

## **8-D PROBLEM SOLVING OVERVIEW**

### **WHAT IS AN 8-D?**

IT IS A TERM USED TO REFERENCE THE EIGHT STEPS OR DISCIPLINES WE FOLLOW IN THE IDENTIFICATION, INVESTIGATION AND RESOLUTION OF “CONCERNS”.

### **WHAT IS A “CONCERN”?**

FOR THE PURPOSE OF THIS DISCUSSION, A “CONCERN” IS A THINGS-GONE-WRONG OR SOMETHING THAT IS NON-COMPLIANT IN NATURE.

WE GENERALLY AFFILIATE THIS TERM WITH A “FAILURE IN A PROCESS” OR SYSTEM CAUSING AN UNDESIRED OUTCOME!

### **ROOT CAUSE ANALYSIS**

WHEN ANALYZING A CONCERN FOR ITS ORIGIN, ALWAYS REMEMBER TO KEEP THIS IN MIND:

- ABOUT 85% OF THE TIME, THE ROOT CAUSE OF A PROBLEM IS FOUND TO BE THE RESULT OF A FAILURE IN THE PLANNING, METHOD PROCEDURE PROCESS, OR SYSTEM. ONLY ABOUT 15% OF THE CASES ARE THE ROOT CAUSE – A LOCAL FAULT LIKE OPERATOR ERROR, ETC.
- WHEN YOU THINK YOU OBVIOUSLY KNOW THE REASON THAT CAUSED THE CONCERN, ASK “WHY DID THAT HAPPEN”, AND WHEN YOU GET THAT ANSWER, THEN ASK “WHY DID THIS HAPPEN” AND REPEAT THE “WHY” PROCESS UNTIL YOU HAVE GONE DEEP ENOUGH BACK INTO THE CAUSE TO REVEAL THE TRUE, BOTTOM LINE “ROOT CAUSE”.

### **WHEN AND WHERE DO WE USE THE 8-D PROCESS?**

- TO IMPROVE / ELIMINATE QUALITY CONCERNS.
- REDUCE COST CONCERNS
- PREVENT SAFETY CONCERNS
- YOU WILL FIND THE 8-D PROCESS HAS GENERAL APPLICATION TO ALMOST ANY SITUATION YOU ENCOUNTER

## 8-D STEPS

### THE FOLLOWING ARE THE 8 BASIC STEPS OF THE 8-D PROCESS:

1. TEAM CONTACT
  - REFERENCE INFORMATION ABOUT THE INITIATOR AND ASSIGNEE OF THE 8-D.
2. DESCRIBE THE PROBLEM
  - STATEMENT DESCRIPTION OF THE ACTUAL CONCERN (PROBLEM). ALSO, THE SOURCE THAT IT CAME FROM AND SEVERITY, OR, HOW BAD IT IS.
3. ROOT CAUSE ANALYSIS
  - MOST IMPORTANT ELEMENT OF THE WHOLE PROCESS! HAVE TO ANALYZE, BRAINSTORM THE PRIMARY REASON THE CONCERN HAPPENED. KEEP ASKING WHY, WHY, ETC. IN SUCCESSION UNTIL ROOT CAUSE IS FOUND.
4. ACTION TAKEN (INTERIM)
  - FIRST STEP YOU TAKE TO ISOLATE THE CUSTOMER FROM THE PROBLEM, IMMEDIATELY!
5. ACTION TAKEN (PERM)
  - ACTION TAKEN TO CHANGE THE METHOD, SYSTEM, PROCESS ON PERM. BASIS TO KEEP FROM RECURRING.
6. VERIFICATION OF ACTION
  - HOW YOU KNOW YOUR ACTIONS ARE EFFECTIVE. INSPECTION RESULTS LARGE SAMPLING SPC CHARTS OR OTHER MEASURABLES.
7. PREVENTION
  - AFTER YOU'VE FOUND THE ROOT CAUSE AND TAKE ACTIONS, THINK AND STATE HERE WHAT COULD HAVE BEEN DONE TO PREVENT THE PROBLEM FROM HAPPENING IN THE FIRST PLACE.
8. CONGRATULATE YOUR TEAM
  - ALWAYS RECOGNIZE YOUR PEOPLE FOR THE ACCOMPLISHMENTS THEY ACHIEVED IN THIS PROCESS TO RESOLVE THE CONCERN AND WORKING AS A TEAM.

