VERIFICATION STATION & ERROR PROOFING VERIFICATION

Quality & Industrial Performance version 3

"Going From Reactive to Proactive"

PSA

GROUPE

IN-PROCESS CONTROL & VERIFICATION

- **Satisfy Your Customer. . .**

Do not Accept Build Ship **a Defect!**

Solve Problems Through Teamwork!

Introduction

- **PURPOSE:**
  - Improve first time quality (FTQ) and process capability.
  - Alert team members of changes in the process and know who and when to call for help.
  - Obtain the proper support to solve problems as they occur.
  - Prevent escape of defects.
  - Engage team members in Problem Solving to meet improvement goals.
  - Ensure feedback from downstream customers

- **SCOPE:**
  - Manufacturing Operations
  - Assembly Areas
  - Anywhere 100% Inspection or containment is implemented.

- **RESPONSIBILITY:**
- Ownership
  - ✓ Manufacturing Leadership

- Support from all Manufacturing, Engineering, Materials and Quality leadership and staff

BENEFITS:

- Ultimately lowers the number of defective parts, improving the plant's first time quality, direct run and lowers costs while providing a better product to the customer.

- Establishes standard communication pathways between operations, departments, and customers.

- Increased customer satisfaction

- **Verification Station Strategy, what are we searching for?**

Item	Requirement	#Criteria	Criteria requirement
VSEP1	A system in place focuses on Building Quality in Station through prevention, detection and containment of abnormalities.	VSEP11	Verification Station strategy is defined on procedure/instruction level which contains : - selection of VS place - temporary/permanent VS - guideline for alarm limit - decision criteria to stop production is established and written on the escalation procedure. - exit criteria is defined to remove non permanent Verification Station and approved by Quality
		VSEP12	Characteristics checked 100% are defined and Verification Station is developed according to Standardized Work requirements.
		VSEP13	Customer complaints have to be always covered in verification station.
		VSEP14	All the temporary and permanent verification stations which are required by customer are implemented.
		VSEP15	Impact of VS on capacity of the line is verified.

Criteria of Requirement

Next Requirement

Description, Roles, Responsibility

VERIFICATION STATION

Definition: The system of building quality in station through prevention, detection and containment of abnormalities.

Description, Roles, Responsibility

VERIFICATION STATION (VS) DESCRIPTION:

• **A Verification Station is a process that keeps us focused on Building Quality in Station through Feedback from the process. This is achieved by:**

– A Verification Station operator reviews each part using a standardized work inspection process and gives feedback to the Team.

– 100% In-Line or End of Line testing which can be considered as part of feedback mechanism through audio/visual signals, notifies the team there is a problem. Fault codes or data such as 3 in a row, 5 in an hour, with an alarm limit goal of '1' for each as the process matures.

– The use of variable SPC charts and notification for out-of-control conditions.

Description, Roles, Responsibility

VERIFICATION STATION (VS) DESCRIPTION:

- **Functions Full Time**
  - Prevents the flow of quality discrepancies beyond the VS by detecting and   resolving issues immediately.

- **Discrepancies identified for correction**
  - Data Drives Teams in Problem Solving Process with Leadership Support

- **Performance is tracked based on internal metrics**
  - Verifies that the Verification Station is working

- **Management Process Verification**
  - VS is calibrated by "downstream" data

Description, Roles, Responsibility

VERIFICATION STATION ROLES & RESPONSIBILITIES

Verification Station Operator
- Performs quality checks.
- Reacts to nonconformance.
- Initiates escalation when alarm limits are reached.

Engineer, Supervisor, and Maintenance
- Supports the Verification Station Alarms for identified discrepancies.

Plant Manager (Manufacturing Lead Person)
- Owns the Verification Station Process.
- Develops and promotes problem solving and *Error Proofing*.
- Attends Verification Station Report Out Daily.
- Facilitates support for the team to ensure the process is working.

Quality Manager Supports
- The daily Verification Station meeting.
- Problem Solving and follow-up.

Description, Roles, Responsibility

WHAT IS THE PURPOSE OF A VERIFICATION STATION?

- Verification Stations check if your process is giving you what it was designed to give you.

- Provides the means through an alarm system to address highest   priority customer concerns (PR&R type defects).

  - It will also draw attention to the frequent, low severity non-conformances. (e.g. dirt, burns, burrs, orange peel)

- To improve the process by immediately engaging the Team in   problem solving as the defects occur.

Description, Roles, Responsibility

TEMPORARY OR PERMANENT VERIFICATION STATION?

- VS could be <u>Temporary</u> in order to contain the problem (including customer complaints) till all actions be implemented and validated or <u>Permanent</u> (high risk, high RPN, low capability due to common causes, customer requirement). In both cases, the organization shall have a procedure establishing how to define a VS.

- Exit criteria for Temporary VS must be written in the VS procedure and:
    - Include clear and measurable elements
    - Be specific and relevant to the nonconformance issues to be addressed
    - Require documentation to demonstrate corrective actions taken are permanent
    - Demonstrate that the corrective actions were effective
    - Be approved by Quality Department
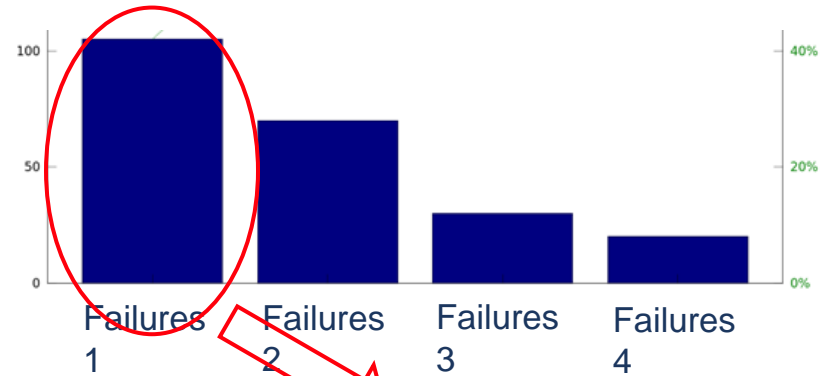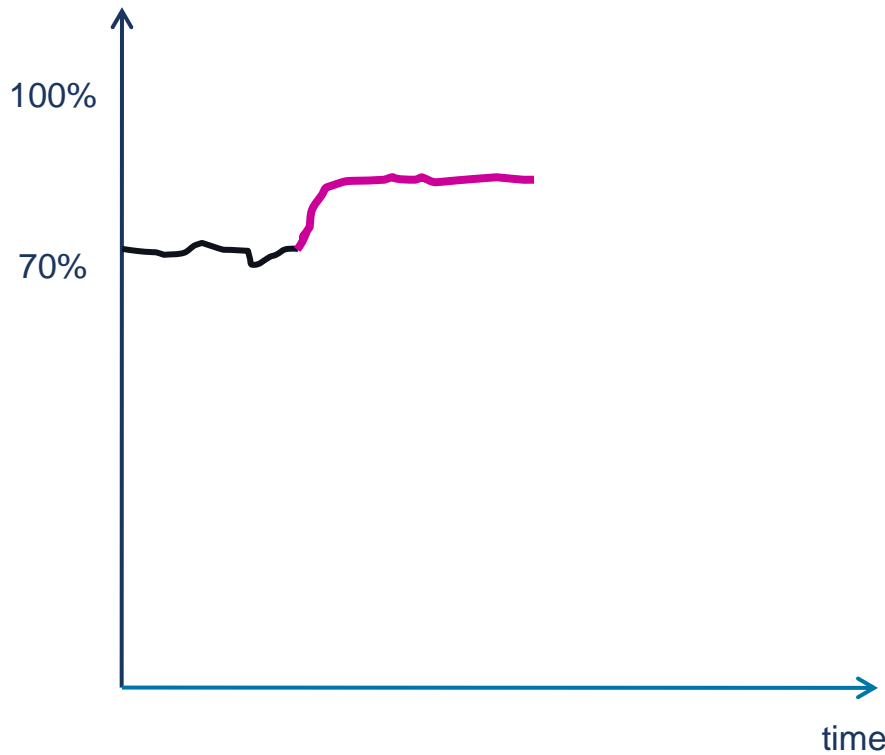
Description, Roles, Responsibility

