

MANUFACTURING INSIGHTS

Setup Reduction

SCENE 1.
CG: FBI warning
white text centered on black to blue
gradient

WARNING

Federal law provides severe civil and
criminal penalties for the unauthorized
reproduction, distribution or exhibition
of copyrighted media.

Copyright ©

Society of Manufacturing Engineers

SCENE 2.
AME Logo from Inc. Lean

PRODUCED IN COOPERATION WITH THE ASSOCIATION
FOR MANUFACTURING EXCELLENCE

SCENE 3.
SME logo, with music

SCENE 4.
MI open, with music

MUSIC UP AND UNDER

NARRATION (VO) :

MANUFACTURING INSIGHTS, MANUFACTURING
ENGINEERING MAGAZINE'S VIDEO SERIES FOR
PROCESS IMPROVEMENT.

SCENE 5.a

01.37.54.00 - 01.38.03.00

5b 01.34.08.00 - 01.34.18.00

NARRATION (VO) :

THIS PROGRAM EXPLORES HOW SETUP REDUCTION IS
BEING USED AT THE PLYMOUTH TUBE COMPANY TO
REDUCE COSTS AND RESPOND QUICKLY TO CHANGES IN
CUSTOMERS ORDERS.

Fade to black

SCENE 6.
01.34.43 - 01.34.56.00

NARRATION (VO) :

AS COMPANIES MOVE AWAY FROM MAKING LARGE
BATCHES OF PRODUCTS, ONE OF THE UNFORTUNATE
CONSEQUENCES IS THAT NOW THEY HAVE TO CHANGE

01.35.28.00 - 01.35.43.00

03.05.23.00 - 03.05.45.00

OVER THEIR MACHINES MORE OFTEN. THESE FREQUENT
CHANGEOVERS MAY BE DISRUPTIVE TO PRODUCTION
AND, IF NOT MANAGED CORRECTLY, CAN CAUSE BIG
PROBLEMS.

SCENE 7.
03.02.20.00 - 03.02.30.00

NARRATION (VO) :

WHILE THE IDEAL STATE OF ANY MANUFACTURING
PROCESS IS TO "MAKE ONE, MOVE ONE," NOT EVERY
PRODUCTION LOT SIZE CAN BE "ONE".

SCENE 8.
#3182 06.13.19.00 - 06.13.29.00

NARRATION (VO) :

TO MEET CUSTOMER DEMANDS FOR SPECIALIZED
PRODUCTS, MANUFACTURING COMPANIES FOLLOW THE
CONCEPT OF AN "ECONOMICAL ORDER QUANTITY" TO
FIND THE BALANCE BETWEEN TOO LARGE OR TOO
SMALL OF A PRODUCTION RUN.

01.33.36.00 - 01.33.55.00

SCENE 9.
show the SHIGEO SHINGO book

NARRATION (VO) :

IN THE 1950S SHIGEO SHINGO HELPED DEVELOP A
METHOD FOR GREATLY LOWERING SETUP TIMES ON
LARGE STAMPING PRESSES. HIS IDEAS HELPED
COMPANIES MAKE DIE CHANGES IN MINUTES INSTEAD
OF HOURS.

01.03.54.00 - 01.04.04.00

#3181 05.22.05.00 - 05.22.11.00

SCENE 10.

NARRATION (VO) :

THE METHOD, SINGLE MINUTE EXCHANGE OF DIES, OR
SMED, WAS THE FOCUS OF AN INTENSE THREE-DAY
EVENT HELD AT PLYMOUTH TUBE IN WEST MONROE,
LOUISIANA.

01.19.49.00 - 01.20.06.00

SCENE 11.

NARRATION (VO) :

MANAGEMENT AT PLYMOUTH TUBE WORKED WITH THE

03.27.50.00 - 03.28.10.00

ASSOCIATION FOR MANUFACTURING EXCELLENCE TO HOLD THE THREE-DAY ORGANIZED EFFORT TO LOWER SETUP TIMES ON A TUBE-MAKING OPERATION. THE EVENT INCLUDED PLYMOUTH TUBE EMPLOYEES AND AME ATTENDEES FROM OUTSIDE COMPANIES WHO WANTED TO LEARN SETUP REDUCTION TECHNIQUES FIRST HAND.

02.01.05.00 - 02.01.30.00

SCENE 12.
02.12.39.00 - 02.12.56.00

NARRATION (VO) :

BUT YOU MAY ASK, "WHY WOULD 14 PEOPLE SPEND SEVERAL DAYS FOCUSED ON JUST ONE 20-MINUTE SETUP?"