## **GUIDELINES, DESCRIPTION AND SUGGESTIONS**

### **TEAM CONTACT:**

HERE YOU SHOULD INCLUDE THE NAME OF THE PERSON WHO IS THE "OWNER" OF THE 8-D CONCERN (RESPONSIBLE FOR ITS RESOLUTION AND FOLLOW-UP). SHOULD INCLUDE THEIR TITLE AND PHONE # FOR REFERENCE AND DATE 8-D WAS OPENED.

### **PROBLEM DESCRIPTION:**

IT IS EXTREMELY IMPORTANT THAT ASSIGNEE OF THE 8-D OR TEAM FULLY UNDERSTAND PRECISELY WHAT THE SPECIFIC PROBLEM IS. THE BEST WAY IS TO PHYSICALLY LOOK AT THE EXAMPLE "HANDS-ON". ANOTHER IMPORTANT ITEM TO HELP YOU UNDERSTAND THE PROBLEM IS TO OBSERVE WHAT NEEDS TO BE DONE TO REPAIR IT TO ITS DESIRED STANDARD LEVEL.

IN THIS BLOCK, JUST STATE THE PROBLEM AS OBSERVED! DON'T TRY TO INCLUDE THE CASE HERE.

### **SOURCE:**

FOR THE PURPOSE OF LOGICALLY UNDERSTANDING A PROBLEM, YOU OR SOMEONE EVALUATING THE 8-D NEEDS TO KNOW WHERE THE PROBLEM OR CONCERN IS BEING REPORTED. THIS HELPS MANAGEMENT PLACE URGENCY ON FIXING A CONCERN. IF A CONCERN IS BEING REPORTED FROM EXTERNAL INDICATORS FROM EXTERNAL CUSTOMERS, IT GENERALLY WILL GET MORE SUPPORT IN ORDER OF IMPORTANCE. HOWEVER, THE DETERMINATION OF PRIORITY IS A DECISION TO BE MADE BY MANAGEMENT. ON ALL 8-D'S WRITE DOWN THE SOURCE. EXAMPLES MOST COMMON ARE: FORD SURVEYS, WARRANTY, NOVA-C AUDITING, CNVQ/NVQ, FIRST RUN, OR OTHER.

### **RANK OR SEVERITY:**

THIS TELLS HOW MANY OF THE CONCERNS ARE BEING REPORTED. YOU SHOULD REPORT IT IN: R/100, TGW/100, C/100 OR PER 1000. SINCE ASSEMBLY PLANTS PRODUCE THOUSANDS OF VEHICLES PER DAY, WE USE C'S OR R'S PER 1000. YOU GET THIS VALUE BY DIVIDING THE TOTAL NUMBER OF CONCERNS BY THE TOTAL NUMBER OF VEHICLES IN YOUR SAMPLE (OR TOTAL NUMBER IN THE SAMPLE). FOR EXAMPLE: 14 LOOSE RUNNING BOARDS REPORTED ON 253 UNITS WITH RUNNING BOARDS WOULD BE:  $14 \div 253 = .055$  OR 5.5 PER 100 OR 55 PER/1000.

ALSO, BY LISTING THE QUANTITY, IT HELPS THE TEAM GET PRIORITIES PLACED ON RESOLVING A CONCERN. YOUR MANAGEMENT CAN QUICKLY ASSESS HOW BAD A PROBLEM IS IN DETERMINING ITS URGENCY TO FIX.

### **ROOT CAUSE ANALYSIS:**

IN MOST CASES, THE "ROOT CAUSE" CAN ONLY BE DETERMINED BY REPEATEDLY ASKING "WHY" IN SUCCESSION. IF YOU FAIL TO DO THIS YOU RUN THE RISK OF ONLY LOOKING AT SYMPTOMS OF THE "ROOT CAUSE" AND MAY NOT BE ABLE TO PERMANENTLY PUT A PROBLEM TO BED. RULE OF THUMB IS YOU SHOULD ASK "WHY" 3-5 TIMES TO GET FAR ENOUGH BACK INTO A PROBLEM'S ORIGIN.

BUT SOMETIMES YOU DON'T KNOW THE "ROOT CAUSE" UNTIL YOU CLEAR UP SOME OF THE SYMPTOMS. TRUE "ROOT CAUSE"(S) ARE USUALLY "SYSTEM PROBLEMS" IN PLANNING/DESIGNING/TRAINING, ETC. AND IN MANY CASES, YOU WILL ANSWER THE "ROOT CAUSE" IN YOUR CONCLUSION OF PREVENTION ANALYSIS. THERE CAN BE MORE THAN ONE ROOT CAUSE. IF YOU CANNOT READILY IDENTIFY THE "ROOT CAUSE" OF THE CONCERN (PROBLEM), THE NEXT BEST THING TO DO IS TO LIST THE MOST LIKELY SYMPTOMS RESPONSIBLE AFTER YOU BRAINSTORMED THE PROBLEM.