WHERE ARE VERIFICATION STATIONS PLACED?

- Points in the process or operation where there exists:
  - High risk,
  - Poor FTQ,
  - High RPN,
  - Customer requirement/complaints,
  - Pass Through characteristics,
  - Low capability (Ppk, Cpk): Any operation related to special characteristic with Cpk or Ppk below 1.33 or standard characteristic with Cpk or Ppk below 1.00 requires 100% inspection.

- Between departments or distinct processes at point of cause.

- The potential impact of VS in the line capacity (VS Cycle Time versus Takt Time) must be verified before the implementation. Organization must assure that the process capacity won't be affected by VS through allocation of right resources (man, machine, material, method).

V.S Establishing:

First Time Quality

100%

70%

time

#	Defects	VS Alarm Trigger #	1st Hour 6:00-7:00 4:00-5:00	2nd Hour 7:00-8:00 5:00-6:00	3rd Hour 8:00-9:00 6:00-7:00
1	Failure1	3	II	I	II

OP 10 → VS → OP 20

Root Cause Analysis, Corrective Actions

Move Special Characteristics to up-front process and/or more higher risk characteristics

Customer defined Special Characteristics
Drawing / DFMEA
PFMEA / Process Control Plan

Organization defined Special Characteristics
High RPN/Severity / PRR Related
Cp/Cpk<1.33 / High fall out

Sampling inspection
With Xbar-R, Cp/Cpk, P-Chart

Enough capability

Cp/Cpk < 1.33
P-chart out of control limit?

Enough capability

Poor capability

Start Verification Station
100% inspection
With Tally sheet + Alarm limit

Poor capability

No out of Alarm limit
Cp/Cpk >= 1.33
P-chart within control limit?

Enough capability

OP 10 → OP 20 | VS (Example)

Feed Forward

OP 50 ← OP 40 ← OP 30

VS → CARE → Dock Audit

Feed Back

Warranty ← Customer ← Liaison
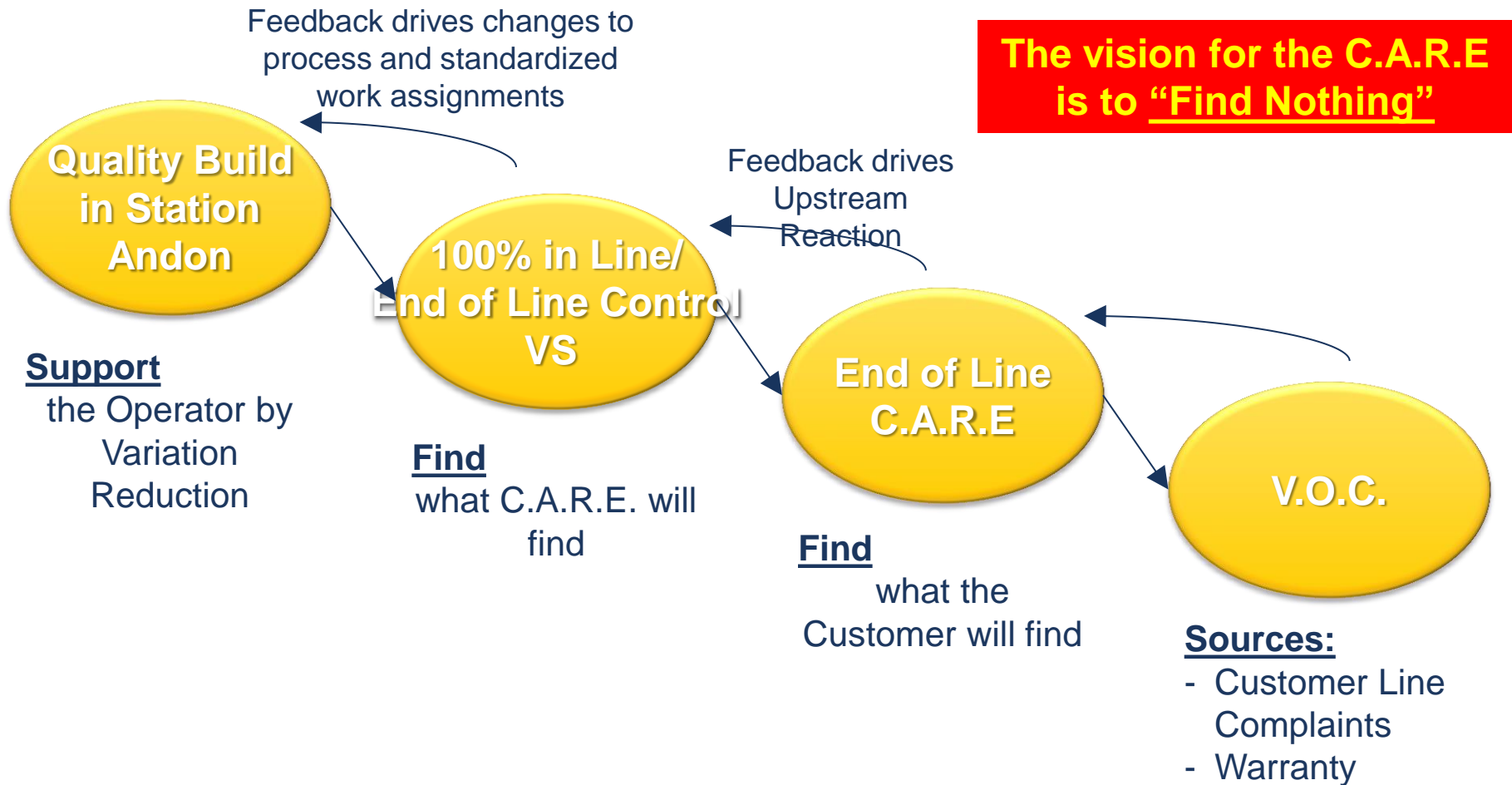
Verification Station(s) can be placed anywhere in the process.
Alarm & Escalation should be applied to each step in the process.