SCENE 13.
02.20.29.00 - 02.21.08.00

NARRATION (VO) :

THEY DO IT BECAUSE THERE ARE ENORMOUS BENEFITS TO QUICK CHANGEOVERS. THEY INCLUDE...LOWER COSTS OF SETUP, RUNNING LESS INVENTORY, IMMEDIATE EXPANSION OF PRODUCTION CAPACITY, SHORTER LEAD TIMES, QUICKER RESPONSE TO ORDER CHANGES AND, IN SOME CASES, THE EVENTUAL ELIMINATION OF AN ECONOMIC ORDER QUANTITY, SO PARTS CAN BE PRODUCED IN LOTS SIZES OF ONE.

03.07.15.00 - 03.07.33.00

SCENE 14.
#3185 09.18.26.00 - 09.18.39.00

NARRATION (VO) :

SO, IF SINGLE MINUTE EXCHANGE OF DIES IS SO GREAT, WHY DO COMPANIES STILL MAKE BATCHES OF PRODUCTS? AND, WHAT CAUSES CHANGEOVERS TO TAKE SO LONG?

SCENE 15.
change color balance to sepia.
#3561 07.13.59.00 - 07.14.15.00

NARRATION (VO) :

WHEN YOU LOOK CLOSELY AT MOST CHANGEOVERS, THERE IS TYPICALLY A LACK OF ORGANIZATION. YOU

#3561 07.11.37.00 - 07.12.00.00

WILL SEE PEOPLE WALKING TO GET TOOLING,
LOOKING AROUND TO LOCATE FIXTURES AND SPECIAL
HARDWARE. SOMETIMES WHEN THEY LOCATE THE TOOL
IT IS BROKEN OR DULL, OR WORSE YET, THEY CAN'T
FIND IT AT ALL.

SCENE 16.
#3561 07.11.05.00 - 07.11.35.00

NARRATION (VO) :

OTHER TIMES THEY NEED TO WALK TO THE OFFICE
FOR SOME PAPERWORK OR GO BY THE STORAGE RACK
TO GET MORE MATERIAL.

SCENE 17.
#3182 06.10.07.00 - 06.10.32.00

NARRATION (VO) :

THEN AFTER EVERYTHING IS IN PLACE, ADJUSTMENTS
AND MEASUREMENTS MAY BE REQUIRED BEFORE THE
PRODUCTION RUN CAN BEGIN.

SCENE 18.
#3189 13.03.08.00 - 13.03.22.00

NARRATION (VO) :

BEFORE YOU KNOW IT, HOURS HAVE PASSED AND THE
MACHINE IS STILL NOT MAKING WHAT THE CUSTOMER
NEEDS.

SCENE 19.
change back to normal color levels
03.12.26.00 - 03.13.10.00

NARRATION (VO) :

THE EXPECTATION FOR THE EVENT WAS TO SPEED UP
THE CHANGEOVER PROCESS AT PLYMOUTH TUBE.

SCENE 20.
02.08.53.00 - 02.09.30.00

NARRATION (VO) :

02.09.32.00 - 02.09.48.00

THE TEAM OF PEOPLE BROUGHT TOGETHER FOR THE
SETUP REDUCTION KAIZEN WERE LED BY RICK
FELLER, CORPORATE MANAGER OF MANUFACTURING
EXCELLENCE, AND A LEAN TRAINER. HE HAD HIGH
EXPECTATIONS FOR THE KAIZEN EVENT.

SCENE 21.

Rick Feller on camera (during interview)

Rick Feller
Corporate Manager of Mfg. Excellence
Plymouth Tube

04.23.55.00 - 04.24.14.00

My expectation is that any time we have a setup reduction initiative, we ought to at least see a 50% reduction in setup time. Now, 50% may not be enough, maybe we will have to come back at another time and have another setup reduction event.

SCENE 22.
01.06.41.00 - 01.06.59.00

Rick Feller on Camera talking

Kaizen is two words in Japan. "Kai" means to take apart, understand and to break down the details of the current process. "Zen" is to religiously improve.

SCENE 23.

NARRATION (VO) :

01.55.21.00 - 01.55.50.00

DURING THE KAIZEN EVENT, THE TEAM WAS CHARGED WITH TAKING APART EACH ELEMENT OF THE CHANGEOVER. THEN TRYING TO FIND FASTER WAYS TO PERFORM THE TASKS.

