



GM Scalable Error Proofing (SEP) System Acceptance Test (SAT) – PART I North American Execution (NAX)



GM SEP: VCVS Steering Column (SCOL) QAS GSP

Sequence No. (CSN) 7143 DW

131193874 1FA179 36%

PART NUMBER

35 ABDW

35 ABDW S 660970363

GM1737 DONE Step 1 of 1

Step GMT-900 SCOL DW DZ

D6 DZ DZ

PVI: 131193107 SCOL: D6 CSN: 1FA1797147

PVI: 131193812 SCOL: DZ CSN: 1FA1797146

PVI: 131193872 SCOL: DZ CSN: 1FA1797145

PVI: 131193910 SCOL: DZ CSN: 1FA1797144

PVI: 131193874 SCOL: DW CSN: 1FA1797143

PVI: 131193513 SCOL: DZ CSN: 1FA1797142

RUNNING: STOP F1

RESET APP F2

EVENT LOG F3

LANGUAGE [EN] F4

TRACKING BAR F5

RESTART JOB F6

VEHICLE LOG F7

DEFECT LOG F8

TRACE LOG F9

SUPPORT MODE F10

SUPPORT TOOLS F11

Status: Ready 08-Feb-13 10:01:51 AM

Rf:0 Wf:0 Ps:5 Gt:4 Scale:Level 3 Mode:Online 1.564 MB P3CO TZNI:DD 36%

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SEP/EPP Overview

Overview of **terminology** in use describing SEP/EPP System components.

- **COSS = GEP = SEP/EPP**– each rename corresponded to a Project to improve the existing error proofing system
- **EPP** = Error Proofing Platform, a new GCCS-2 ‘like’ system

***Note:** Currently Plants use the terms **GEP** and **SEP** interchangeably because many SEP software components are still labeled “GEP”*

- **Hardware** – physical components, both IT and Controls
- **Software** – 3rd party and GM proprietary
- **Configuration** – data collected and input into system during deployment and system maintenance



Hardware components used for Error Proofing...

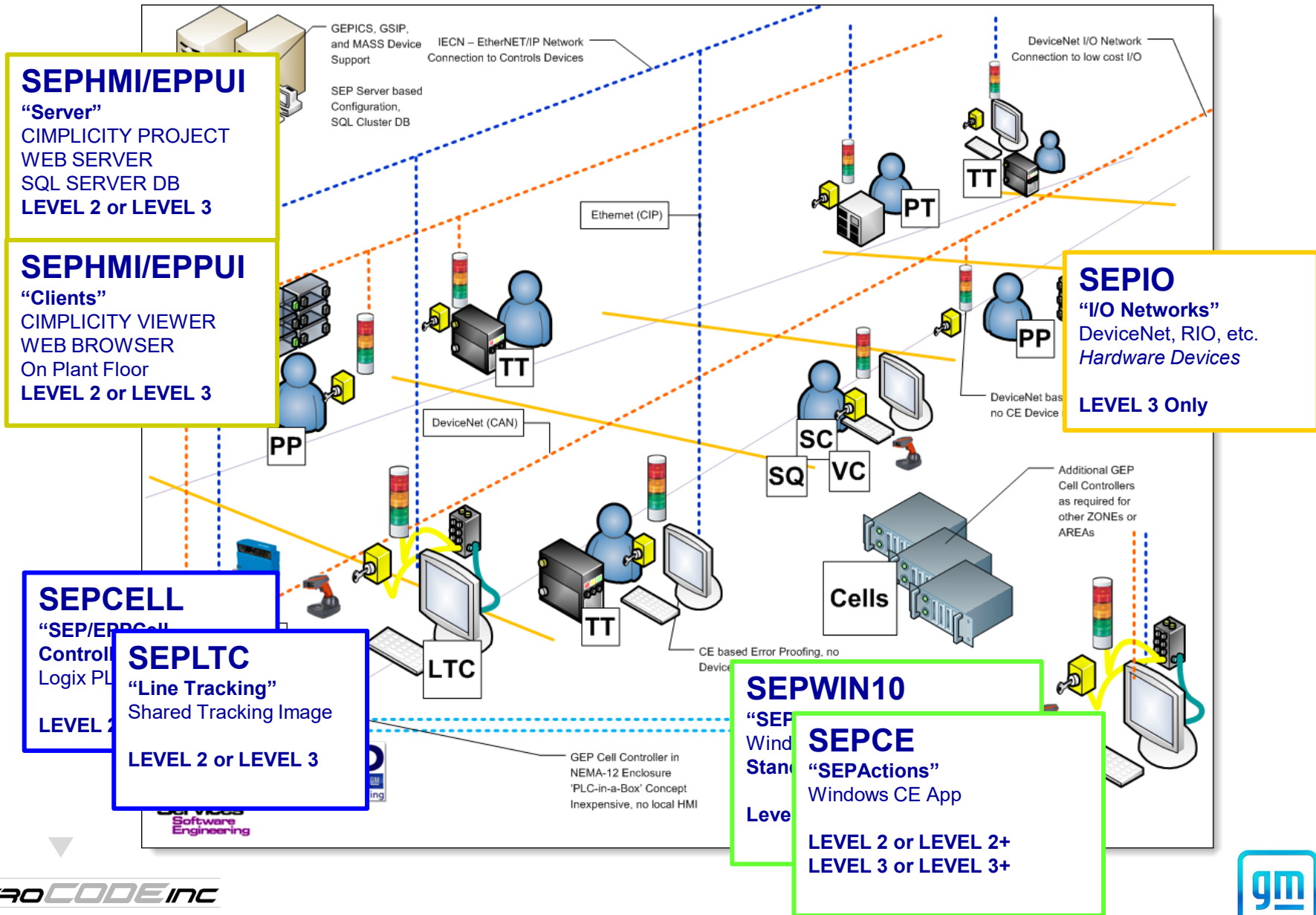
- **SEP/EPP Server** = A Windows Server with SQL Server database, Rockwell RSLinx communication software, GE Fanuc CIMPLICITY HMI software, and SEP/EPP Application components.
- **SEP/EPP Cell Controller** = An Allen-Bradley Logix 5000 Chassis, Power Supply, PLCs, and Interfaces Cards in an enclosure on the plant floor.
- **Tin Can** = “NEMA-12 / PanelView 600 LTC” the original COSS Line Tracking Console (LTC) Device from 15 years ago, *replaced by...*
- **CE Station** = “Black Stand”, “EPC”, “LTC”, a black metal stand with: Windows CE computer, LCD Monitor, Keyboard, Mouse, Hand Scanner, Local Ethernet I/O, Light Stack, and Bypass/Release Keyswitch.

Hardware components used for Error Proofing...

- **O.I.** = Operator Interface, also called SOI (Single), DOI (Double)... includes an I/O Module, Light Stack, and Bypass/Release Keyswitch.
- **I/O** = any I/O module which connects sensors to the SEP/EPP Cell Controllers or CE Stations.
- **Light Stack** = a Traffic Light with a Horn.
- **Bypass/Release Keyswitch** = a three (3) position keyswitch.
 - 1) Center (spring return) – Run error proofing
 - 2) Right (momentary) – Release a single Vehicle from error proofing
 - 3) Left (maintained) – Bypass error proofing for all Vehicles

Note: Only Team Leaders and Group Leaders have B/R Keys on the floor... normally.





Software components used for Error Proofing...

- **CIMPLICITY Project** = “SEP/EPP HMI”, loaded on the SEP/EPP Server and SEP/EPP Clients (HMIs/UIs) throughout the plant. Common Code. Not modified.
- **GMP, GXP** = Two Allen-Bradley Logix 5000 PLC programs loaded into a Cell Controller. Common Code. Not modified.
- **Console** = “GEP Console” a CE App loaded into a ‘CE Station’, a PV600 emulator that replaced the ‘Tin Cans’ – now replaced by SEPActions SEP App (LTC Action).
- **Sequence** = “GEP Sequence” a CE App loaded into a ‘CE Station’, , a ‘Level 2’ application for sequencing and kitting, i.e.: Part Picks and Scans. Currently there is no SEPActions equivalent.
- **Actions** = “SEPActions” a CE App loaded into a ‘CE Station’, designed as a scalable alternative to all software components in GEP
 - ▼ except for a shared tracking image.

Software components used for Error Proofing...

- **Conveyor Driver** = PLC-5, Logix 5000, or custom PLC subroutine(s) place in a Conveyor PLC to provide tracking information to an SEP/EPP Cell Controller.
- **Process Tool Driver** = PLC-5, Logix 5000, or custom PLC subroutine(s) place in a Process Tool PLC to provide equipment status to an SEP/EPP Cell Controller.
- **Deployment Tools** = VB Apps, Excel/VBA Tools, C# Apps, Access Tools.



External GM Systems that SEP/EPP connects to...

- **GEPICS = Global Enterprise Production Information Control System**, the customer order system as seen by the manufacturing plants, controls Vehicle build order and receives vehicle status.
- **GSIP = Global Standardized Inspection Process**, controls the tracking of Vehicle quality, receives defects on vehicles from various sources.
- **GPM&C = Global Plant Monitoring and Control**, a central collection of all plant floor manufacturing systems status, alarms, and data; receives status, counts, alarms and other data from various sources.
- **QAS = Quality Andon System**, “Andon” means lantern in Japanese, provides a common means for Operators and Systems to stop Production for defects before they leave a Station, Footprint, or Area.