Feedback and Feedforward Relationship (Example)

Feedback drives changes to process and standardized work assignments

The vision for the C.A.R.E is to "Find Nothing"

Quality Build in Station Andon

100% in Line/ End of Line Control VS

Feedback drives Upstream Reaction

End of Line C.A.R.E

V.O.C.

Support
the Operator by Variation Reduction

Find
what C.A.R.E. will find

Find
what the Customer will find

Sources:
- Customer Line Complaints
- Warranty

- **C.A.R.E**

  CUSTOMER **A**CCEPTANCE **R**EVIEW & **E**VALUATION

  - Protects your customer from non-conforming product, discrepancies and labeling errors.

  - Verifies that process controls are effective.

  - Applies to customer satisfaction items that are part related.
    - Pass Through Characteristics
    - Labeling
    - Past Formal Customer Issues
    - High RPN items
    - Warranty issues

  - The Alarm Limit is Always ONE!

  - **Production tools or spare parts** that can be used to conduct repairs are not permissible in the CARE process.

VERIFICATION STATION

- **C.A.R.E**

    CUSTOMER **A**CCEPTANCE **R**EVIEW & **E**VALUATION

- The Plant Manager & Quality Manager should facilitate activities.

- **All items checked on the CARE station should be included in a check at an upstream VS station.** All quality check items checked at the VS must also have product quality standards included in the production work station standardized work, as applicable. Temporary check items can be added to the CARE process for a defined time frame without an upstream check as defined in local documentation.

- Report Non-Conforming Data to the *Fast Response* Meeting.

- Add the Root Cause/Corrective Action to the Layered Process Audit.

Note: Powertrain Suppliers are required to support C.A.R.E. process & procedures

Auditor hints

- Ask for set up a Verification Station for a theoretical problem and check that conditions are defined to establish VS in short time.

- Check a verification station, is clearly identified, developed acc. to standardized work: instruction developed, layout defined to avoid bypass and mixing of parts, training and necessary certification done.

- For PSA suppliers final inspection implemented as Verification Station.

- If needed, VS capacity confirmation via "limited" R@R.

Alarm Limit and VS management, what are we searching for?

Item	Requirement	#Criteria	Criteria requirement
VSEP2	Alarm and immediate reaction system defined; escalation process and records established for defects entering in the Verification Station.	VSEP21	Alarm limits are set based on type and number of defect found. Escalation procedure is defined and followed when alarm limit is reached.
		VSEP22	Results of controls are recorded (records the number of each type of problem by the hour) and posted at or near to Verification Station. A real-time follow up of results is applied.
		VSEP23	Immediate reaction is applied and recorded (issues, immediate fix, corrective action taken and breakpoint). Upstream reaction process is defined.
		VSEP24	Group leader reviews in a daily basis (daily management walk through or meetings) Verification Station activities and results and follow up the action plan.
		VSEP25	In case of lack of detection of non-conformance part, verification station controls have to be re-evaluated and improved.

Criteria of Requirement

◁ Prev. Requirement   Next Requirement ▷

Defects Entering the Station

Defects Entering
VS
Station

Checking the part for defects and raising Alarms

Defects Entering the Station

Alarm and Escalation:

- Alarm limits are set based on type and number of defect found.
- Alarm limits can be divided into two groups: PR&R type defect and High frequency low severity type defects.

Past Customer defects shall always have an alarm of 1.

High frequency low severity type.
THIS is an estimate based on the ability to detect.
Use your judgment.

Variable based on: Need, process, situation

It is best to not to have too many alarm levels so keep it simple. Group the Alarms based on the levels and Highlight them so it clear as to When to Call for Help.

Defects Entering the Station

Alarm and Escalation:

SCOPE OF CHANGING ALARM LIMITS

Alarm limits are changed or reduced when there is:

- An intentional, permanent change in the actual process such as through problem solving, or continuous improvement activity.

- A special cause variation, where despite our best efforts to discover the cause we are unable to make the correction and problem solving efforts have been escalated.
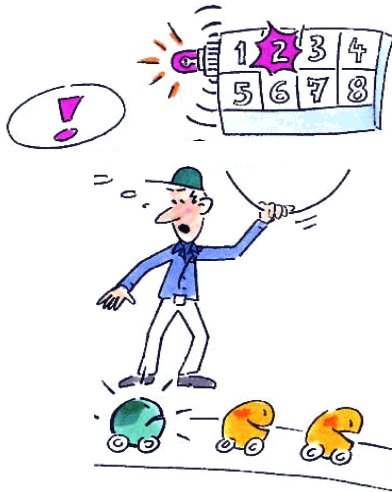
The Goal for all alarms is '1'.
No Alarms = No Improvement.
Alarms Set too high increase the risk for an escape!

Defects Entering the Station

Alarm and Escalation:

When a defect is detected, feedback to the appropriate team or individual will be given by using a communication system.

The alarm is raised by using audio/visual signals (e.g. Andon).

The alarm process directs the support functions to:

- **'Go and See'** the problem
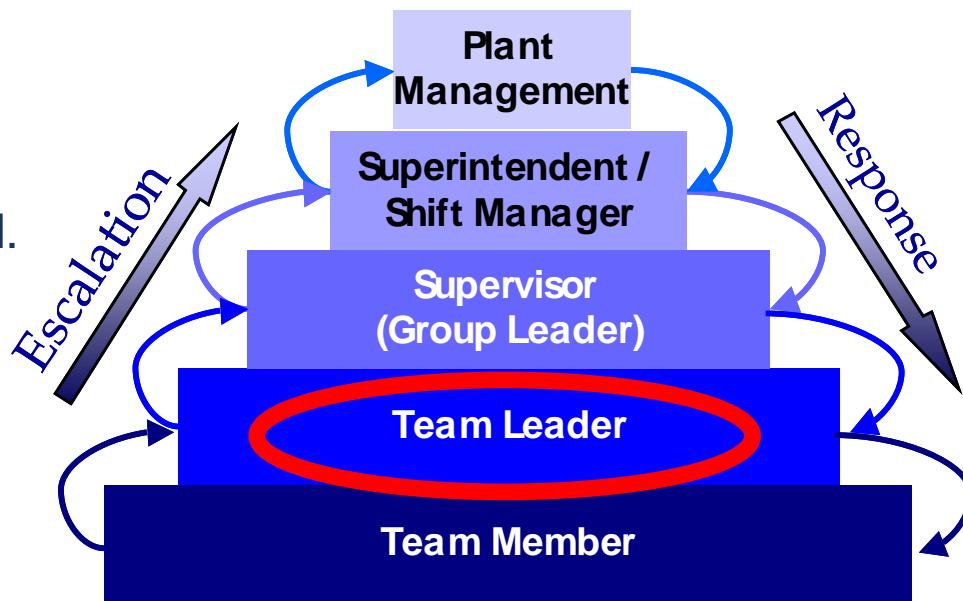- Apply containment to prevent further flow of defects
- Initiate problem solving

Defects Entering the Station

Alarm and Escalation:

If problems repeat, subsequent alarms shall be escalated to the relevant support functions to respond. (ref: Diamonds 1-4)

Alarm & escalation process will be documented and used in Verification Stations or any manufacturing step.