SCENE 24.

NARRATION (VO) :

01.16.50.00 - 01.17.02.00

TO BEGIN, THE TEAM WAS TRAINED ON THE TYPES OF WASTE SO THAT A NEW STANDARD FOR CHANGEOVER COULD BE DEVELOPED. THE TEAM EXAMINED SEVEN TYPES FOUND IN MOST MANUFACTURING COMPANIES:
OVER-PRODUCTION
TRANSPORTATION
WAITING
PROCESS WASTE
INVENTORY
MOTION
AND DEFECTIVE PRODUCTS

CG:

Over-production
Transportation
Waiting
Process waste
Inventory
Motion
and Defective products

SCENE 25.
01.12.03.00 - 01.12.21.00

NARRATION (VO) :

TEAM RULES WERE SET TO MAXIMIZE THE GROUP'S EFFORT. TEAM MEMBERS WERE INSTRUCTED TO LISTEN

TO ONE ANOTHER, QUESTION EVERY ASPECT OF THE
CHANGEOVER, AND STAY OPEN TO NEW IDEAS.

SCENE 26.
01.10.51.00 - 01.11.15.00

Rick Feller on camera:

Consensus is the situation where everyone has a chance to have input. And we are going to actively solicit input from everyone on each team. We want to make sure we have everyone's ideas. Because even if the idea may not be the final answer that we choose, the idea might be something that someone else can build upon.

SCENE 27.
03.13.15.00 - 03.13.34.00

NARRATION (VO) :

THE TEAM ALSO FOCUSED ON DISCOVERING
SOLUTIONS, INSTEAD OF FINDING FAULT OR
COMPLAINING ABOUT WHY THINGS WOULD NOT WORK.

SCENE 28.
03.15.59.00 - 03.16.23.00

NARRATION (VO) :

DURING THE EVENT, THE LEADERS KEPT AN EYE ON
THE CLOCK TO STAY ON SCHEDULE. IT WAS
IMPORTANT TO MAKE SURE EVERY OPINION COULD BE
EXPRESSED, BUT TO ALSO KEEP THE DISCUSSION
MOVING FORWARD.

SCENE 29.
06.03.00.00 fun and laughter
06.03.12.00

NARRATION (VO) :

BY KEEPING A RESPECTFUL TONE TO THE
DISCUSSIONS AND NOT ALLOWING INTERRUPTIONS,
THE TEAM WAS ABLE TO REACH ITS GOALS AND EVEN
HAD SOME FUN IN THE PROCESS.

SCENE 30.
01.20.15.00 - 01.20.34.00

NARRATION (VO) :

BECAUSE TIMING IS SO IMPORTANT TO THE SETUP,
THERE IS A PRECISE DEFINITION OF WHEN THE
SETUP STARTS AND ENDS.

SCENE 31.
01.20.35.00 - 01.20.51.00

Rick on camera:
The very moment that we finish producing the

last piece of the first run, until we have set up and made all of the adjustments and we have been able to produce one good piece of the next run.

SCENE 32.
01.26.59.00 - 01.27.10.00

NARRATION (VO) :

NEXT, RICK TAUGHT THE GROUP THE THREE KEY ELEMENTS OF A SETUP.

SCENE 33.
#3181 05.24.40.00 - 05.24.47.00

NARRATION (VO) :

Clip ON W Drive use Woodward cruise footage.

FIRST IS PRE-STAGING AND ORGANIZING TOOLS AND MATERIALS. IN PRE-STAGING, YOU MUST HAVE A RACECAR PIT STOP MENTALITY WHERE EVERY SECOND COUNTS. THIS ELEMENT COULD TAKE 30 TO 60% OF THE TOTAL SETUP TIME.

SCENE 34.
#3181 05.22.25.00 - 05.22.41.00

NARRATION (VO) :

IN THE SECOND, THE ACTUAL PHYSICAL TOOL CHANGE TAKES PLACE. THIS USUALLY ACCOUNTS FOR ONLY 20 TO 30% OF THE CHANGEOVER TIME.

SCENE 35.
cranking the handle
#3182 06.10.10.00 - 06.10.27.00

NARRATION (VO) :

THE THIRD AND FINAL ELEMENT IS THE ADJUSTMENT TIME AND THIS CAN TAKE FROM 30 TO 50% OF THE SETUP TIME.