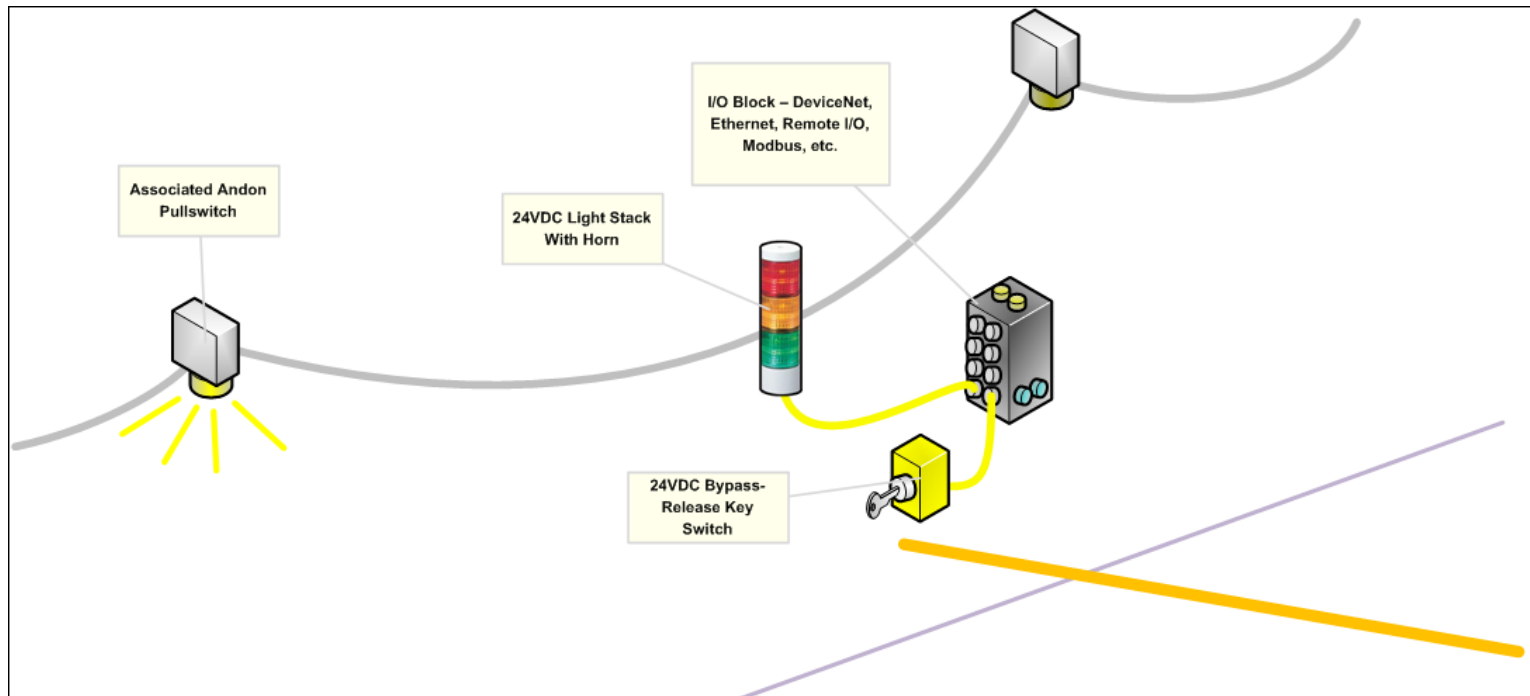
Acronyms used for Error Proofing Action types (Task Types)...

- **EPA** = Error Proofing Action, generic type for any type
- **LTC** = Line Tracking Console... sensing Vehicle entry and movement
- **TT** = Torque Tool, also called an ‘SSE’ (Single Spindle Electric), ‘Nut Runner’, ‘Electric Tool’, ‘Electric Gun’... these sense the Operator tightening Fasteners on the Vehicle or Sub-Assembly.
- **SC** = Scan Component, also called ‘Part Scan’, ‘Scanners’, ‘Trace Stations’... these sense an Operator scanning a barcode on a selected Part for install on the Vehicle.
- **PP** = Part Pick, also called ‘Light Screens’, ‘Hoppers’, ‘Bins’, ‘Acknowledge Lights’, ‘Acknowledge Buttons’... these sense the Operator picking up optional Parts for the Vehicle.
- **PT** = Process Tool, also called by their specific names, like “Fluid Fill”, ‘Glass Cell’, ‘Fuel Fill’, ‘Body Marriage’, etc.... These sense a remote equipment controller completing a process on the Vehicle.



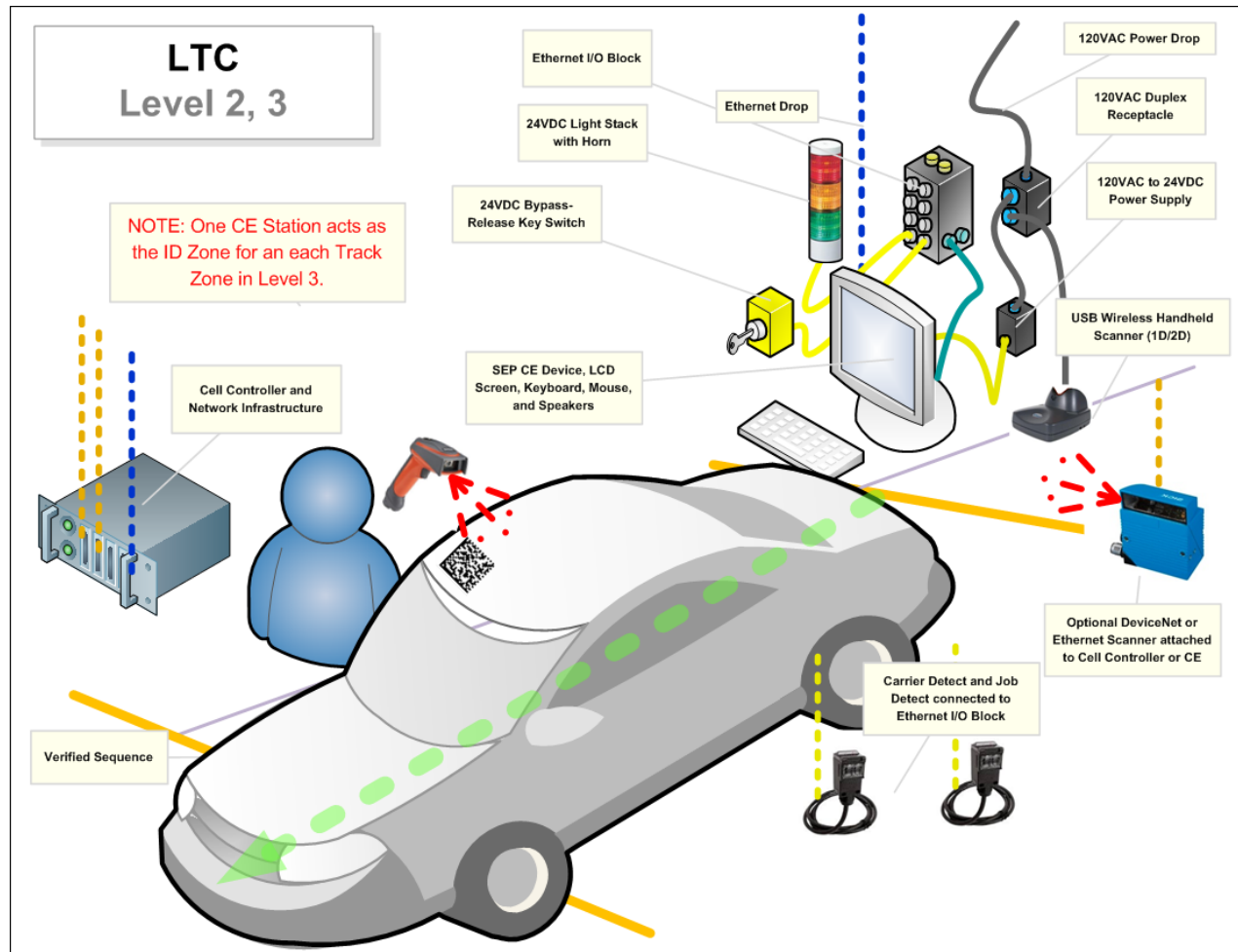
Common to any EPA Type...

- **Software** = Configuration in SEPHMI or SEPCE App, GSIP, GEPICS, and GPM&C.
- **Hardware** = I/O Module, Light Stack, and Bypass/Release Key, Andon.