As alarms are triggered, the problem solving process is initiated to contain, determine root cause, apply effective countermeasures and establish a breakpoint for subsequent alarms.

Escalation

Response

Plant Management

Superintendent / Shift Manager

Supervisor (Group Leader)

Team Leader

Team Member

Defects Entering the Station
Alarm and Escalation:

The Tally Sheet:
- records the number of each type of problem by the hour.
- addresses special cause variation.
- alerts operator when alarm limit is reached.
- is located at or near the point of inspection.

(Example)

#	Defects	VS Alarm Trigger #	1st Hour 6:00-7:00 4:00-5:00	2nd Hour 5:00-6:00	3rd Hour 6:00-7:00	4th Hour 9:00-10:00 7:00-8:00	5th Hour 10:00-11:00 8:00-9:00	6th Hour 12:00-1:00 11:00-12:00	7th Hour 1:00-2:00 12:00-1:00	8th Hour 2:00-3:00 1:00-2:00	Total
1	Scratches	6	‖	I	‖						5
2	Bolt Reject	1	I		I						4
3	Lash Reject	4		‖	I						3
4	Crank Torque	5	‖	‖‖	I						6

Trigger an Alarm!

2nd Alarm is Escalated!

Trigger an Alarm

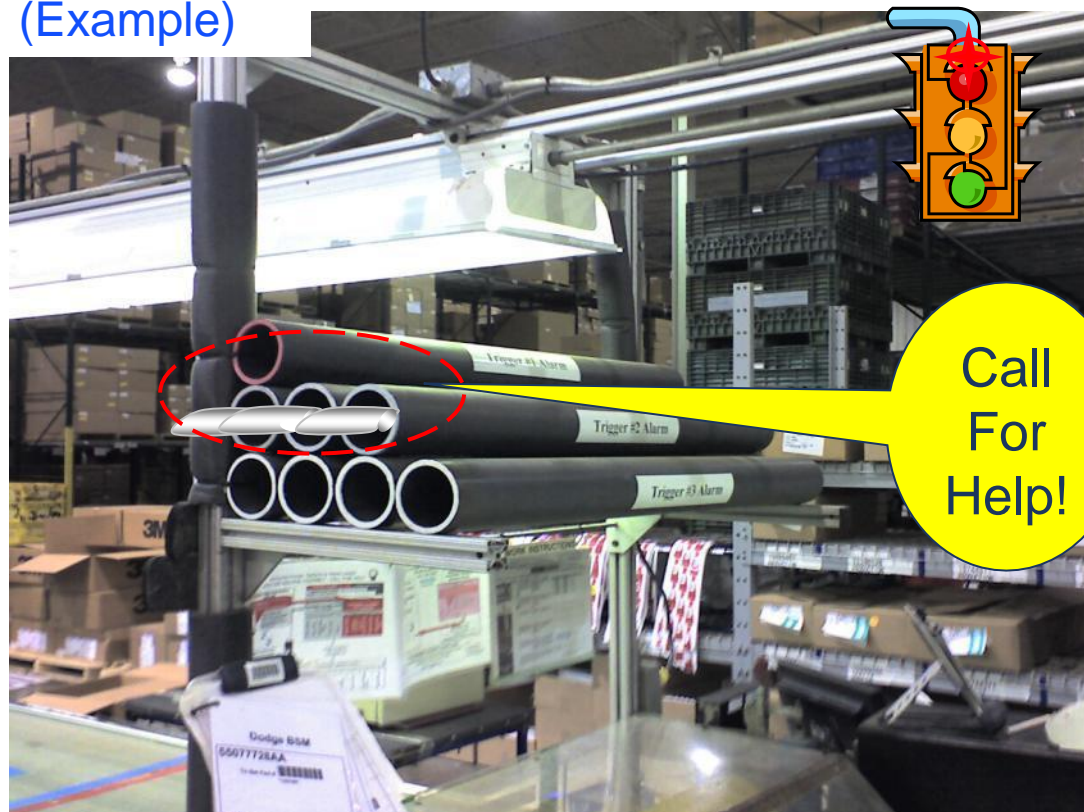Alarm by shift not hour.

Defects Entering the Station

Alarm and Escalation:

Multiple Alarm Levels – Visual Management

(Example)

Alarm Trigger Collection Point at the end of the assembly process.

2nd alarm Trigger is 3 pieces for Assembly type Defects – VS operator calls for help.

Call For Help!

Verification Station – Alarm Escalation Procedure

COMPANY ABC LOGO

	Alarm Trigger	Immediate Action	Types of Response
Level 1	**One (1)** PR&R type defect **Five (5)** or more common cause defects in one hour.	Inspector alerts Production Team Leader Inspector enters type of defect, time, **name of person contacted** and left or right door	Team Leader responds; Determines Point of Cause Responder institutes containment/corrective action and fills out right side of Immediate Response Action Sheet (and Containment Form, if applicable)
Level 2	No response to Alarm within 10 minutes **Second (2 Total)** PR&R type defect – Exactly the same as in Step#1 **Five more (10 Total)** or more common cause defects in the shift (same defect as in step#1)	Contact Supervisor	Same as above plus investigates cause of slow response Document corrective actions for defect and slow response on Immediate Response Action Shhet
Level 3	No response to Alarm within 20 minutes **Third (3 Total)** PR&R type defect – Exactly the same as in Step#1 **Five more (15 Total)** or more common cause defects in the shift (same defect as in step#1)	Contact Area Manager William XXXXXXXXXX XXXXXXXXXXXXXX	Same as above plus investigates cause of slow response
Level 4	No response to Alarm within 20 minutes **Foufth (4 Total)** PR&R type defect – Exactly the same as in Step#1 **Five more (20 Total)** or more common cause defects in the shift (same defect as in step#1)	XXXXXXX represent the persons name and Cell Phone number	Same as above plus investigates cause of slow response
Level 5	No response to Alarm within 20 minutes **Fifth (5 Total)** PR&R type defect – Exactly the same as in Step#1 **Five more (25 Total)** or more common cause defects in the shift (same defect as in step#1)	**Stop Production** Contact Plant manager Joe XXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXX	Same as above plus investigates cause of slow response

Defects Entering the Station

Immediate Response Process:

VS Operator/Inspector Section   (Example)

When an alarm is triggered, the verification station operator shall take immediate action & call for help, then fills in the left side of the immediate response document.

VERIFICATION STATION:							
VERIFICATION STATIONS RESPOND (Completed by the Verification Operator)							
#	Date/ Shift	Product Line	Serial#	Defect Description / Number	Who Was Called	Time	Escalation Level 1-5
1							
2							

Repeat alarms are noted by the escalation level.
The next level responder is called.

Defects Entering the Station

Immediate Response Process:

Responder's Section

- The responder begins the problem solving process immediately and shall document the results.
  - Containment, Immediate fix (sort, repair, scrap)
  - Point of Cause, Root Cause, Corrective Action
  - Was it Process Related or a Supplier Issue?