SCENE 36.
#3185 09.14.46.00 - 09.14.55.00

NARRATION (VO) :

BUT WHAT ARE SOME ACTUAL TECHNIQUES THAT CAN BE APPLIED TO SPEED THINGS UP?

SCENE 37.
#3188 12.06.53.00 - 12.07.07.00

NARRATION (VO) :

IN SOME CASES, CHANGING FROM THE USE OF A HAND TOOL TO A POWER TOOL CAN MAKE THE SETUP FASTER.

SCENE 38.

#3180 04.19.45.00 - 04.19.53.00

NARRATION (VO) :

POSITION MARKS OR LOCATION GUIDES ALSO CAN
SAVE TIME.

SCENE 39.

#3188 12.06.26.00 - 12.06.39.00

NARRATION (VO) :

TO AVOID WALKING, ALL TOOLING, GAGES, AND
OTHER SUPPLIES SHOULD BE STORED AS CLOSE TO
POINT OF USE AS POSSIBLE.

SCENE 40.

#3180 04.14.30.00 - 04.14.45.00

NARRATION (VO) :

HAVING COMMON HEIGHTS FOR DIE AND MOLD STORAGE
WILL MAKE HANDLING FASTER AND EASIER.

SCENE 41.

#3181 05.13.56.00 - 05.14.05.00

NARRATION (VO) :

DEPENDING ON THE MACHINE, SUPPLIERS OFFER
VARIOUS HARDWARE TO SPEED UP CHANGEOVERS.

HYDRAULIC OR SPRING CLAMPS,

SCENE 42.

Quick release jaws

Slotted washers

Unthreaded pins

#3180 04.19.58.00 - 04.20.13.00

NARRATION (VO) :

QUICK-RELEASE JAWS,

SLOTTED WASHERS,

UNTHREADED PINS

AND QUICK DISCONNECT AIR HOSES OR COOLANT
LINES CAN ALL SAVE TIME.

SCENE 43.

#3182 06.12.02.00 - 06.12.12.00

NARRATION (VO) :

USING VISUAL CONTROLS LIKE WHITE BOARDS AND
FLASHING LIGHTS WILL KEEP COMMUNICATION
FLOWING SO THAT EVERYONE CAN SEE WHAT IS
COMING, WHAT'S HAPPENING NOW, AND WHAT
HAPPENED ON THE LAST CHANGEOVER.

#3189 13.10.45.00 - 13.11.02.00

SCENE 44.

01.33.09.00 - 01.33.17.00

NARRATION (VO) :

BEFORE SHOWING HOW THIS TEAM IS GOING TO

01.33.26.00 - 01.33.34.00

LOWER SETUP TIMES ON THE DRAW BENCH AND BAR

WASH OPERATIONS, IT WILL BE USEFUL TO GET SOME

BACKGROUND ON PLYMOUTH TUBE.

SCENE 45.

03.03.27.00 - 03.03.39.00

NARRATION (VO) :

MOST OF THE PRODUCT MANUFACTURED BY PLYMOUTH

TUBE IS USED IN POWER GENERATION EQUIPMENT.

01.36.54.00 - 01.37.13.00

THIS HIGH-QUALITY, SMALL-DIAMETER, STAINLESS-

STEEL TUBING IS USED WORLDWIDE IN VARIOUS

APPLICATIONS OF FEEDWATER HEATER TUBING.

SCENE 46.

01.34.48.00 - 01.34.58.00

stage raw stock

NARRATION (VO) :

THE PRODUCT STARTS OUT AS FLAT STOCK ON A

01.35.16.00 - 01.35.25.00

COIL. IT IS THEN ROLL FORMED INTO A TUBE SHAPE

03.17.52.00 - 03.17.56.00

AND WELDED SHUT.

SCENE 47.

01.53.00.00 - 01.53.15.00

NARRATION (VO) :

AFTER THE TUBE IS FORMED, IT IS CUT TO LENGTH.

SCENE 48.

01.38.35.00 - 01.39.05.00

NARRATION (VO) :

THE NEXT STEP IS A SERIES OF OPERATIONS THAT

INVOLVE PULLING THE TUBE THROUGH A DIE TO

RESIZE THE OUTER AND INNER DIMENSION OF THE

TUBE.

SCENE 49.

01.36.08.00 - 01.36.20.00

NARRATION (VO) :

TO CONTROL THE INNER DIAMETER, A SPECIFIC SIZE

BAR IS PLACED INSIDE THE TUBE BEFORE IT IS

PULLED THROUGH THE DIE.