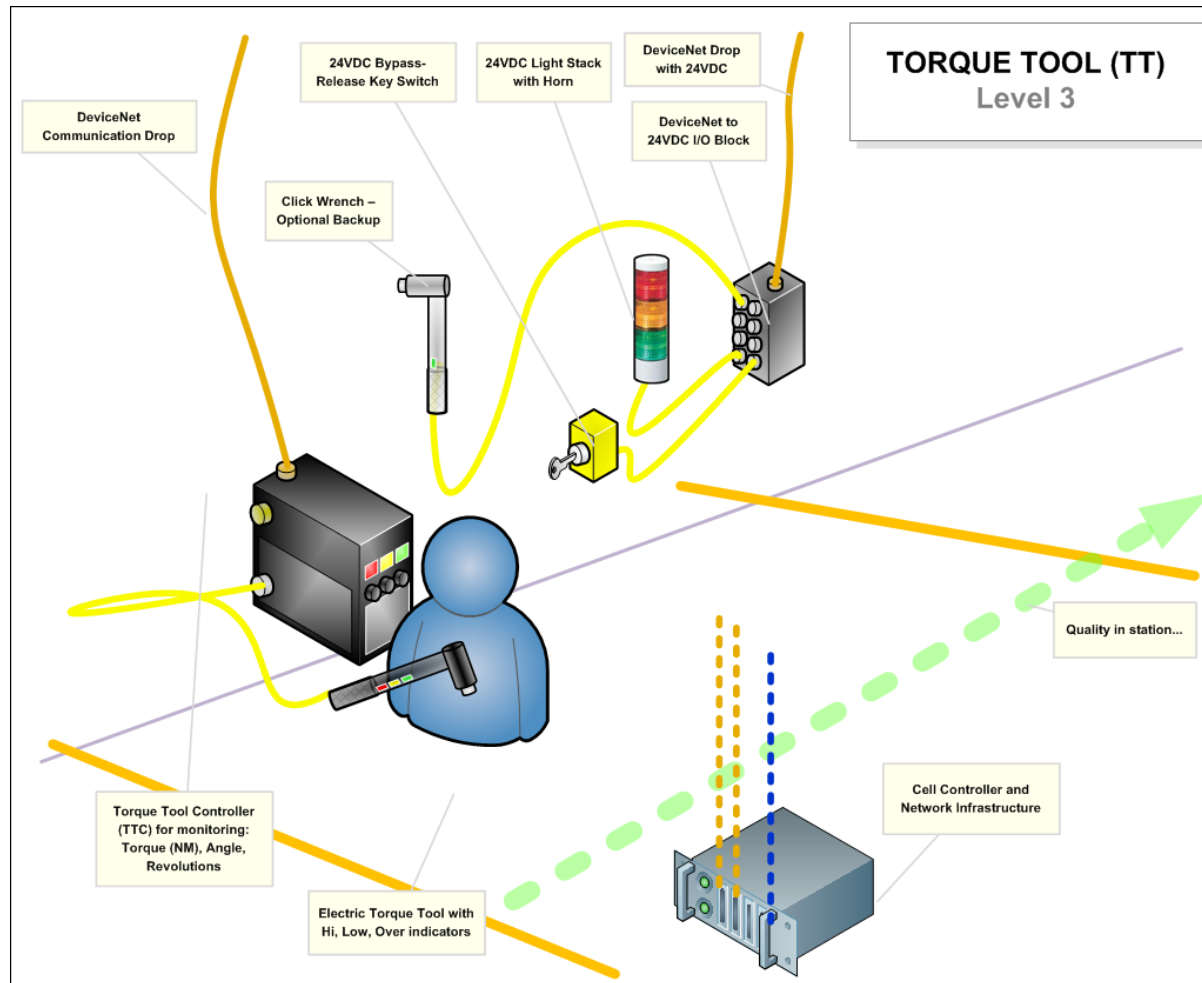
Line Tracking Console

- **Software** = Scanner (SCN) Configuration.
- **Hardware** = CE Station, Job Detect, Carrier Detect, Scanner(s).



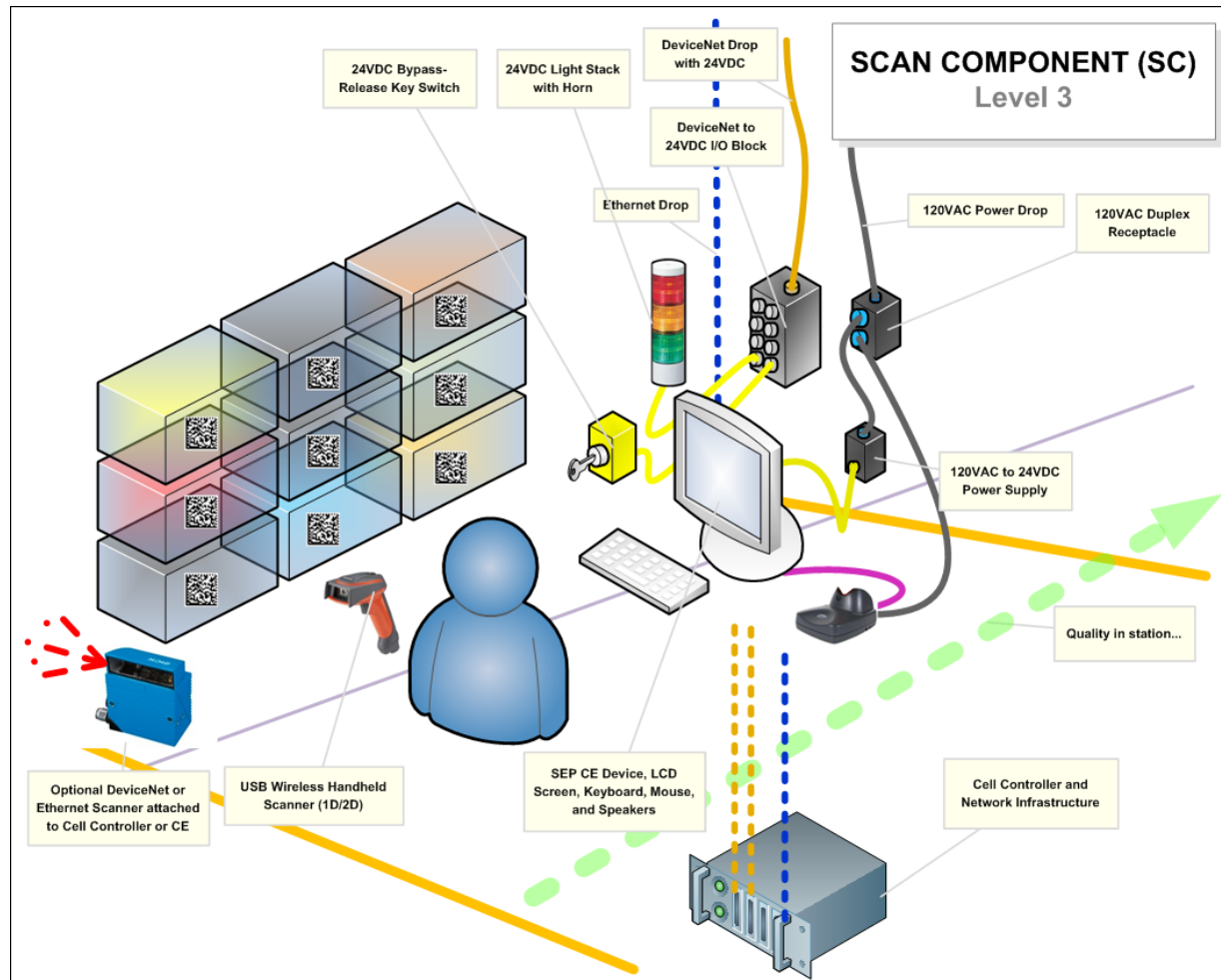
Torque Tool

- **Software** = Torque Tool Controller (TTC) Configuration.
- **Hardware** = TTC, optional Click Wrenches (CWR).



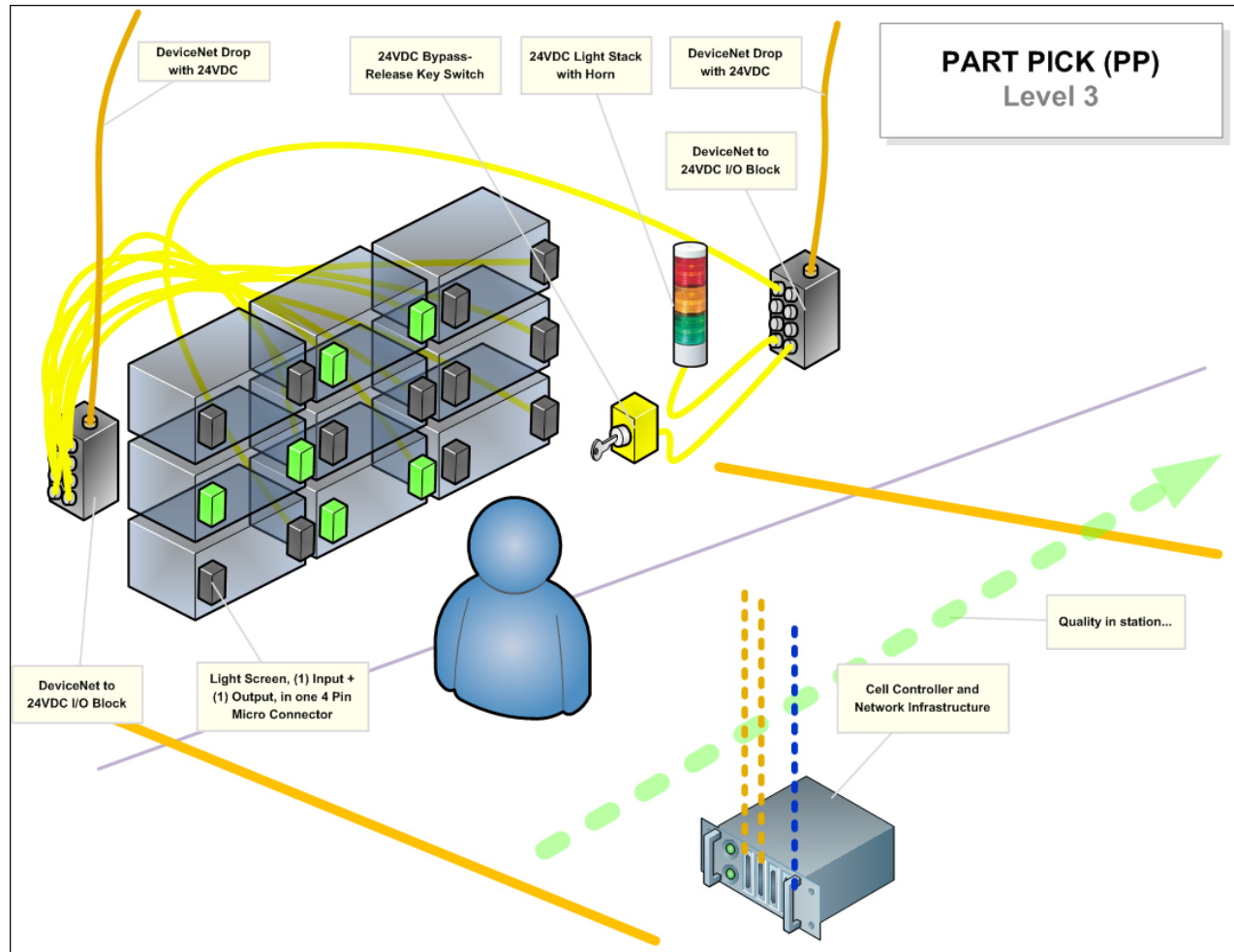
Scan Component

- **Software** = Scanner (SCN) Configuration.
- **Hardware** = CE Station, Scanner(s).