(Example)

Immediate Fix What was done with the defective Part?	Corrective Action: 1-Identify Point of Cause Station # ? 2-Standardized work followed? 3-Correct Tools / Fixtures / Error Proofing? 4-Correct Parts? 5-Parts in spec? 6-What did you do to stop a REPEAT defect from recurring?	*S A	Who Answered	Time	Breakpoint CSN #
	1-Stat #_____ 2- Y / N 3- Y / N 4- Y / N 5- Y / N 6:				
	1-Stat #_____ 2- Y / N 3- Y / N 4- Y / N 5- Y / N 6:				

Defects Entering the Station

Immediate Response Process:

Responder's Section (Cont.)

- The Break Point is the point at which all subsequent parts are known to be good due to containment and/or corrective action having taken place.
  - Both time and location should be recorded.
  - First good part should be identified so the Verification Station knows when the Break Point passes.

(Example)

Immediate Fix What was done with the defective Part?	Corrective Action: 1-Identify Point of Cause Station # ? 2-Standardized work followed? 3-Correct Tools / Fixtures / Error Proofing? 4-Correct Parts? 5-Parts in spec? 6-What did you do to stop a REPEAT defect from recurring?	*S A	Who Answered	Time	Breakpoint CSN #
	1-Stat # _____ 2- Y / N 3- Y / N 4- Y / N 5- Y / N 6:				
	1-Stat # _____ 2- Y / N 3- Y / N 4- Y / N 5- Y / N 6:				

VERIFICATION STATION

(2 Examples)

Integrate current systems and build on it to meet the intent.

This may include or incorporate Team data such as productivity, quality alerts, start of shift TPM Check Sheets, Team safety data or any other current standard Team data.

(Example)

Shop Floor Management

Defects Entering VS

➢Inspection of product (Attribute/Variable)
➢Prioritizing of defects
➢Alarm Escalation Procedure Who/when
➢Immediate Responses – Record of Calls
   for help and escalation.
➢Leadership meeting every shift
➢Meeting Assignments
➢Pareto Analysis, Defects over time
➢ Attendees Sign-in Sheet

Defects Leaving VS Station - Feedback

➢ Dock Audit/Containment/Field Rep-Liaison Issues
➢ Formal Customer Complaints - Reports
➢ Team Performance Data, FTQ & SCRAP Trend
   Charts (over time), Direct Run, Safety.

Problem Solving –
Driving fixes into station - BIQ

➢ Team select new problems based on
   pareto analysis, assignable cause.
➢Team reports out weekly on status
➢ Tracking R, Y, G Reviewed for
   roadblocks, problem escalation.

Side 1

Side 2

Side 3
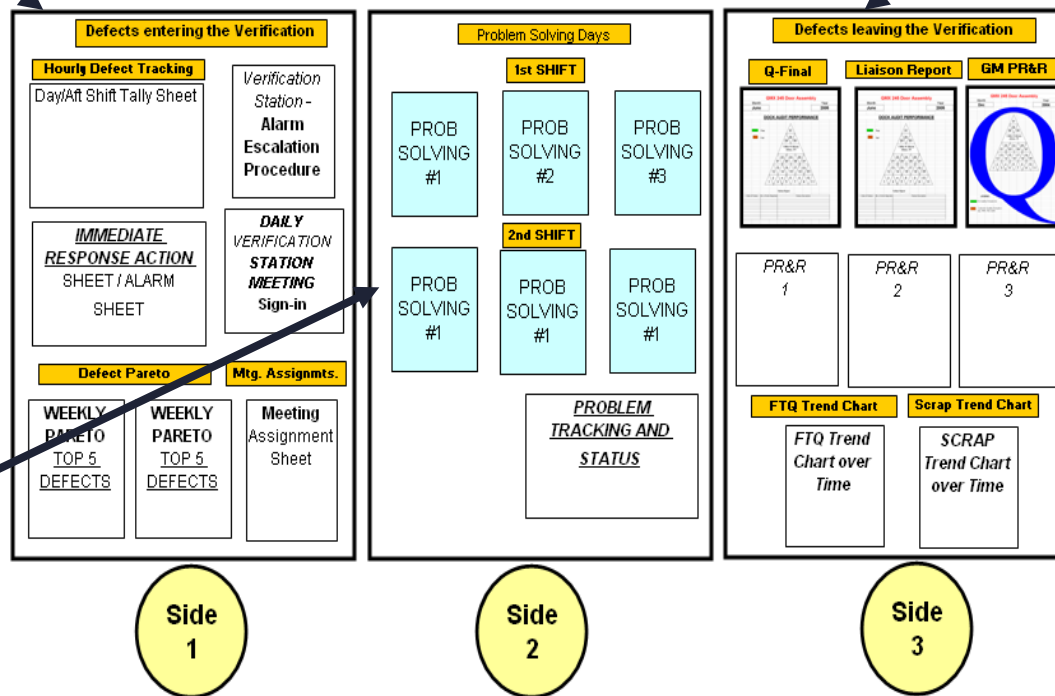
Defects Entering the Station

Leadership Support:

ASSIGNMENT ACTION SHEET

As issues come up at the daily VS or weekly Problem Solving report out meeting, any assignments given are captured here and reviewed at next meeting. Issues may include; material presentation, delivery, support needed to do their job better, faster or more accurately.

(Example)

	COMPANY ABC	Assignment Action Sheet (from daily and /or weekly review)			
Shift	Assign to	Task Name	Start Date	Expected Completion Date	Actual Completion Date

Defects Entering the Station

Leadership Support:
DAILY MANAGEMENT WALK-THROUGH

Management Walk –Through/Meeting shall be held daily on each shift at selected Verification Stations.

Points to review at the station are outlined in the example at the right.

Once per week, the Team also reports on a problem they are working to resolve.

Sign in sheet indicates presence and support at Management Walk - Through/Daily Meetings.

(Example)

Verification Station Review for week of:				Shift:			
			Initials				
PROBLEM REPORT OUT DAY	TUE	WED	THU	FRI	SAT	SUN	
Plant Manager							
Quality Manager							
Engineering Manager							
Maintenance Manager							
Area Supervisor							
Other							

Daily Leadership Review-VS Operator Report Out

1. Review the First Time Quality and Scrap Charts
   Is it getting worse, better or staying the same?

2. Review Alarms from Previous Shift(s)
   What are the problem(s)?
   Was the Immediate Action Response Sheet utilized?
   Was the response timely?
   Was Point of Cause and Root Cause identified?
   Did the defect re-occur and was the escalation process used?

3. Review Feedback from Downstream Customers:
   Were there any issues for the past 24 hours?
   Were the details of the issue communicated to the team members?
   Has a Quality Alert Been Posted?
   Is the issue being checked for at the Verification Station?

Weekly Problem Solving-Team Report Out

4. Review the Control Charts of Top Defects
   What are the Top Defects and What is the next issue to be worked on?

5. Problem Solving Team Report Out and Review
   Team member reports out to current problem solving step.
   Are there any road blocks that need to be removed?
   Are there any other resources that need to be assigned?
   Is the Tracking Report up to date and statused appropriately?
   Do any Problem Solving Assignments need to be escalated?(i.e.. Shainin, 6-Sigma)

Problem Solving

Leadership shall support problem solving by the Team based on VS data.