SCENE 50.

01.40.37.00 - 01.40.53.00

Heat treating video

NARRATION (VO) :

AFTER EACH DRAW OPERATION, THE TUBES NEED TO BE HEAT TREATED TO RELIEVE THE STRESSES BUILT UP DURING DRAWING. THE HEAT TREATING AND DRAWING STEPS ARE REPEATED AS MANY TIMES AS NEEDED TO MEET CUSTOMER REQUIREMENTS.

01.39.32.00 - 01.39.52.00

Show finished boxes of tubes.

SCENE 51.

01.32.49.00 - 01.32.57.00

NARRATION (VO) :

AFTER THE KAIZEN TEAM FINISHED INSTRUCTION ON THE METHODS OF SETUP REDUCTION, TEAM MEMBERS MOVED INTO ACTION.

SCENE 52.

03.03.49.00 - 03.04.15.00

01.55.21.00 - 01.5.40.00

NARRATION (VO) :

THE FIRST THING THE TEAM DID WAS TO GO AND SEE THE OPERATION. AFTERWARD, THE TEAM RETURNED TO THE CLASSROOM TO WATCH A 20-MINUTE VIDEO OF A CHANGEOVER PERFORMED THE DAY BEFORE.

SCENE 53.

02.04.36.00 - 02.04.50.00

02.19.09.00 - 02.19.28.00

03.02.12.00 - 03.02.20.00

NARRATION (VO) :

THE VIDEO RECORDING ESTABLISHED THE BASELINE STANDARD FOR PERFORMING THE SETUP ON THIS PARTICULAR OPERATION. PLYMOUTH TUBE FOLLOWS STANDARD METHODS FOR DOING WORK. AS WITH ALL IMPROVEMENT ACTIVITIES THERE, EMPLOYEES UNDERSTAND THERE MUST FIRST BE AN ESTABLISHED REPEATABLE STANDARD BEFORE ANY IMPROVEMENT CAN BE MADE. IF YOU DON'T HAVE STANDARDS TO FOLLOW, HOW CAN YOU KNOW IF THE NEW METHOD WILL BE AN IMPROVEMENT?

SCENE 54.

03.01.01.00 - 03.01.11.00

NARRATION (VO) :

IN THIS EXAMPLE, THE OPERATION INVOLVES A TWO-STEP PROCESS OF FIRST WASHING THE BARS, THEN RESIZING THE TUBES, SO BOTH STATIONS WERE VIDEOTAPED.

01.38.35.00 - 01.38.48.00

SCENE 55.

02.29.37.00 - 02.39.44.00

NARRATION (VO) :

THE TEAM BROKE INTO TWO GROUPS, ONE FOR THE BAR WASH STATION, THE OTHER FOR THE DRAW BENCH STATION.

02.29.50.00 - 02.29.57.00

SCENE 56.

02.15.09.00 - 02.15.15.00

NARRATION (VO) :

EACH GROUP THEN PAINSTAKINGLY EXAMINED THE ENTIRE 21-MINUTE SETUP. EACH ELEMENT WAS TIMED AND THE NUMBER OF SECONDS FOR EACH STEP WAS NOTED.

02.15.55.00 - 02.16.07.00

SCENE 57.

02.29.22.00 - 02.29.29.00

NARRATION (VO) :

THE BAR WASH STATION TEAM IDENTIFIED 19 DIFFERENT STEPS IN ITS PROCESS.

SCENE 58.

02.31.44.00 - 02.31.51.00

NARRATION (VO) :

THE DRAW BAR STATION TEAM FOUND 18 DIFFERENT STEPS TO ITS OPERATION.

SCENE 59.

02.04.29.00 - 02.04.55.00

NARRATION (VO) :

DATA WAS GATHERED BY CAREFULLY OBSERVING THE VIDEOTAPE. THE NEXT STEP WAS TO IDENTIFY IF EACH ELEMENT NEEDED TO BE DONE DURING THE SETUP OR IF IT COULD BE DONE BEFORE OR AFTER THE SETUP.

SCENE 60.
02.34.36.00 - 02.34.49.00
CG: EXTERNAL WORK

NARRATION (VO) :

IF ANY STEP IN THE PROCESS CAN BE DONE BEFORE
OR AFTER THE SETUP, IT IS CALLED EXTERNAL
WORK.