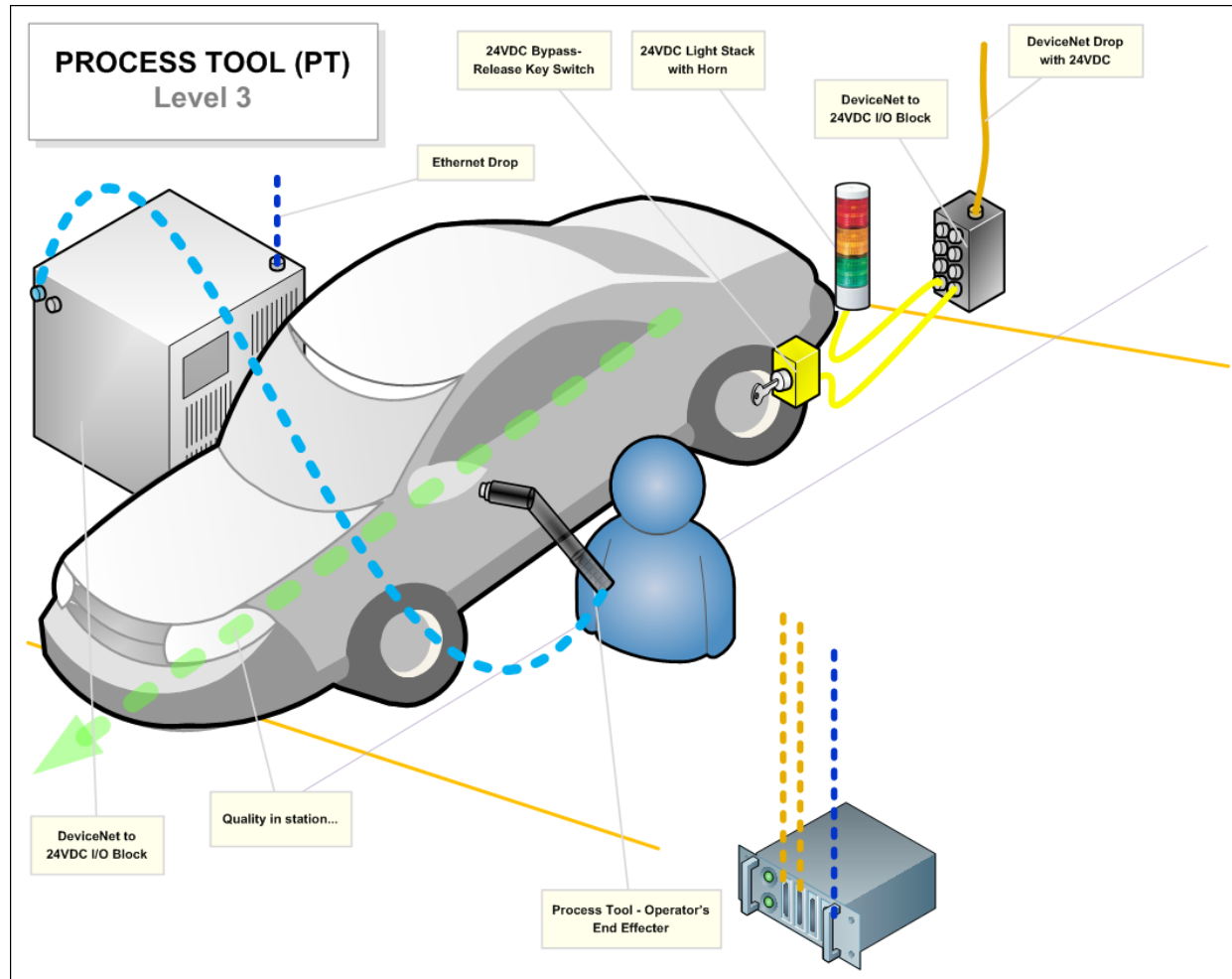
Part Pick

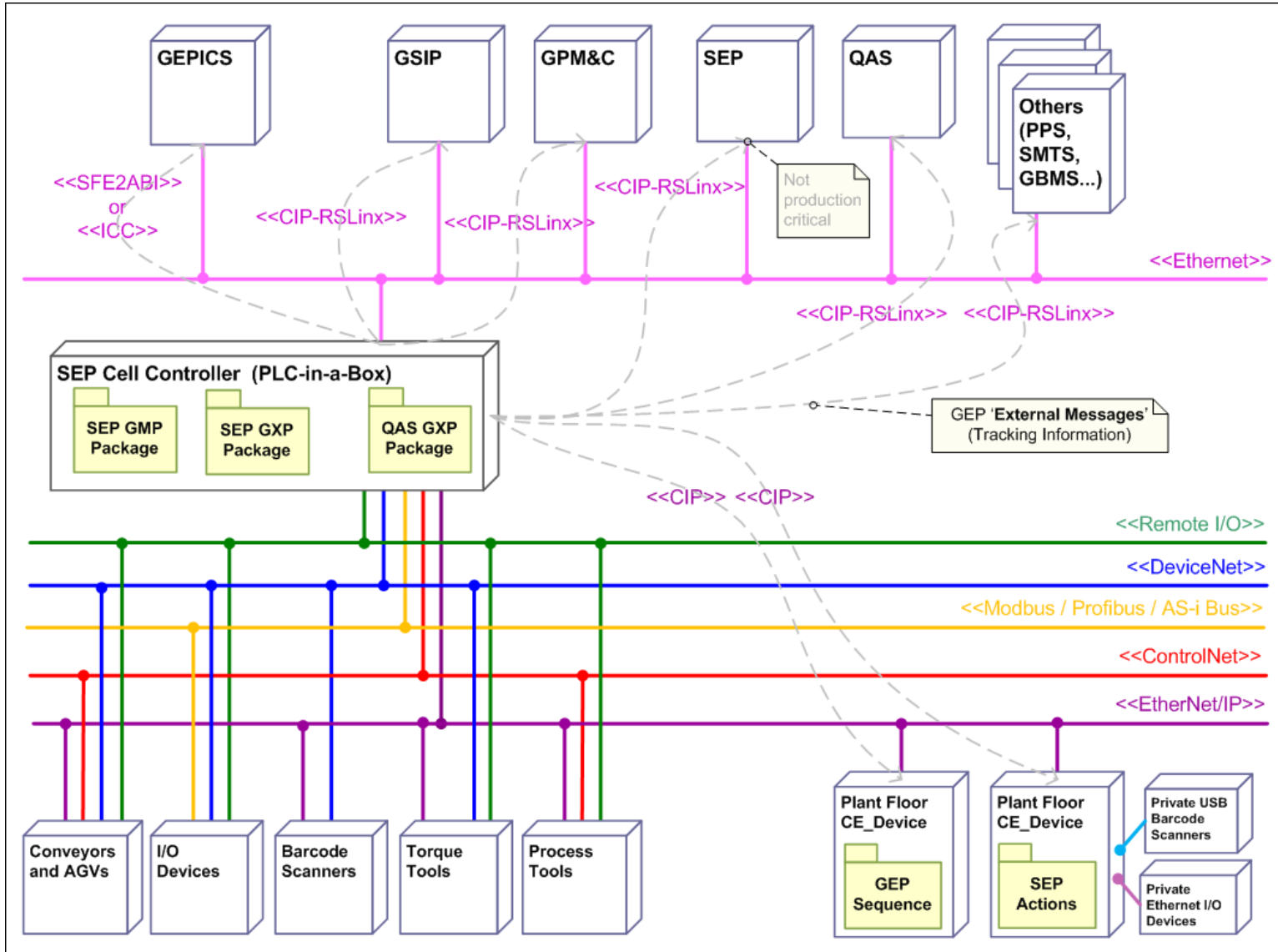
- **Software** = Sensor Configuration.
- **Hardware** = Sensor(s).



Process Tool

- **Software** = Process Tool Driver Install & Configuration.
- **Hardware** = Process Tool PLC.





Deployment Overview

Overview of the planning, configuration, installation, and testing of all this equipment...

- **WITS** – Workstation Installation Tracking Sheet
- **ETS** – EPA Tracking Sheet (was Excel, now an Access Database)
- **CFG** – Configuration of SEP/EPP, GSIP, GEPICS, QAS
- **HW** – Installation of all Hardware
- **SAT** – System Acceptance Test
- **UAT** – User Acceptance Test

SEP/EPP Standardized Work

- **WITS** (the latest) → **ETS** -- ALL DATA, ADDs, DELETES, RELOCATES, MODIFIES, with Modification Tag in the History Tab.
- **SCRUBs** (the latest) → **ETS** -- ALL DATA, ADDs, DELETES, RELOCATES, MODIFIES, with Modification Tag in the History Tab.
- **ETS** → **SEP/EPPSQL Database** – 1) ADDs, 2) RELOCATES, 3) DELETES, 4) MODIFIES... in this order whenever possible.
- **SEP/EPP SQL** → Deployment Sheets (**DPS**) into the field as soon the area has installation or re-install in process.
- **SEP/EPP SQL** (or ETS for CEs) → **TAGs** after hardware install is complete and is 'SAT Ready'
- **SATs**

Please follow this process so that the ETS always represents the complete picture of what you are going to do to any Area of the Plant before you start editing the SEP/EPP SQL Database.

Workstation Installation Tracking Sheet...

- **Excel Spreadsheet → now Access Database**
- **Collection of Information** from Industrial Engineers (IEs), Manufacturing Engineers (MEs), VS Assembly Engineers, etc.