The pareto of defects is discussed and problems assigned to the team led by the Team Lead/Supervisor. This can be done by shift or across shifts.

Problems shall be tracked and the status reviewed weekly.

In case where NOK part escapes verification station, inspections and controls shall be reviewed and improved by leadership.

COMPANY ABC			PROBLEM TRACKING AND STATUS					
Problem Number	Shift	Start Date	Description of Problem	Assigned To	Date Solved	Solution	Date Validated	Status R-Y-G
						(Example)		

The Team is trained and uses the standard internal problem solving form to report out weekly during the Verification Station report out.

Leadership should identify when problems need to be escalated to the next level of problem solving such as statistical techniques.

Auditor hints

- Tally Sheet posted at or near the Verification Station, filled in properly.

- Ask VS operator about escalation. When and who to call,

    who responded and when.

- Check results back, proper escalation was done when alarm limit reached.

-   Alarm limits are reasonable: e.g.: 1 for customer complaint, GP12, CS.

- Check problem solving was applied, corrective actions were defined against main root cause (not re-training of operators).

- Verification station is owned by management.

Problem Solving at VS, what are we searching for?

Item	Requirement	#Criteria	Criteria requirement
VSEP3	The Error Proofing devices are identified, managed and regularly verified.	VSEP31	A master list of error-proofing devices is available and each error-proofing device/system is managed (description of verification, self or with master samples, etc).
		VSEP32	Error-proofing devices are verified regularly with master sample at least once per day, but at all part number change and start-up (including after significant production stop).
		VSEP33	When it is applicable, Gage R&R are been conducted to confirm EP efficiency.
		VSEP34	A visual management of EP failure is in place in the workshop.

Criteria of Requirement

Prev. Requirement   Next Requirement

Introduction

- **PURPOSE:**

Assures error proof/detection devices are working as intended to prevent *nonconforming product* from being made or transferred .

- **SCOPE:**
  - ❖ Assembly Area
  - ❖ Manufacturing Operations
  - ❖ Other support Functions

- **RESPONSIBILITY**:
  - • Ownership
    - ✓ Quality Manager
  - • Contingency plan for all situations

Benefits

- Assures error proof/detection devices are working as intended.

- Prevents *nonconforming product* from being made or transferred.

- Establishes a history for each device; indicates when preventative maintenance or repair is needed.

- Instills discipline within the process.

Method of Verification

- All error proofing/detection devices with the potential to fail, wear, misalign, or otherwise become out-of-adjustment shall be verified at a minimum of once per day. Considerations for establishing the frequency would include:

    - Lot size of parts run between Error Proofing verification

    - History of process to determine verification frequency

    - How robust is the process?

    - How easy is it to contain suspect product?

- The preferred method is for a team member/leader to perform as part of start-up and throughout the shift.

    - Note: This is not mastering a gage, (e.g. Setting gage to zero). It is sending known good & bad parts through to confirm the device is operating correctly.

Method of Verification (continued)

Error Proofing Device – (CAN NOT MAKE) - Devices which prevent the manufacture or assembly of *nonconforming product*.

Error Detection Device – (CAN NOT PASS or CAN NOT ACCEPT)
Devices which prevent the transfer of *nonconforming product* (e.g. 100% in-line inspection equipment).

Note: This QSB section will use the term error proofing device to incorporate error proofing and error detection devices.

- Error proofing devices shall be verified and their respective locations documented.
    - Master document of error proofing devices, with identification number and location.
    - Verification frequency should be documented
    - Identify masters(Good/Bad) and defect being checked
    - Define certification requirements for all masters
    - When applicable, Gage RR Study (GRR) shall be conducted to confirm EP efficiency (reference: AIAG MSA – Reference Manual)

Method of Verification (continued)

- Verification results (with operators sign off) shall be recorded with immediate responses to failures:

  - Develop log of error proof verification failure with reaction plans to nonconformities including containment.

  - Develop a procedure to notify of nonconformities and escalate reaction to nonconformities.

  - Corrective action report (Core "6 steps"/*Fast response*) should be opened to prevent error proofing device from failing again.

Auditor hints

- Participate at an Error Proofing verification, check process kept and documented well.

- Identification of EP devices on shop floor & coherence with the list.

- Records of verification (control plan, start-up work instructions).

- Check identification, conservation, easy access, calibration of master samples.

- Work Instructions for verification.

Error Proofing Device management, what are we searching for?

Item	Requirement	#Criteria	Criteria requirement
VSEP4	In the event of Error Proofing devices malfunction, the suspect products are managed. Reaction to failures, corrective actions and re-verification are documented.	VSEP41	All the EP failures have to be documented and reaction plan includes who is notified and actions to be taken.
		VSEP42	All the parts produced since the last OK verification have to be handle as suspected material and apply containment.
		VSEP43	Corrective actions to fix Error Proofing device failure is documented.
		VSEP44	In the event of error proofing devices malfunctioning or unavailability, production is stopped until capable substitution processes/control are identified and handled as by-pass process. Containment process is applied in this case.

Criteria of Requirement

Prev. Requirement   Next Requirement

Reaction Plan

- Escalation Process shall be defined and applied when error proofing devices fail:
  - ❖ Who shall be notified
  - ❖ How/Where to record the Issues and Corrective Actions

When the error proofing devices fail, product shall be verified back to that last good check
  - ❖Refer to QSB key element – Control of nonconforming product

- When the error proofing devices needs to be replaced due to fail or unavailability, the production shall be stopped till a bypass process be defined and followed
  - ❖ Refer to QSB key element – Managing Change

Note: Issues with Error Proofing should be addressed to Fast Response Meeting

Auditor hints

- Ask people who make EP verification about his/her responsibility in case of EP failure and escalation process.

- Check back records that containment were done for all the EP failures.

Reaction Plan, what are we searching for?

Item	Requirement	#Criteria	Criteria requirement
VSEPE	Targets are defined and followed to evaluate Verification Station & EP effectiveness.	VSEPE1	Performance Graphic, Q chart or report card (i.e. calendar days-red/green, I-chart etc.) showing feedback from downstream processes.
		VSEPE2	FTQ or internal scrap metrics showing improvement trend, reduction of events/defects over time.
		VSEPE3	Tracking of error proofing failures.
		VSEPE4	Verification station applied flexible, alarm limits are reviewed continuously.

Criteria of Requirement

◁ Prev. Requirement   ▷ What goes wrong ?

