ○ Current Standards support Digital Technology ○ Current Best Practices are based on Latest Tech ○ Digital Instrument Systems are Proven in Use ○ Equipment is Certified as Fit for Purpose ○ Technology must be Competitive to Market • Paradigm - "This technology is not proven" ○ Current Standards support Digital Technology ○ Current Best Practices are based on Latest Tech ○ Digital Instrument Systems are Proven in Use ○ Equipment is Certified as Fit for Purpose ○ Technology must be Competitive to Market • Digital Measurement and Control Technology is the New Standard THINK SMART! Think SmartPlant! Think SmartPlant Instrumentation!.	
6	Forum Topics	Forum Topics All Attendees • SPI Owner Operator As-Built Mode • SPI Integration to other Tools • SPI Version 2013 Upgrade • SPI Version 2015 Expectations • Other SPI Topics	
7	Close	• Next meeting will be hosted by CB&I on May 13, 2014 to focus on a preview of HxGN LIVE 2014 • John Dressel closed meeting and thanked Mangan for	

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		Hosting	