SCENE 61.
CG: INTERNAL WORK
03.43.14.00 - 03.43.25.00

NARRATION (VO) :

IF THE STEP CAN ONLY BE ACCOMPLISHED DURING
THE CHANGEOVER, IT IS CALLED INTERNAL WORK.

SCENE 62.
04.01.54.00 - 04.02.20.00

NARRATION (VO) :

IN THIS EXAMPLE, WORKERS CAN BE SEEN FILLING
OUT PAPERWORK DURING THE CHANGEOVER. THIS
TYPE OF TASK IS TARGETED TO BE MOVED FROM
INTERNAL TO EXTERNAL WORK AND SHOULD SAVE AT
LEAST ONE MINUTE.

SCENE 63.
Pan of Spaghetti diagrams
B4 and after

NARRATION (VO) :

OTHER TYPES OF WORK LIKE WALKING TO GET A WORK
TAG CAN BE ELIMINATED BY PRE-STAGING TAGS AT
THE WORKSTATION PRIOR TO STARTING THE RUN.
ADDITIONALLY, THE TIME AND DISTANCE WALKED IS
CAPTURED BY CREATING SPAGHETTI DIAGRAMS AND
TIME OBSERVATION CHARTS.

SCENE 64.
02.03.58.00 - 02.04.20.00

NARRATION (VO) :

TO FULLY UNDERSTAND WHAT IS HAPPENING ON THE
VIDEO, THERE MUST BE AN EXPERIENCED PERSON
VIEWING IT AND EXPLAINING TO THE TEAM WHAT THE
OPERATOR IS DOING.

SCENE 65.
04.33.34.00 - 04.33.44.00

NARRATION (VO) :

AT PLYMOUTH TUBE, VIDEOTAPING THE SETUP IS THE BEST WAY TO CAPTURE AND ANALYZE IT.

SCENE 66.
04.12.14.00 - 04.12.23.00

NARRATION (VO) :

ALTHOUGH ACTUAL OBSERVATION IS HELPFUL, THE VIDEO RECORDING CAN BE STOPPED, BACKED UP, REVIEWED AND SCRUTINIZED AFTER THE FACT.

SCENE 67.
03.17.10.00 - 03.17.23.00

NARRATION (VO) :

IF THE TEAM WAS JUST OBSERVING, TAKING NOTES, AND TIMING THE WORK, CHANCES ARE IMPORTANT STEPS MAY BE MISSED.

SCENE 68.
02.20.50.00 - 02.21.12.00

NARRATION (VO) :

DURING THE KAIZEN EVENT, IT WAS OBSERVED THAT 4 TUBES WERE PRODUCED DURING THE SETUP. AT PLYMOUTH, 4 TUBES HAVE ALWAYS BEEN MADE DURING THE SETUP TO MAKE SURE THE QUALITY WAS AS REQUIRED.

SCENE 69.
04.09.00.00 - 04.09.19.00

NARRATION (VO) :

BECAUSE OF RECENT IMPROVEMENTS IN THE QUALITY CONTROL OF THE INTERNAL BARS AND DRAW DIE MAINTENANCE, THE TEAM FELT THAT ONLY TWO BARS WOULD BE REQUIRED TO VERIFY THE TUBE DIMENSIONS.

SCENE 70.
02.38.15.00 - 02.38.24.00

NARRATION (VO) :

THE TIME ALLOTTED TO PULLING TWO TUBES WAS A LARGE TIME ELEMENT TO REMOVE FROM THE SETUP AND SAVED SEVERAL MINUTES.

SCENE 71.

04.13.45.00 - 04.13.56.00

NARRATION (VO) :

IN ADDITION TO THESE CHANGES, SOME OF THE
WORKLOAD OF THE WASH BENCH OPERATION WAS MOVED
OVER TO THE DRAW BENCH OPERATION.

SCENE 72.

04.12.44.00 - 04.12.56.00

NARRATION (VO) :

BY BALANCING THE WORKLOAD, THERE WAS LESS
WAITING AND THIS SPED UP THE CHANGEOVER.

SCENE 73.

03.03.51.00 - 03.04.06.00

NARRATION (VO) :

DURING THE KAIZEN EVENT, THE TEAM SPENT TIME
OUT ON THE FLOOR TALKING WITH THE OPERATORS
TRYING TO COME UP WITH IMPROVED METHODS FOR
THE CHANGEOVER.

SCENE 74.