Defects Leaving the Station

Quality Feedback/ Feed Forward:

Process A	Process B	Process C
(Suppliers)	YOU	(Customer)

back   forward
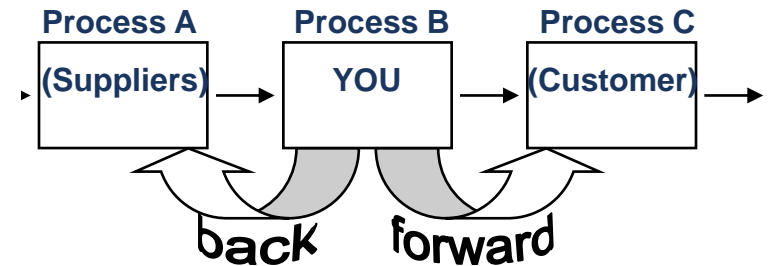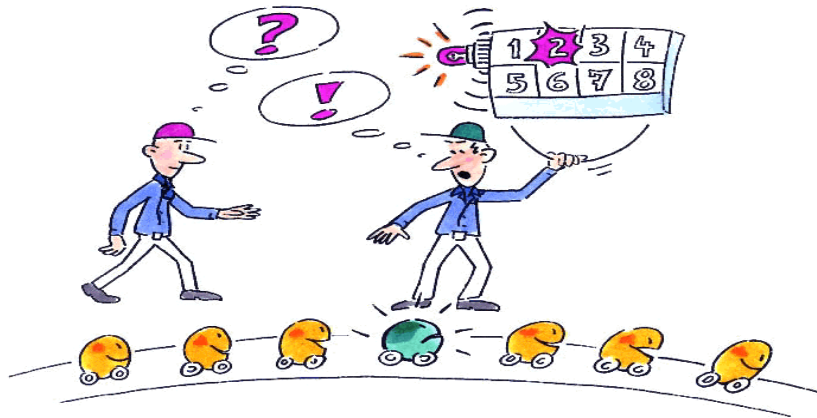
Definition: The communication of quality expectations and results between customers and suppliers through standardized communication pathways.

Purpose: To ensure that information on quality reaches those who need it.

Defects Leaving the Station

Quality Feedback/ Feed Forward:

How do we Know that the Verification Station is doing its job and driving Quality back into Station?

Defects Leaving the Station

Quality Feedback/ Feed Forward:

Feedback details are communicated from all downstream customers including between departments at the manufacturing site.

| Defects found at internal audit or containment check points including GP12	Issues that escaped to the Customer and are caught by the Supplier contact	Issues that escaped to the customer and are found by the customer
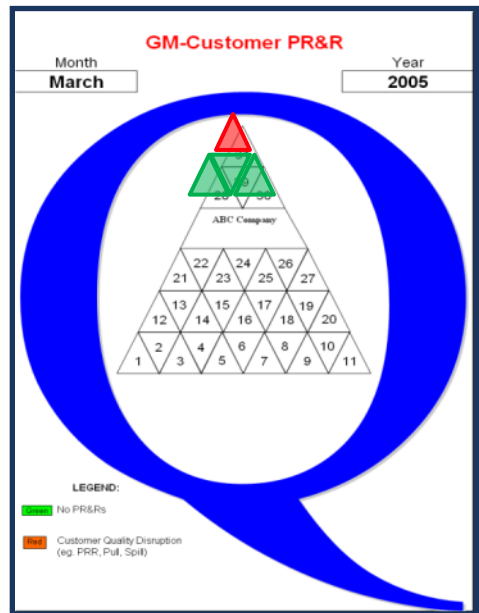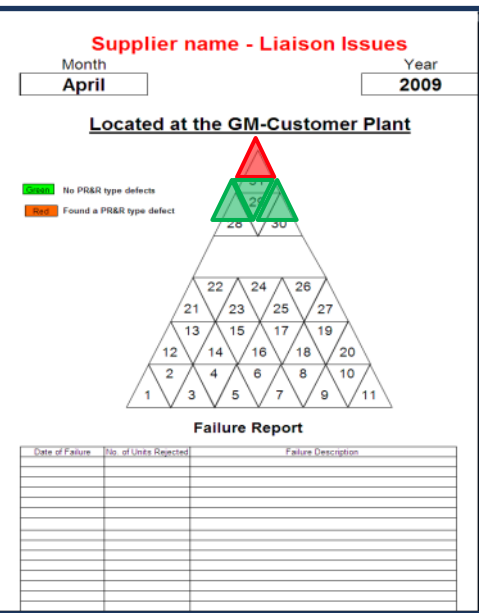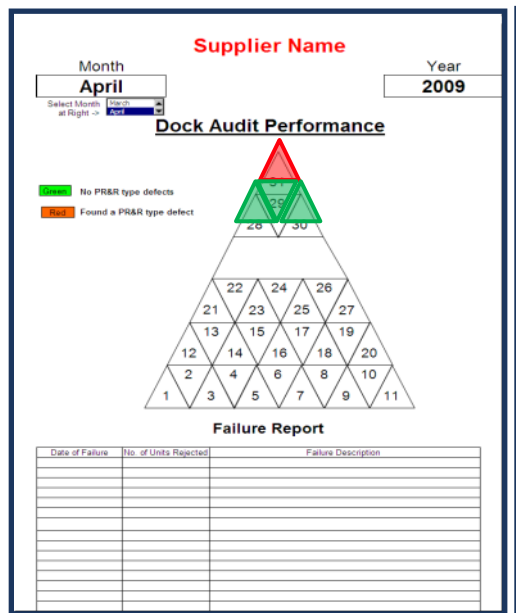
Management

Performance Metrics:

The check portion of Implementing a Verification Station is measuring the effectiveness and seeing results. This can be done by using a simple line graph representing the number of red days for each downstream customer as well as tracking internal metrics such as scrap, direct run, internal ppm, efficiency, uptime.

FTQ and performance matrices charts are monitored over time to check improvement and effectiveness of verification station.

Alarms limits are reviewed continuously based on VS results (both defect entering and leaving the VS).
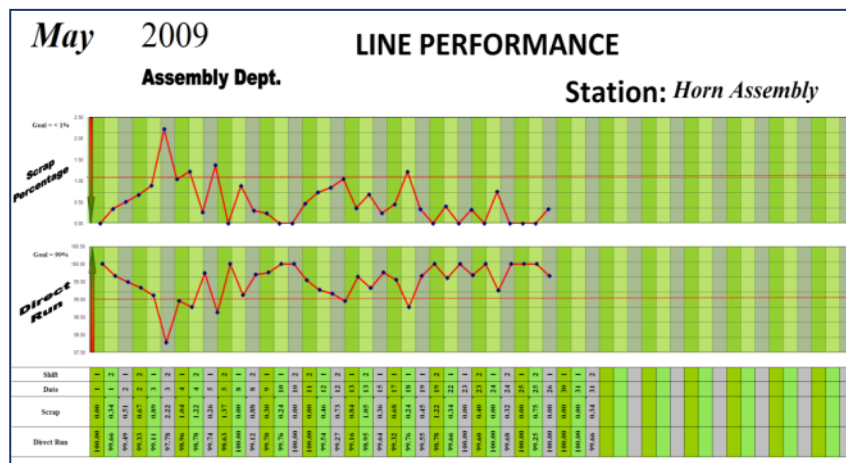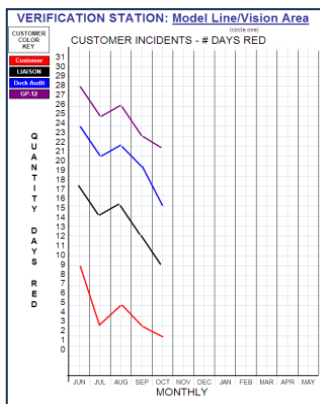
Management Review