IT IS ACCEPTABLE TO WRITE THE FOLLOWING UNDER ROOT CAUSE ANALYSIS WHERE IT HAS NOT BEEN IDENTIFIED:

ROOT CAUSE: UNKNOWN AT THIS TIME.  
(POSSIBLE SYMPTOMS ARE):

- A.
- B.
- C.
- D.
- ETC.

YOU MAY WANT TO PURSUE OPENING SEPARATE 8-D'S FOR SOME OF THE SYMPTOMS. YOU DECIDE IF ITS FEASIBLE OR RATIONAL. IN THE MEAN TIME, GO AFTER THE MOST LIKELY "SYMPTOMS" CAUSES (S) YOUR TEAM HAS DETERMINED AS MAJOR CONTRIBUTORS OF THE PROBLEM. LIST THEM AS:

- A.
- B.
- C.
- D.
- ETC.

UNDER ROOT CAUSE ANALYSIS AND START SELECTING ACTIONS FOR EACH TO CORRECT EACH SYMPTOM.

**ACTIONS:**

ONCE YOU HAVE IDENTIFIED AND LISTED THE ROOT CAUSE(S) OR SYMPTOMS, LIST THEM ON THE 8-D UNDER THE ACTION SECTION. ASSIGN THEM A CORRESPONDING REFERENCE LETTER OR NUMBER: A, B, C, D OR 1, 2, 3, 4, ETC. THAT MATCHES THE CAUSE/SYMPTOMS IN ROOT CAUSE ANALYSIS SUMMARY BLOCK.

NEXT, FOR EACH CAUSE LISTED, DECIDE WHAT WOULD BE THE MOST APPROPRIATE ACTION TO CORRECT IT. IF THE ACTION IS COMPLEX OR WILL TAKE SOME TIME TO IMPLEMENT, THEN PUT IN AN "INTERIM" SHORT-TERM FIX IMMEDIATELY TO ISOLATE THE CONCERN/PROBLEM FROM GETTING TO THE CUSTOMER.

REMEMBER, ITEMS SELECTED FOR THE 8-D PROCESS SHOULD BE PRIORITY ITEMS THAT YOUR TOTAL ORGANIZATION AGREES MUST BE FIXED. THEREFORE, THE ACTIONS TO CORRECT THEM SHOULD RECEIVE FULL SUPPORT ONCE THEY HAVE BEEN IDENTIFIED THROUGH A THOROUGH BRAINSTORMING INVESTIGATION.

ONLY LIST ACTIONS ON THE 8-D THAT "DO" SOMETHING. TALKING TO SOMEONE, SETTING UP MEETINGS, HOLDING MEETINGS, DISCUSSING AND REVIEWING ARE NOT "MEASURABLE". ONLY THINGS THAT "CHANGE" SOMETHING IN A PROCESS OR METHOD – MATERIAL MACHINES, MANPOWER OR ENVIRONMENT ARE ACCEPTABLE ACTIONS ON CAUSE(S). IF AN ACTION IS INTERIM, WE INDICATE IT WITH AN (I), IF IT IS PERMANENT, WE INDICATE WITH (P).

- MAKE SURE YOU INDICATE THE DATE THE ACTION WAS TAKEN OR ESTIMATED TO BE TAKEN.

## **VERIFICATION:**

FOR EACH ACTION TAKEN, YOU WILL WANT TO KNOW THE EFFECTIVENESS OR RESULTS. YOU NEED TO LOGICALLY DETERMINE HOW TO MEASURE EACH ACTION. THE ITEM YOU USE TO MEASURE YOUR ACTIONS WILL BE THE INDICATOR ON THE 8-D UNDER THE VERIFICATION BLOCK.

EXAMPLES OF COMMON INTERNAL INDICATORS MIGHT BE:

- TALLY SHEET
- IN-HOUSE INSPECTION DATA
- CONTROL CHART DATA
- GAGE TEST RESULTS
- LOCAL SURVEY
- SNAPSHOT SAMPLING

EXAMPLES OF COMMON EXTERNAL INDICATORS MIGHT BE:

- FORD SURVEY RESULTS
- WARRANTY REPORT
- NOVA-C AUDITING
- CNVQ/NVQ
- OTHER EXTERNAL QUALITY INFO

**ALWAYS WRITE DOWN THE INDICATOR OF THE ACTION YOU ARE MEASURING.**

## **BEFORE/AFTER:** **(VERIFICATION)**

FOR THIS PORTION OF THE 8-D, YOU NEED TO LOOK AT THE DATE OF THE ACTION AND LIST IT AS THE BASELINE "BEFORE". THEN QUANTIFY IN R/100 OR WHATEVER MEASURABLE VALUE YOU ARE USING IN THE BEFORE COLUMN THAT MATCHES THE ACTION.