04.01.32.00 - 04.01.45.00

NARRATION (VO) :

ON THE MORNING OF THE SECOND DAY, THE TEAM
VIDEOTAPED A TRIAL SETUP USING SOME OF THE NEW
METHODS.

SCENE 75.

Show Todd talking with Rick on the
shop floor

03.32.40.00 - 03.32.56.00

NARRATION (VO) :

SOME OF THE NEW METHODS WORKED FINE. BUT AT
FIRST GLANCE, OTHER IDEAS LIKE CHANGING THE
STORAGE LOCATION FOR SMALL SQUEEGEES APPEARED
TO NOT BE PRACTICAL. HOWEVER, THE TEAM

Show squeegees at point of use

03.10.10.00 - 03.10.30.00

CONTINUED WORK AND DETERMINED VALUE AND A
METHOD FOR STORING SQUEEGEES AT THEIR POINT OF
USE.

SCENE 76.

04.15.50.00 - 04.16.16.00

NARRATION (VO) :

BECAUSE THIS OPERATION INVOLVED TWO DIFFERENT

WORKSTATIONS, THE TEAM DECIDED TO SHOW BOTH VIDEO IMAGES ON A SINGLE SCREEN, SIDE BY SIDE.

SCENE 77.
04.04.49.00 - 04.05.02.00

NARRATION (VO) :

THE TEAM LOOKED FOR TIME WHEN ONE STATION HAD WAIT TIME AND THAT OPERATOR MIGHT BE ABLE TO ASSIST THE OTHER OPERATOR.

SCENE 78.
04.10.20.00 - 04.10.33.00

NARRATION (VO) :

SYNCHRONIZING THE TWO IMAGES WAS ACCOMPLISHED BY STARTING EACH RECORDING AT THE SAME TIME. DURING THE SETUP, CELL PHONES WERE USED TO COMMUNICATE THE START OF RECORDING.

03.41.08.00 - 03.41.18.00

OR, YOU COULD JUST USE YOUR 9 MM AND SQUEEZE OFF ONE OR TWO ROUNDS INTO THE CEILING TO GET THE TWO RECORDINGS TO START AT THE SAME TIME.

SCENE 79.
04.19.12.00 - 04.19.35.00

NARRATION (VO) :

AFTER ALL THE CALCULATIONS, DISCUSSION AND EXPERIMENTATION, BOTH GROUPS CAME BACK TOGETHER AND DEVELOPED NEW LISTS OF PROCESS TASKS AND HOW LONG IT WOULD TAKE TO PERFORM EACH STEP.

SCENE 80.
04.07.53.00 - 04.08.10.00

NARRATION (VO) :

BUT BEFORE THE STEPS COULD BECOME THE NEW STANDARD WAY TO DO THE SETUP, THE TEAM NEEDED TO PERFORM A SETUP USING THE NEW PROPOSED STANDARD WORK.

SCENE 81.
03.42.24.00 - 03.42.42.00

NARRATION (VO) :

ON THE MORNING OF THE THIRD DAY, THE TEAM
OBSERVED THE OPERATORS PERFORMING SUCCESSFULLY
TO THE NEW STANDARD METHODS.

SCENE 82.
04.47.14.00 - 04.47.24.00

NARRATION (VO) :

BASED ON THE TEAM'S DATA, THE SETUP TIME WAS
REDUCED FROM 21 MINUTES TO 11 MINUTES.

SCENE 83.
05.02.09.00 - 05.02.21.00

NARRATION (VO) :

BACK IN THE TRAINING ROOM, THE PLANT MANAGER
AND HIS MANAGEMENT TEAM JOINED IN TO HEAR A
SHORT REPORT-OUT ABOUT THE EVENT.

SCENE 84.
05.02.31.00 - 05.02.44.00

NARRATION (VO) :

ONE OF THE MACHINE OPERATORS PRESENTED THE
TEAM'S WORK TO THE GROUP TO DEMONSTRATE HIS
COMMITMENT TO THE NEW STANDARD.

SCENE 85.
POWER POINT GRAPH

NARRATION (VO) :

THE NEW SETUP TIME CHART SHOWS WHERE THE
IMPROVEMENTS WERE MADE AND HOW THE SETUP WILL
BE DONE IN THE FUTURE.