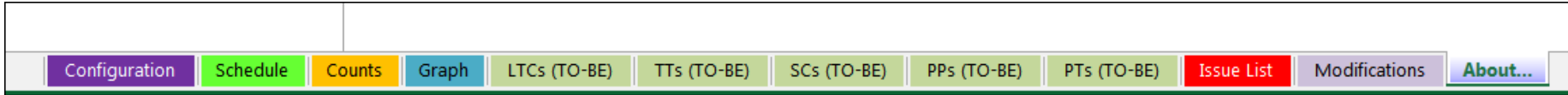
Workstation Installation Tracking Sheet (WITS)											Plant: LORDSTOWN	
Station Information						Item Information						
Sort No.	Item No.	AREA	Work Type	Current Location	New Location	Item Category	SEP EPA Type	Disable Line Stop?	Item Description	SOR Section	PAD Description Part Noun Name(s)	MP
		IP	NEW		17-IP-007L	TORQUE CONTROLLER / STAND			TORQUE MONITOR WITH STAND			
		IP	NEW		17-IP-007L	ERROR PROOFING	SC - Scan Trace Data		ADD STEERING COLUMN SCANNER TETHERED ON BALANCER			
		IP			17-IP-007R	OPEN			OPEN			
		IP			17-IP-008L				KPC CHECK			
		IP			17-IP-008R				NON-WORKABLE			
		IP			17-IP-009L				AIR DUCT			
		IP	NEW		17-IP-009L	LMS CART			ADD LEFT SIDE AIR DUCT, RIGHT SIDE AIR DUCT, AND HORSE COLLAR & ADD HVAC HOSE			
		IP	NEW		17-IP-009L	SINGLE SPINDLE AIR			ADD SSA-509 TO SECURE RT HAND AIR DUCT BOLT		BOLT/SCREW - FLR FRT AIR OTLT DUCT	5491
		IP			17-IP-009L	TRAVEL TRAY			TRAVEL TRAY			
		IP			17-IP-009R				NON-WORKABLE			
		IP			17-IP-010L				RETAINER #1 & #3			
		IP			17-IP-010R				NON-WORKABLE			

EPA Tracking Sheet...

- Excel Spreadsheet
- Extraction of Information from the WITS
- Hardware Configuration from SEPHMI
- GSIP Machine Codes from Plant Quality Department

	A	B	C	D	E	F	G	H	I	J	
	1	2	3	4	5	6	7	8	9	10	
2	Get TTs	Columns	CHANGE Sort	GSIP	ULOC (TO-BE)				Install/Planning Config		
3	Deploy Sheet	Add Row	Last Modification	QUALITY Assigned Machine Code (TO-BE)	Target Department	Target Section	Target Footprint / Operation (IE)	Target Address (IE)	View Control		
	Sort	Del Row								Select the View you want for performing data entry or review... <input checked="" type="radio"/> ALL - Show all data in each sheet <input type="radio"/> WITS - Data Entry <input type="radio"/> CFG - SEP Configuration <input type="radio"/> HW - Hardware Install <input type="radio"/> SAT - System Acceptance Tests <input type="radio"/> UAT - User Acceptance Tests	
	Launch Phase	Request Type									
9	CONC-D1-D2	Add			2014-11-25:SUZY=11/25/2014 TJM	0	25	A1	005	R	
10	CONC-D1-D2	Add			2014-11-17:SUZY=10/27/2014 TJM	0	25	A1	006	L	
11	CONC-D1-D2	Add			2014-11-18:WITS=11/16/2014 TJM	0	25	A1	008	R	
12	CONC-D1-D2	Add			2014-11-25:SUZY=11/25/2014 TJM	0	25	A1	170	L	
13	CONC-D1-D2	Add			2014-11-25:SUZY=11/25/2014 TJM	0	25	A1	170	R	
14	CONC-D1-D2	Add	2014-11-25:SUZY=11/25/2014 TJM	0	25	A1	171	L			
15	CONC-D1-D2	Add	2014-11-18:WITS=11/16/2014 TJM	0	25	A1	171	L			
16	CONC-D1-D2	Behavior	2014-11-25:SUZY=11/25/2014 TJM	0	25	A1	171	L			
17	CONC-D1-D2	Add	2014-11-25:SUZY=11/25/2014 TJM	0	25	A1	171	R			
18	CONC-D1-D2	Behavior	2014-11-25:SUZY=11/25/2014 TJM	0	25	A1	171	R			

EPA Tracking Sheet...



- **Configuration** controls what the ETS is being used for
- **Schedule** gives a status report and automatically schedules SATs
- **Counts** shows quantities of each EPA
- **Graph** shows chart of current deployment status
- **TO-BE** tabs are used to gather information and keep track of progress
- **Issues List** for SEP/EPPrelated deployment issues
- **Modifications** is a coded history of where the information in the ETS came from, and acts as a pull-down menu
- **About** has history of ETS and commands for controlling its use

SEP/EPP HMI/UI Configuration Mode...

- **I/O Connections** – the hardware being used by the EPAs
- **Actions** – the EPAs themselves

The screenshot displays the SEP Configuration HMI interface. At the top, the title bar reads "GM SEP Configuration" with the date "12/03/14" and time "19:14:31". Below the title bar, there are navigation buttons (PgBack, Home, PgForw) and status information including "GEP_Config (Ver 2.1.0)", "SEPPROJECT", and "DB ver SEP 1.0.5 (HMI 2.1.0) SP1".

The main interface features several panels:

- SEP Panel:** 1 - CHASSIS
- SEP Cell:** 0 - AGV
- Conveyors:** A1
- Track Zone:** 0 - TZ_AGV
- Foot Prints:** 18
- Messages:** 10

Below these panels are buttons for PP, TT, PT, SC, VS, VC, and CE, along with a Notification area.

The left side of the interface shows "I/O Connections" and "Actions" for the "Left Side" and "Right Side". The "Left Side" section includes a grid of I/O connections and two action buttons labeled SC and TT. The "Right Side" section includes a grid of I/O connections and two action buttons labeled PP and TT.

A configuration window titled "Error Proof Fastening (EPF) on Left Side - (D2LC - LH FRONT KNUCKLE SECURE [CSSE-015]) (P1C0)" is open in the foreground. This window contains the following configuration details:

- Description:** D2LC - LH FRONT KNUCKLE SECURE [CSSE-015]
- Track Zone (TZNI):** 0, "TZ_AGV", Enable GSIP Events, Machine Code: 32767
- Footprint (FTP):** 8, 25-A1-006, L, Source: TORAGV
- Action (ACT):** 3, 67, 16 (EPAid), Enable QAS Events, Andon Index: 5
- Action PWP:** 70, Quality Pass, SAT Completed

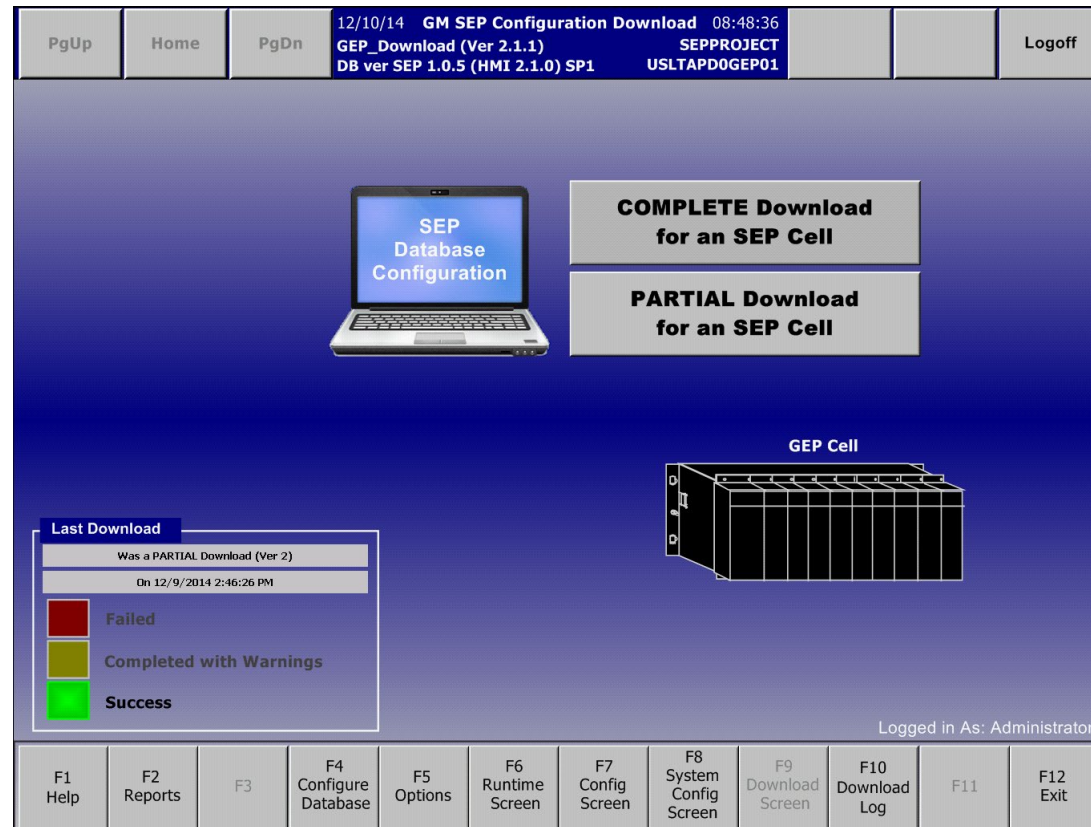
The "Error Proof Fastening (EPF) Action Options" section includes:

- Use following in GEP O.I. LEDs
- PVI/PONO
- CSN
- Part No.
- Connect this Action to Off-Line Tool
- Tie this Action to Action
- Ordered Execution (Execute After)
- Disable this Action Completely
- Always Execute this Action
- Sound 3-Sec horn on DONE condition
- Stop For No Build Jobs
- Force Errors to Warning Point
- Require Release Key to Restart Conveyor after Done

At the bottom of the configuration window are buttons for OK, Cancel, and Delete.