Verification results shall be reviewed by site leadership

- Method for getting information to management

- Determine how information is to be displayed

(Example)

ERROR PROOFING VERIFICATION CHECKLIST

SHIFT: _____

DATE: _____

SNAP RING PRESENCE

op#		THESE ITEMS ARE TO BE CHECKED *DAILY*	Code	YES	NO	PROBLEM
OP 30	4	OPERATE L&R SNAP RING INSTALLATION TOOL WITHOUT SNAP RING - IS PART REJECTED ?	4			
OP 30	5	DID RED LIGHT ON LIGHT TREE TURN ON ? (L&R)	5			
OP 30	6	DID REJECTED PART STAY IN STATION ? (L&R)	6			
OP 30	7	DID ANDON ALARM SOUND? (L&R)	7			
OP 40	8	OPERATE SMALL SNAP RING INSTALLATION TOOL WITHOUT SNAP RING - DID GAGE REJECT PART ?	8			
	9	DID RED LIGHT ON LIGHT TREE TURN ON ? (SMALL SNAP RING)?	9			
	10	DID REJECTED PART STAY IN STATION? (SMALL SNAP RING)	10			
	11	DID ANDON ALARM SOUND ? (SMALL SNAP RING)?	11			
	12	DOES PART STILL STAY IN STATION WHEN HAND VERIFICATION TOOL DISPLAYS A RED REJECT LIGHT?	182			
	13	IS SMALL SNAP RING VISUAL IN PLACE ?	15			
	14	IF SMALL SNAP RING TOOL IS DOWN, IS THE BACK-UP GAGE USED?	12			
	15	DOES BACK-UP GAGE REJECT PART IF NO SNAP RING IS PRESENT?	13			
	16	DOES THE LIGHT TURN RED? (SMALL SNAP RING BACK-UP)?	14			

	YES	NO
TOTAL # OF X'S IN EACH COLUMN →		

SUPERVISOR: _____

AUDITOR: _____

ANY ITEM SHADED NOT WORKING PROPERLY, THE SUPERVISOR MUST BE NOTIFIED IMMEDIATELY.

ANY ITEM OUT OF COMPLIANCE SHOULD BE REVIEWED WITH SUPERVISOR OR A COPY OF THE AUDIT GIVEN TO SUPERVISOR.

Completion of the verification shall be documented and easily accessible. The device's verification status should be visible to everyone in the area.

DEPT._____   ERROR PROOFING VERIFICATION RESULTS
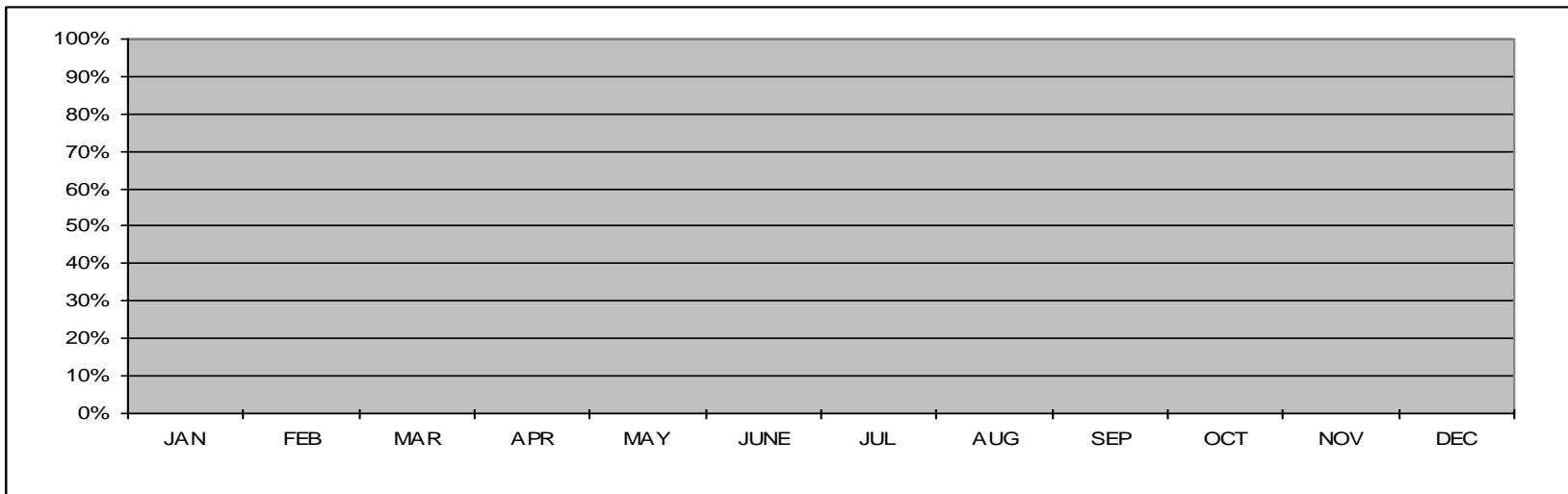
	JAN	FEB	MAR	APR	MAY	JUNE	JUL	AUG	SEP	OCT	NOV	DEC
% IN COMPLIANCE:												
# OF ITEMS ON CHECKLIST:												
# OF VERIFICATIONS												
TOTAL # OF ITEMS VERIFIED:												
# OF ITEMS IN COMPLIANCE:												

ITEMS NOT IN COMPLIANCE	NUMBER OF ITEMS NOT IN COMPLIANCE											

Auditor hints

- Prior to audit check customer complaints caused by failed error proofing or no detection on verification station.

- Any long lasting CS, GP12 or temporally verification station. Actions to close them.

- Review charts, verify action brought expected result.

- Check how often the alarm limit reach: no alarm=no improvement.

- Check that verification station(s) selected efficiently:

  1. review data: customer complaints (any major or repetitive issue), CSs, GP12, FTQ results, high RPN items from PFMEA, process capability data.

  2. Based on data reviewed, evaluate if Verification Station(s) implemented to right place or there is a need to implement a new one(s).

- Verify that Error Proofing verification frequencies are reasonable.

What goes wrong ?

- Verification Station strategy is not used in a flexible way

- Defects on tally sheet are not the most critical type of defect

- Alarm limit is set too high

- Only data collection without analysis

- Immediate responses do not initiate preventive actions

- Root causes are not defined (missing DD approach)

- Verification Station is not owned by Management

- No C.A.R.E implemented at Powertrain suppliers

What goes wrong ?

- Not all the error proofing devices are verified

- Verification documented as completed but not actually performed

- Result of verification driven by Master status (Bad Master = NOK result)

- Frequency of verification is not reviewed

- Reaction plan is not defined / followed in case of verification failure

- Verification failures not escalated so no action taken

- Containment not implemented when error proofing disabled

- If error proofing device malfunctions, all parts should be rejected

- Error proofing disabled - too many parts rejected or considered false fails