THE "AFTER" IS THE SAME INFORMATION ON THE ACTION (DATE, R/100, ETC.) AFTER IT WAS TAKEN.

IF YOU DON'T HAVE "AFTER" RESULTS YET BECAUSE ACTION IS GOING TO BE DONE IN THE FUTURE, THEN PUT DOWN "TBD". BUT REMEMBER, IF YOU HAVE A "TBD" AND THE PROBLEM IS A SERIOUS CUSTOMER CONCERN, THEN YOU NEED TO HAVE SOME SORT OF CONTAINMENT, INTERIM ACTION, TO KEEP IT FROM GOING TO YOUR CUSTOMER UNTIL "TBD" HAPPENS.

## **PREVENTION:**

ONCE YOU HAVE COMPLETED ALL YOUR INVESTIGATION, ANALYSIS, ACTIONS AND VERIFICATIONS, AND YOU HAVE SIGNIFICANTLY REDUCED OR ELIMINATED THE CONCERN, THE TEAM NEEDS TO STATE THE PREVENTION.

FOR PREVENTION CONCLUSION ASK: "WHAT COULD WE HAVE DONE TO HAVE PREVENTED THIS PROBLEM BASED ON WHAT WE SEE AND EXPERIENCED?" IN MANY CASES YOUR PREVENTION WILL DESCRIBE THE REAL "ROOT CAUSE".

GIVE THOUGHT AS TO HOW TO PREVENT THIS PROBLEM. STATE IT ON 8-D AND CONSIDER IT IN YOUR FUTURE PLANNING WHERE SIMILAR PROBLEMS COULD ARISE.

## **CONGRATULATE YOUR TEAM:**

OPTIONAL! WE HAVE LEARNED THAT IT NEVER HURTS TO TAKE THE TIME TO RECOGNIZE OR THANK THE TEAM OF PEOPLE WHO WERE INVOLVED IN IMPROVING SOMETHING. PEOPLE APPRECIATE BEING RECOGNIZED FOR THEIR ACCOMPLISHMENTS.

THIS IS DONE WHEN THE PROBLEM HAS BEEN FIXED AND PROBLEM CLOSED.

**EXAMPLE OF AN EFFECTIVE 8-DISCIPLINE REPORT**

(1) TEAM CONTACT: PHONE NO: 6705 YEAR/CARLINE: XXXX  
ECONOLINE  
ASSIGNEE: R. McLain COMPONENT: Chassis  
ACTIVITY: Chassis INITIATOR: J. Howard (Area  
Production Mgr.)  
DATE OPENED: 4/13/XX PLANT: Lorain Assembly

(2) PROBLEM DESCRIPTION & PARETO SOURCE/RANK

DESCRIPTION:

Scratch front bumper (left side)

SOURCE/RANK

<u>CNV</u>	<u>NV</u>	<u>PROBE</u>	<u>INSP.</u> <u>STUDY</u>	<u>WARRANT</u>	<u>FOCUS</u> <u>EVAL.</u> <u>FLEET</u>	<u>FIRST</u> <u>RUN</u>	<u>FIELD</u> <u>LIAISO</u>	<u>OTHE</u> <u>R</u>
Q	Q			Y		<u>28R/100</u> 0 Pre- Delivery	N	R

(3) ROOT CAUSE(S):

The prove-out method used setting up rear bumper fixture failed to identify the potential of the fixture arm contacting front bumper on release. Focus of this fixture concentrated on the rear bumper affects only.