SEP/EPPHMI Configuration Download...

- **COMPLETE** – often called a ‘FULL’ Download, complete replacement of all configuration data in the Cell Controller PLC(s)
- **PARTIAL** – an update of the existing PLC configuration with changes since the last COMPLETE Download



12/10/14 GM SEP Configuration Download 08:48:36
 GEP_Download (Ver 2.1.1) SEPPROJECT
 DB ver SEP 1.0.5 (HMI 2.1.0) SP1 USLTAP0GEP01

PgUp Home PgDn Logoff

SEP Database Configuration

COMPLETE Download for an SEP Cell

PARTIAL Download for an SEP Cell

GEP Cell

Last Download

Was a PARTIAL Download (Ver 2)

On 12/9/2014 2:46:26 PM

Failed

Completed with Warnings

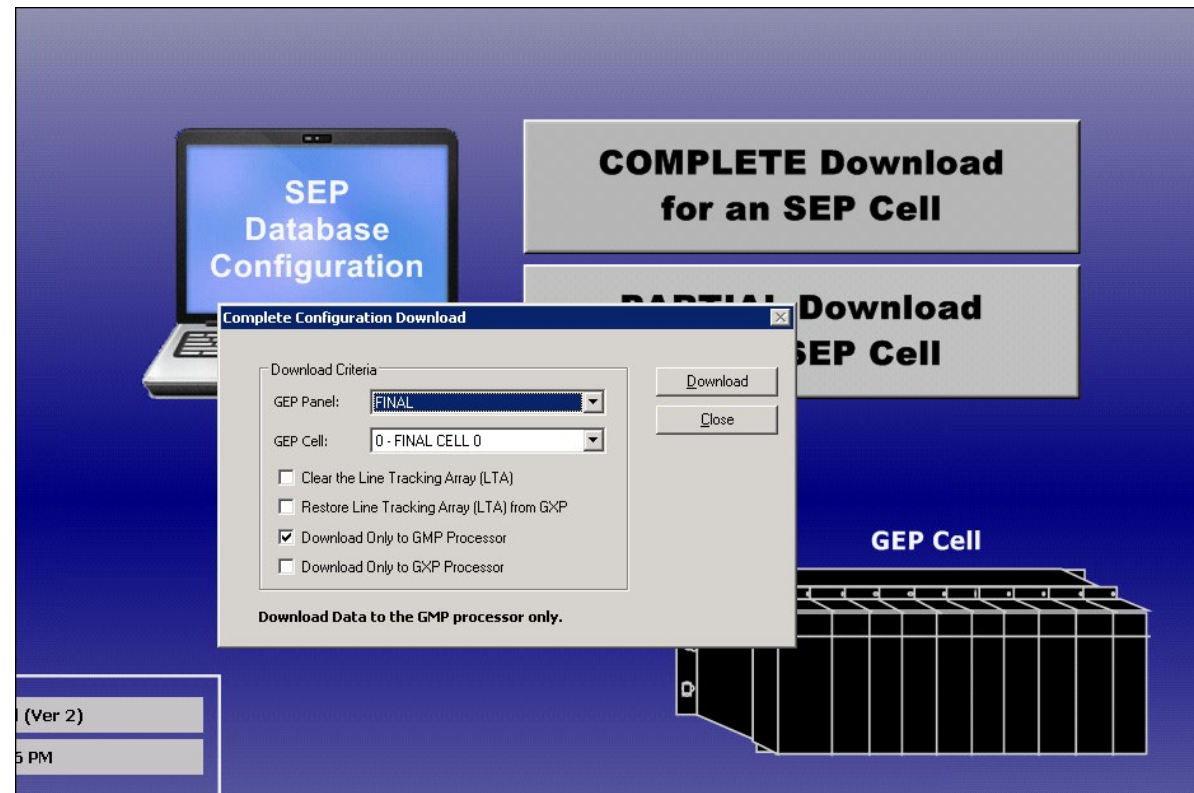
Success

Logged in As: Administrator

F1 Help F2 Reports F3 F4 Configure Database F5 Options F6 Runtime Screen F7 Config Screen F8 System Config Screen F9 Download Screen F10 Download Log F11 F12 Exit

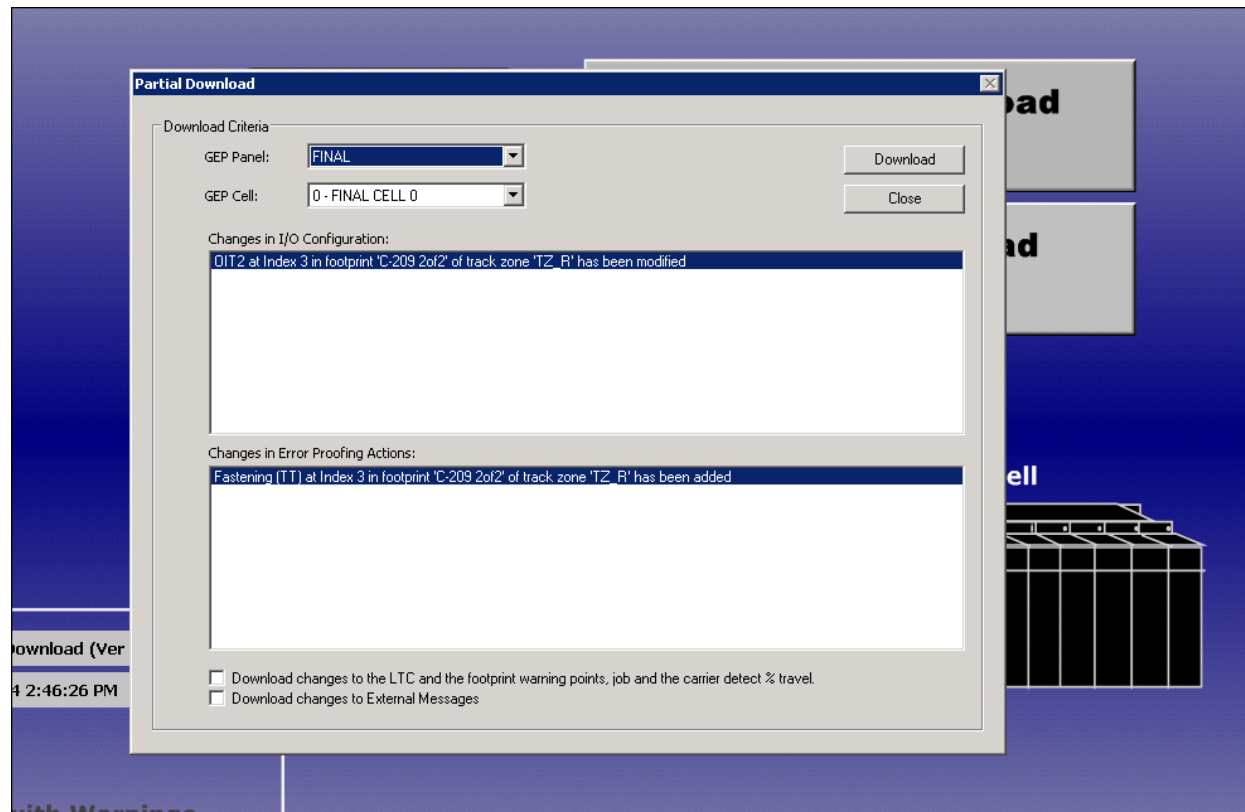
SEP/EPPHMI COMPLETE Download...

- **COMPLETE Download** – can only be performed when no Conveyor is running, i.e.: Non-Production time, Lunch, Break, or between Shifts.
- **Takes 15 – 25 minutes** and must be completed before the Plant can run again.



