10 Steps to become a Lean Enterprise

Lean Expert Training Course
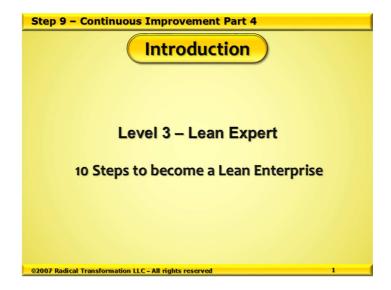
Step 9
Continuous Process Improvement

Part 4

Lean Expert Course Workbook – Step 9 Continuous Process Improvement Part 4

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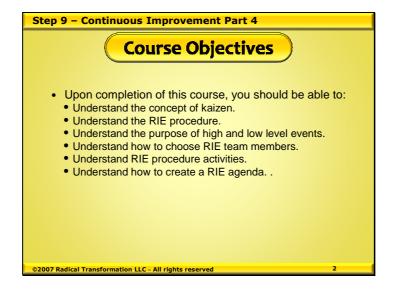
We would like to welcome you back to our next module in this online training course.

This training module is called "Step 9 – Continuous Improvement Part 4."

This module is a continuation of our Lean Expert online course series called "10 steps to become a Lean Enterprise."

This program has been specifically designed to demonstrate our step by step methodology that will allow any organization to become a Lean Enterprise.

Let's continue your lean journey!

Lean Expert Course Workbook – Step 9 Continuous Process Improvement Part 4
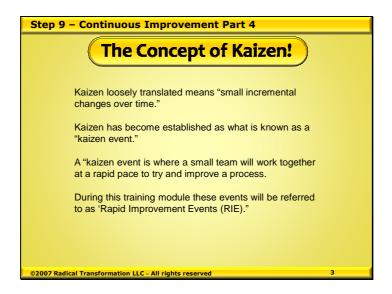
Course Objectives

Here are the course objectives for Step 9 – Continuous Improvement Part 4.

We specially designed this course to give the information you need to get a full understanding of each step required to become a Lean Enterprise.

Upon completion of this course, you should be able to:

- Understand the concept of kaizen.
- Understand the RIE procedure.
- Understand the purpose of high and low level events.
- Understand how to choose RIE team members.
- Understand RIE procedure activities.
- Understand how to create a RIE agenda.

Now we are going to work through each course objective.

Lean Expert Course Workbook – Step 9 Continuous Process Improvement Part 4

The Concept of Kaizen.

The Toyota Production System (TPS) incorporates the Japanese concept of "kaizen" into their continuous improvement process.

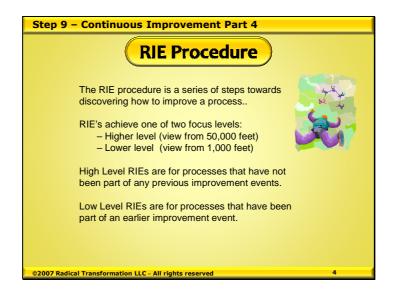Kaizen loosely translated means "small incremental changes over time."

When the Toyota Production System was first introduced to the west, the concept of kaizen became established as what we know today as a "kaizen event."

A "kaizen event is where a small team will work together over what is usually a 3 to 5 day period.

During this time, a team will participate in a rapid improvement event, which has a clearly defined procedure.

The procedure will differ slightly depending on which book you read or where you learn the process but for the most part, it follows a similar methodology.

In this training, we will refer to these events as 'Rapid Improvement Events (RIE)."

RIE Procedure.

The RIE procedure is a series of steps towards discovering how a process is performing currently and how it can be improved by identifying and eliminating waste.

RIE's achieve one of two focused levels:

– Higher level (view from 50,000 feet)

– Lower level (view from 1,000 feet)

High Level RIEs are for processes that have not been part of any previous improvement events.

It is a discovery event, where a team is trying to understand the business process from a higher or macro level.

The purpose for doing this type of event is to identify any potential areas for improvement within an organization.

The outcome of this event is to determine which strategic areas within an organization harbors opportunities for improvement.
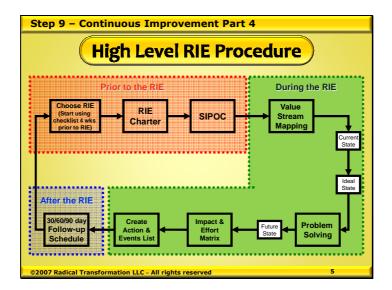
These will be identified and prioritized based on the strategic needs of the organization.