(4 & 5) ACTIONS:

Identify as Interim (I) / Permanent (P)

(6) VERIFICATION:

	<u>ACTION</u> <u>DATE</u> <u>EFF.</u>	<u>INDICATOR</u>	<u>BEFORE</u>	<u>AFTER</u>
A. (I) Set up positive buy inspection for damaged bumpers prior to leaving plant & repair all units.	4/13/XX	A. Pre-Delivery Inspection Tally	4/13/XX 28R/1000	
B. (P) Designed and installed soft roller on pivot pin of bumper fixture arm to prevent damage.	4/14/XX	B. Pre-Delivery Inspection Tally	4/14/XX 28R/1000	4/14-4/28/XX OR/1000
C. (P) Revised new tooling/fixture prove-out procedure to include systems damage analysis sign-off.	4/15/XX	C. New fixture installation procedure	4/15/XX No sign-off req'd	4/15/XX Sign-off required

(7) PREVENTION:

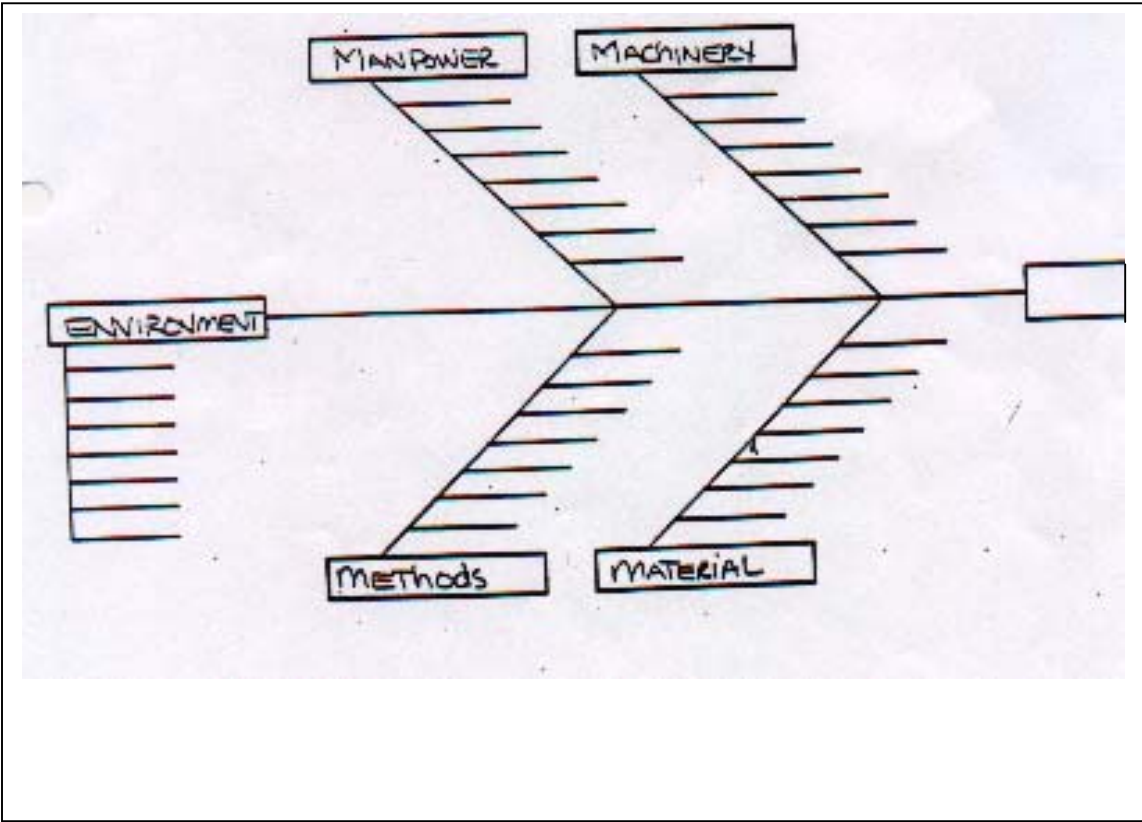
When installing fixtures in assembly, include potential system damage as a part of implementation.

(8) CONGRATULATE YOUR TEAM:

Congratulations to: R. McLain, J. Reinhardt, Tom Aston, Bill Bradley, J.L. Howard for the investigation and resolution of this concern.



**PROBLEM ANALYSIS  
(FISHBONE CHART)**





**SAMPLE**  
**8-DISCIPLINE REPORT**

(1) **TEAM CONTACT:**

(2) **PROBLEM DESCRIPTION**

**SOURCE/BANK:**

(3) **ROOT CAUSE(S) ANALYSIS:**

(4 & 5) **ACTIONS:**

(6) **VERIFICATIONS:**

	<b><u>DATE EFFECTIVE</u></b>	<b><u>INDICATOR</u></b>	<b><u>BEFORE</u></b>	<b><u>AFTER</u></b>
A.		A.		
B.		B.		
C.		C.		
D.		D.		

(7) **PREVENTION:**

(8) **CONGRATULATE THE TEAM:**