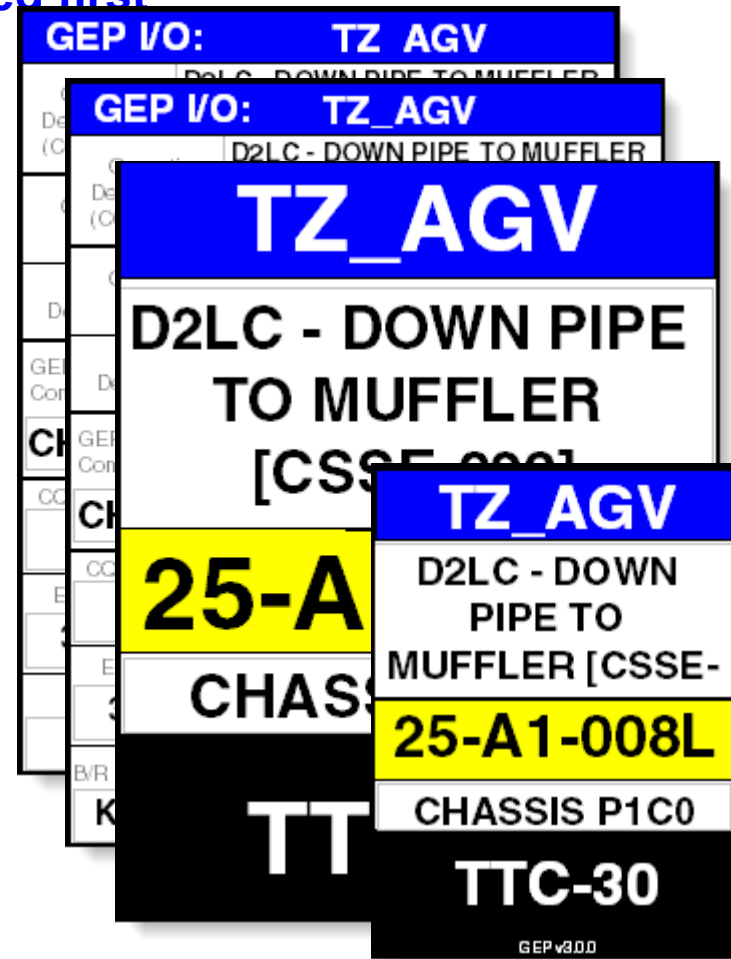
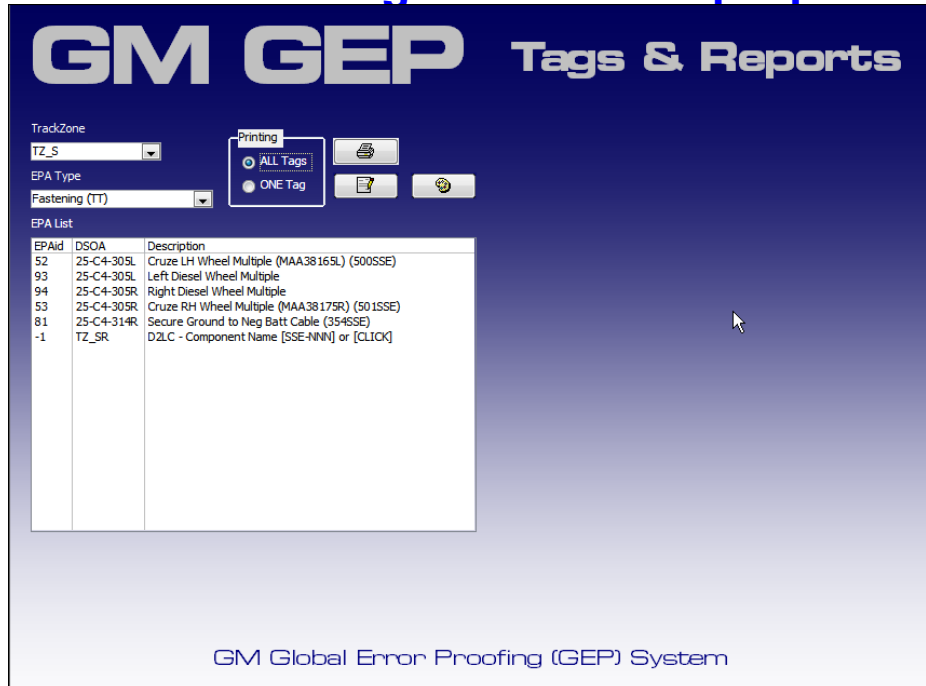
SEP/EPPHMI PARTIAL Download...

- **PARTIAL Download** – can be performed at any time, **should** be performed in coordination with Production between Jobs.
- Time taken is based on the number of changes being downloaded, changes only effect the objects being updated.



SEP/EPPTagging Microsoft Access Tool: **GMGEP TAGs & SAT Forms.mdb**

- Connects to SEP/EPPServer SQL Database
- I/O and Actions must be configured first
- Prints tags for various purposes



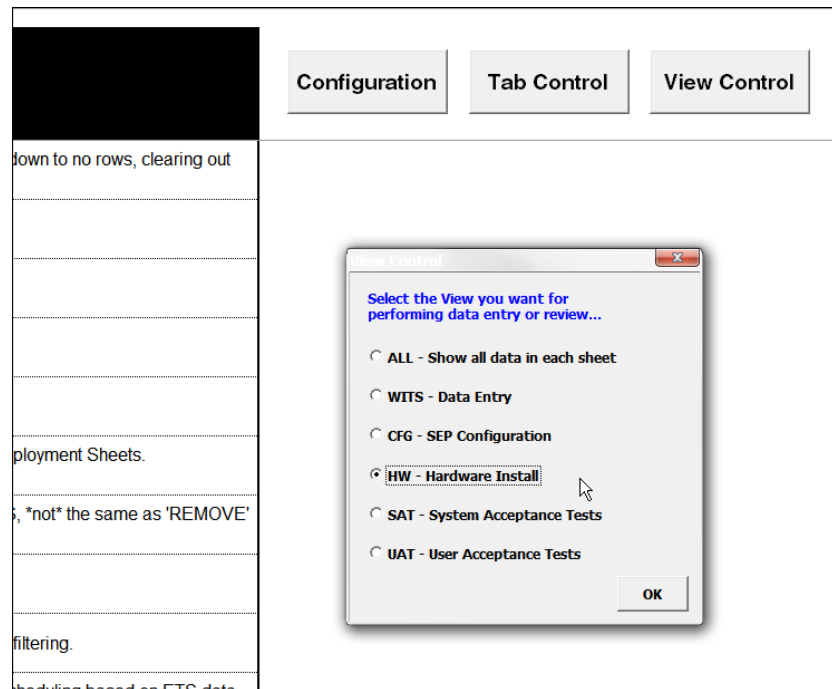
SEP/EPP Tagging Microsoft Access Tool: **GMGEP TAGs & SAT Forms.mdb**

- **Rule #1:** All I/O Devices must be Tagged
- **Rule #2:** Light Stack and Keyswitch are only tagged if they are not mounted directly to the I/O Module 'Blue' Plate
- **Rule #3:** Use common sense, don't waste time hanging redundant Tags, these lead to confusion later as well

TZ_AGV	TZ_AGV	TZ_AGV	TZ_AGV
D2LC - DOWN PIPE TO MUFFLER [CSSE-023]	D2LC - DOWN PIPE TO MUFFLER [CSSE-023]	D2LC - DOWN PIPE TO MUFFLER [CSSE-023]	D2LC - DOWN PIPE TO MUFFLER [CSSE-023]
25-A1-008L	25-A1-008L	25-A1-008L	25-A1-008L
CHASSIS - AGV	CHASSIS - AGV	CHASSIS - AGV	CHASSIS - AGV
TTC-30 <small>GEP#000</small>	TTC-30 <small>GEP#000</small>	TTC-30 <small>GEP#000</small>	TTC-30 <small>GEP#000</small>
TZ_AGV	TZ_AGV	GEP I/O: TZ_AGV	GEP I/O: TZ_AGV
D2LC - DOWN PIPE TO MUFFLER [CSSE-023]	D2LC - DOWN PIPE TO MUFFLER [CSSE-023]	D2LC - DOWN PIPE TO MUFFLER [CSSE-023]	D2LC - DOWN PIPE TO MUFFLER [CSSE-023]
Operation (uLoc):	Operation (uLoc):	25-A1-008L	25-A1-008L
I/O Description:	I/O Description:	DeviceNet I/O (DIO) - SSTX - DOWN PIPE TO MUFFLER [CSSE-023]	DeviceNet I/O (DIO) - OIT2 - DOWN PIPE TO MUFFLER [CSSE-023]
GEP Call Controller: P1 C0	GEP Call Controller: P1 C0	P1 C0 VNet: 8 VNode: 53	P1 C0 VNet: 8 VNode: 18
TTC-30 <small>GEP#000</small>	TTC-30 <small>GEP#000</small>	CHASSIS <small>MM: 8 Node: 53</small>	CHASSIS <small>MM: 8 Node: 18</small>
		TT-30 <small>GEP#000</small>	TT-30 <small>GEP#000</small>

Hardware Installation...

- Performed by **Plant Skilled Trades** or **Outside Contractors**
- **Single EPAs** – can be installed between Shifts, on Weekends, or even during Lunch Breaks.
- **Network Changes** should only be done on Weekends or during Shutdown periods



Hardware Installation...

- Deployment Sheets to aid in hardware install
- Provides a sanity check for the hardware installer
- Provides I/O addresses for hardware installer

Torque Tool - Deployment Sheet																																								
TO-BE Description:	RH STABILIZER SHAFT AT STRUT																																							
AS-IS Description:	D2LC - RH STABILIZER SHAFT AT STRUT																																							
Tool Number, Spindles:	CSSE-145 , 1																																							
PSETs, Rundowns:	1 , 1																																							
TTC TCP/IP Address:	120.27.255.98																																							
Request Type:	Add																																							
Current Status:	CONFIGURED																																							
	<table border="1"> <thead> <tr> <th></th> <th>TO-BE</th> <th>AS-IS</th> </tr> </thead> <tbody> <tr> <td>GSIP Machine Code:</td> <td>31091</td> <td>31091</td> </tr> <tr> <td>Track Zone:</td> <td>Y</td> <td>TZ_R</td> </tr> <tr> <td>DSOA:</td> <td>25-C2-205R</td> <td>25-C2-205R</td> </tr> <tr> <td>O.I. Node Light Stack + Key</td> <td>O.I.</td> <td>O.I.</td> </tr> <tr> <td>Network No.</td> <td>14</td> <td>14</td> </tr> <tr> <td>Node No.</td> <td>12</td> <td>12</td> </tr> <tr> <td>Torque Tool Controller</td> <td>TTC</td> <td>TTC</td> </tr> <tr> <td>Network No.</td> <td>14</td> <td>14</td> </tr> <tr> <td>Node No.</td> <td>52</td> <td>52</td> </tr> <tr> <td>Click Wrenches</td> <td>CWR</td> <td>CWR</td> </tr> <tr> <td>Network No.</td> <td></td> <td></td> </tr> <tr> <td>Node No.</td> <td></td> <td></td> </tr> </tbody> </table>		TO-BE	AS-IS	GSIP Machine Code:	31091	31091	Track Zone:	Y	TZ_R	DSOA:	25-C2-205R	25-C2-205R	O.I. Node Light Stack + Key	O.I.	O.I.	Network No.	14	14	Node No.	12	12	Torque Tool Controller	TTC	TTC	Network No.	14	14	Node No.	52	52	Click Wrenches	CWR	CWR	Network No.			Node No.		
	TO-BE	AS-IS																																						
GSIP Machine Code:	31091	31091																																						
Track Zone:	Y	TZ_R																																						
DSOA:	25-C2-205R	25-C2-205R																																						
O.I. Node Light Stack + Key	O.I.	O.I.																																						
Network No.	14	14																																						
Node No.	12	12																																						
Torque Tool Controller	TTC	TTC																																						
Network No.	14	14																																						
Node No.	52	52																																						
Click Wrenches	CWR	CWR																																						
Network No.																																								
Node No.																																								
NOTES: Double Stand location.																																								
INSTALL Instructions: Use a single Light Stack on the I/O Block, not shared with other TT in this Footprint.																																								



Hardware Installation...