SCENE 86.
POWER POINT GRAPH

NARRATION (VO) :

EVEN THE FOLLOW-UP ACTIVITY DONE AFTER THE
EVENT WAS DOCUMENTED. THIS CHART SHOWS THE NEW
LOCATION OF A HAMMER. WHILE THIS SMALL
IMPROVEMENT ONLY SAVES A FEW STEPS, THIS IS
JUST THE TYPE OF IMPROVEMENT TO LOOK FOR.

SCENE 87.

NARRATION (VO) :

THIS AND ALL SETUP REDUCTION EVENTS FOLLOW

THESE STANDARD 10 STEPS:

- | | |
|-----------------------------------|---|
| A 03.06.24.00 - 03.06.30.00 | 1. IDENTIFY THE SETUP |
| B 04.10.24.00 - 04.10.33.00 | 2. OBSERVE AND LIST EVERY STEP. USE A VIDEO CAMERA TO RECORD THE PROCEDURE. |
| C 02.38.02.00 - 02.38.10.00 | 3. MEASURE THE TIME REQUIRED FOR EVERY STEP |
| D 02.38.24.00 - 02.38.28.00 | 4. DISTINGUISH INTERNAL AND EXTERNAL STEPS (INTERNAL STEPS ARE WHEN THE MACHINE IS STOPPED) |
| E chart | 5. CONVERT AS MANY INTERNAL STEPS TO EXTERNAL STEPS AS POSSIBLE. |
| F 04.01.54.00 - 04.02.10.00 | 6. REDUCE THE TIME FOR INTERNAL STEPS |
| G and H 01.26.36.00 - 01.26.47.00 | 7. REDUCE THE TIME FOR EXTERNAL STEPS |
| I 04.53.58.00 - 04.54.05.00 | 8. CREATE OR REVISE STANDARD WORK |
| J 01.14.58.00 - 01.15.06.00 | 9. TRAIN TO NEW STANDARD WORK |
| K chart | 10. PRACTICE AND IMPROVE. |
| L 03.11.37.00 - 03.11.43.00 | |

SCENE 88.
03.10.58.00 - 03.11.33.00

NARRATION (VO) :

WHILE MOST EMPLOYEES SEE THE BIG PICTURE AND UNDERSTAND THAT FASTER SETUPS ARE IMPORTANT, SOMETIMES ISSUES COME UP THAT SLOW DOWN PROGRESS.

SCENE 89.
Clyde Self
Manager of Mfg. Excellence
Plymouth Tube
04.29.16.00 - 04.29.39.00

Clyde on camera
Culture, and I would say culture of our people, our people are more open to changes than they used to be but we still see some resistance in thinking that we are doing it the best most efficient way we can.

SCENE 90.
Rick Feller
Corporate Manager of Mfg. Excellence
Plymouth Tube

The PARADIGM that some employees have had for years, we have always done it this way, we have tried it before and it has not worked so we know it's not going to work now, we have few

04.22.57.00 - 04.23.30.00

of those nay sayers, or people who are resistant to change. And we find that they can be overcome as long as we are engaging the other team members in those activities. It can be overcome if we can DEMONSTRATE the true value of change. And how it will not impact them NEGATIVELY. We are not going to make them work HARDER; we are going to make work easier for them.

SCENE 91.

03.14.32.00 - 03.14.41.00

NARRATION (VO) :

EVERY SINGLE DAY, COMPANIES WORLDWIDE HOLD THEIR OWN IMPROVEMENT ACTIVITIES TO BECOME MORE COMPETITIVE.

SCENE 92.

04.34.10.00 - 04.34.20.00

NARRATION (VO) :

RICK FELLER OFFERS UP THIS FINAL ADVICE FOR OTHER COMPANIES WHO ARE PLANNING SETUP REDUCTION KAIZEN EVENTS.

SCENE 93.

04.24.23.00 - 04.25.02.00

Rick Feller on Camera:

Make sure that you engage your team members, the team members who work in those areas who are the area experts. Make sure that you have a facilitator who understands the SMED process. And create a working environment where people feel good about participating, who want to learn, and who want to have involvement in making their performance improvements as well as their working conditions and their working life better.

SCENE 94.

CGS: credit roll
white text, fade up mid-screen,
black to blue gradient background

Manufacturing Insights wishes to thank the following contributors for their assistance in the production of this program:

Association for Manufacturing Excellence
Plymouth Tube Company

Produced By:

Society of Manufacturing Engineers

Copyright © 2008 Society of Manufacturing Engineers

Executive Producer:

Greg Sheremet

Producer/Director/Writer

Steven Bollinger

Cameraman:

Patrick Fitzpatrick