Low Level RIEs are for a process that was identified in a high level event or when a team completed a previous improvement event.

Information will be available about the processes involved in this type of event.

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The team will have access to this information to help them understand any of the previous improvements.

This is a micro level event where the team will work at a tactical or operational level inside an organization.

High Level RIE Procedure.

A High Level or 1st Pass event is typically used for a process that has not been included in any previous improvement procedures.

There will be no recent documented history of improvement available to a team.

Its purpose is to explore a high level process and identify any potential opportunities for improvement.

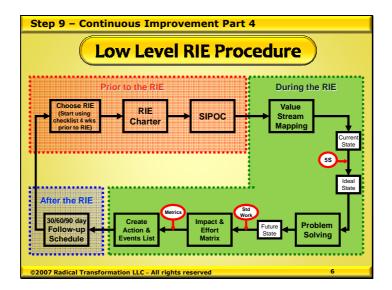These opportunities would eventually be prioritized and lead to team events.

If an organization is starting on its Lean journey, it would use a High Level RIE as part of their Strategy Deployment development procedure to determine where to focus their resources to deliver the best results.

In this screen, there is a diagram of the RIE procedure which has three levels:

1. Prior to the RIE   (in red)
2. During the RIE   (in green)
3. After the RIE   (in blue/gray)

The outcome for this type of event would be a list of focus areas with opportunities for improvement.

These opportunities for improvement will become future improvement events that look at a specific process in a work area.

Low Level RIE Procedure.

A Low Level or 2nd Pass event is typically used for a process that has been included in previous improvement events.

A recent documented history of any previous improvements would be available.

Its purpose is to take a small team through the procedure to identify and eliminate waste to improve a process.

This type of event is a micro or lower level view of a process.

It has the same three levels as the High Level event but includes some additional activities.

These activities are:

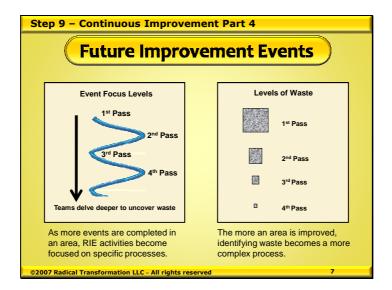- Workplace Organization which includes 5S & visual management.
- Standardized work documents.
- Process metrics.

The reason for including these additional activities is because a team is focused on a specific process in a work area that includes employees performing tasks, movement of information or materials, etc.

The outcome of this event would be:

- Current and Future State Value Stream maps

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- A Value Steam implementation plan with action items list.

- A 30/60/90 day follow-up schedule

- A list of defined improvements and potential savings

- Standardized Work

- Target metrics for the improved process.

Future Improvement Events.

Upon completion of a Low Level or 2nd Pass rapid improvement event the team will move to implement and then sustain the new method.

In the beginning the RIE team will identify the bigger, more obvious chunks of waste and eliminate them to improve the process.

However, every time an RIE team looks at the same process the waste identification and elimination process becomes more subtle.

It's like a helical series of improvement events, each pass or level has to delve deeper to uncover the waste.

In this screen, you can see two diagrams that represent these concepts.

The diagram on the left of the screen demonstrates the focus level of a process iteration based on the number of events.

The diagram on the right of the screen demonstrates how the identification of waste becomes more difficult or subtle as a team delves deeper after each iteration to improve the process.

These two diagrams also demonstrate how a process will be stabilized over time by implementing lean principles.

Cross Functional Team.

When choosing the team members for any RIE event, it's important to include employees from several different departments.

This allows the group of employees to become what is known as a cross functional team.

The purpose of having a cross functional team is to bring several different perspectives to the process.

It allows the team members to understand the issues from another person's viewpoint.

Traditionally there are four categories of employees included in RIE events:

1. **Department Manager**:

    They help to expedite the needs of the team members to make quick decisions.

    A manager would be able to get fast feedback from an executive leadership team about operational, financial, safety needs, etc.

    Managers are often chosen to be Project Champions and their responsibilities are to oversee the planning and execution of the RIE event.

    They will also be involved in any follow-up meetings.

2. **Facilitator**:

    This person would ensure that the team members are following each of the RIE steps during an event.

    They would give guidance to the team if they find themselves stagnating.