- **ETS Checklist** – used to record hardware status
- **Physical Install** – Stand, Tool, I/O Nodes, Network Drops
- **Commissioning** – Node Addressing, Network Configuration

Get TTs	Columns	GSP		ULOC (TO-BE)				Install/Planning Config				Physical Install				Commissioning							
		Sort	Sort	Target Department	Target Section	Target Footprint / Operation (IE)	Target Address (IE)	EPICS	Configured	Physical	Commissioning	Ready?	Ready?	Ready?	Ready?								
Deploy Sheet	Add Row	Request Type	QUALITY Assigned Machine Code (TO-BE)	Target Department	Target Section	Target Footprint / Operation (IE)	Target Address (IE)	Relationships Configured	Physical Install				Commissioning										
SAT Form	Del Row	Request Type	Machine Code (TO-BE)	Target Department	Target Section	Target Footprint / Operation (IE)	Target Address (IE)	Relationships Configured	TTC Installed	Tool (Gun) Installed	ENET Drop	DNET Drops	O.I. Device/NetBlock Installed	Stacklight & Keyswitch	Tool Tethering Complete	TTC Programmed	O.I. Node Live on DNET	TTC Live on DNET	Sensor(s) Function	SAFETY - Yellow Tagged?	Ready For SAT	Operator Interface	Equipment Tagged
CONC-D1-D2	Add	Add	0	25	A1	005	R	TRANS MOUNT	CONFIGURED														
CONC-D1-D2	Add	Add	0	25	A1	006	L	LH FRONT KNU															
CONC-D1-D2	Add	Add	0	25	A1	006	R	RH FRONT KNU															
CONC-D1-D2	Add	Add	0	25	A1	008	L	EXHAUST SYST															
CONC-D1-D2	Add	Add	0	25	A1	170	L	LH REAR SHO															
CONC-D1-D2	Add	Add	0	25	A1	170	R	RH REAR SHO															
CONC-D1-D2	Add	Add	0	25	A1	171	L	LH DRIVETRA															
CONC-D1-D2	Behavior	Add	0	25	A1	171	L	LH DRIVETRA															
CONC-D1-D2	Add	Add	0	25	A1	171	R	RH DRIVETRA															
CONC-D1-D2	Behavior	Add	0	25	A1	171	R	RH DRIVETRA															
CONC-D1-D2	Add	Add	0	25	A1	172	L	LH REAR SUSP															
CONC-D1-D2	Add	Add	0	25	A1	172	R	RH REAR SUSP															

System Acceptance Test (SAT)...

- **Prerequisites** – Hardware Installation and Commissioning is complete
- **Equipment must be YELLOW TAGGED** by Safety

RED TAG ENG-117

DANGER! DO NOT USE EQUIPMENT INITIAL TAG

RED TAG ID.:	ENG-117
PLANT:	
DEPT. / SYSTEM:	TRIM
SUBSYSTEM / ZONE:	OSC
CELL / EQ. TYPE / STA.:	IP Build Carrier
COLUMN LOCATION:	R-40
PROJECT LEADER:	Pupino III
DATE:	12/10/2014

Responsible Project Leader: *J.P.P.*
Pupino III

APPROVED FOR POWER-ON & TESTING

UAW Safety Signature _____
Date: _____

GM Safety Signature _____
Date: _____

DO NOT USE EQUIPMENT

YELLOW TAG ENG-117

Try-Out Purposes Only "Only authorized person(s)"

TAG ID.:	ENG-117
PLANT:	
DEPT. / SYSTEM:	TRIM
SUBSYSTEM / ZONE:	OSC
CELL / EQ. TYPE / STA.:	IP Build Carrier
COLUMN LOCATION:	R-40
PROJECT LEADER:	Pupino III
DATE:	12/10/2014

Responsible *J.P.P.*
Pupino III

Safety Department

UAW Safety Signature _____
Date: _____

GM Safety Signature _____
Date: _____

EQUIPMENT POWERED ON READY FOR TRYOUT

GREEN TAG ENG-117

Safety Requirements Completed

TAG ID.:	ENG-117
PLANT:	
DEPT. / SYSTEM:	TRIM
SUBSYSTEM / ZONE:	OSC
CELL / EQ. TYPE / STA.:	IP Build Carrier
COLUMN LOCATION:	R-40
PROJECT LEADER:	Pupino III
DATE:	12/10/2014

Responsible *J.P.P.*
Pupino III

Safety Department

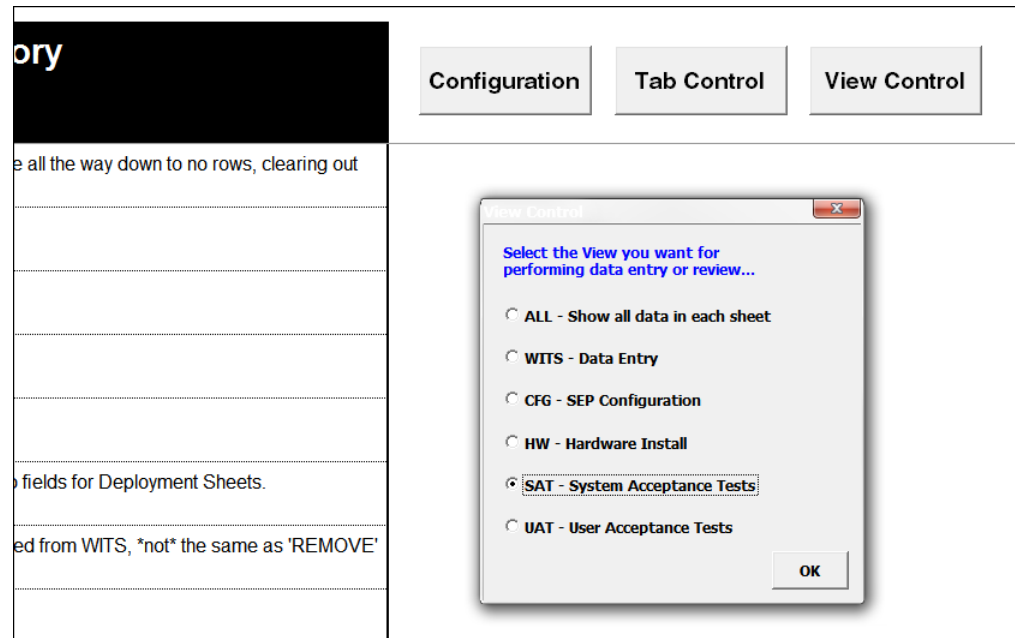
UAW Safety Signature _____
Date: _____

GM Safety Signature _____
Date: _____

EQUIPMENT READY FOR USE

System Acceptance Test (SAT)...

- **Performed by SEP/EPP Team** – GM Engineering and/or outside Contractors
- **Single EPAs** – normally handled by Plant Engineering
- **Major Product Programs** – handled by Project Launch Team and handed off to Plant Production and Plant Engineering during UATs



ory

Configuration Tab Control View Control

Select the View you want for performing data entry or review...

- ALL - Show all data in each sheet
- WITS - Data Entry
- CFG - SEP Configuration
- HW - Hardware Install
- SAT - System Acceptance Tests
- UAT - User Acceptance Tests

OK

System Acceptance Test (SAT)...

- **SAT Form** – electronic form is contained with the **ETS**
- **Print Command** – fills out form from selected ETS Row
- **Execute SAT** – fill in Names, use Checkboxes, take Notes, Print result to .PDF file and drop in GEP SHARE Drive

Get TTs	Columns	GSIP	ULOC (TO-BE)		
		QUALITY Assigned Machine Code (TO-BE)	Target Department	Target Section	Target Footprint / Operation (IE)
Deploy Sheet	Add Row	0	25	A1	005
SAT Form	Del Row	0	25	A1	006
Sort		0	25	A1	006
Launch Phase	Request Type	0	25	A1	008

GM SEP ETS - SAT Form

Torque Tool: System Acceptance Test (SAT)

DSOA: **25-E1-028R** TZ_ENGINE P0C0 **TT**

Description: **Hardware** connected to their networks (Ethernet and DeviceNet) they are tagged and match this sheet. TRUE

Equipment: **Network I/O** TTC and O.I. have proper Node Addresses and all their I/O is functional on their respective Networks. TRUE

Date: **EPA** Error Proofing Action (EPA), TTC, and O.I. respond to new Job in Footprint. Light Stack works, Bypass/Release Key works, TTC Spindles respond to ENABLE signal. TRUE

By: **QAS** Andon (Beacon, Music, and Bingo Board) responds properly as Conveyor passes EPA's Programmable Warning Point (PWP), and at when Stopped at FPS. TRUE

Task

CFG **GEPICS** Behaviors produce the proper EPA reactoins based on Vehicle Order data from GEPICS, found within the "Build Data Record" in the GMP Line Tracking Image. TRUE

Hardware **GSIP** Behaviors produce the proper GSIP Defects when the EPA is Bypassed or Released: **Bypassed, Missed, Low, High, Over, and PSC Mismatch.** TRUE

Network I/O **GPM&C** EPA Status in visible in GPM&C Screens: **Bypassed, Released, Warning@PWP, Stopped@FPS, Disabled, and I/O Fault.** TRUE

EPA **Status** Ran down test fasteners on cart. **PASSED**

12/10/2014 GMSEP-ETS (EPA Tracking Sheet) MASTER 2014-12-07.xlsm 8:38 AM