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3. **Area employees**:

    These employees work in the target area so they have a good understanding of their own needs.
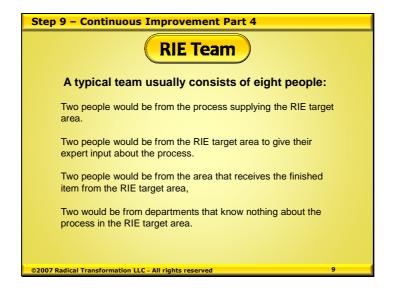
    They have a personal experience about the day to day problems in the area.

4. **Outside employees**:

    These employees are very important because they will probably have little to no prior knowledge of the target area processes.

    However, they bring fresh eyes to the event and are often able to see things that other people are blinded too.

    They are willing to be inquisitive and ask lots of questions which those who work in the area would consider silly or dumb.
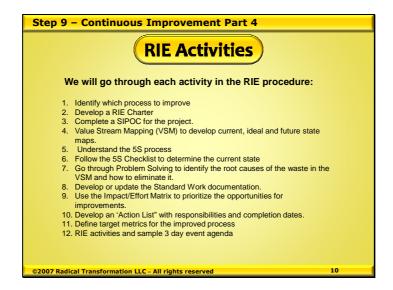
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RIE Team

A typical RIE team usually consists of approximately eight people.

The makeup of the team would consist of:

- Two people from the process supplying the RIE target area.

- Two people from the RIE target area to give their expert input about the process.

- Two people from the area that receives the finished item from the RIE target area.

- Two people from departments that know nothing about the process in the RIE target area.
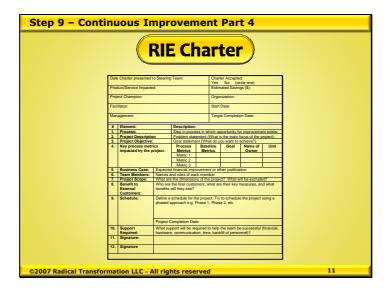
This type of structure or demographic would create an ideal cross-functional team.

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RIE Activities

In the following screens, we will take you through each activity in the RIE procedure:

1. Identify which process to improve.

2. Develop a RIE Charter.

3. Complete a SIPOC for the project.

4. Value Stream Mapping (VSM) to develop current, ideal and future state maps.

5. Understand the 5S process.

6. Follow the 5S Checklist to determine the current state.

7. Go through Problem Solving to identify the root causes of the waste in the VSM and how to eliminate it.

8. Develop or update the Standardized Work documentation.

9. Use the Impact/Effort Matrix to prioritize the opportunities for improvements.

10. Develop an 'Action List" with roles, responsibilities and completion dates.

11. Define target metrics for the improved process.

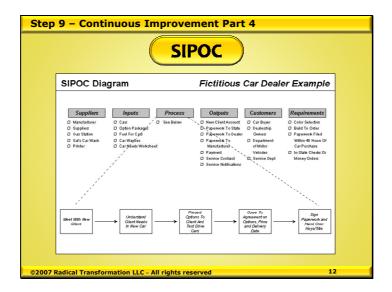12. RIE activities and sample 3 day event agenda.

RIE Charter

A RIE charter defines the problem, purpose and resource requirements for an event.

It is a document that is presented to a management or CPI steering team to determine if an event is viable.

A team would complete a RIE Charter for every event.

A typical charter will contain the following information:

- Identify the project or event.

- Identify the purpose of the event.

- Identify the Project Champion.

- Define the Problem Statement.

- Define the goal of the event.

- Identify any current metrics used.

- Identify the Team Leader.

- Identify the Facilitator.

- Identify the team members.

- Determine the event date(s).

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SIPOC Diagram.

In this screen, is an example of a "SIPOC" diagram, which is also known as a "COPIS" (SIPOC reversed) diagram.
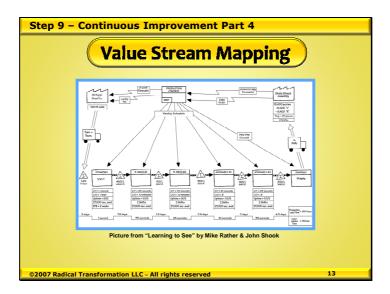
This is SIPOC in reverse. It is a very useful tool to allow a team to start to think systemically about the processes in a work area.

A SIPOC can be used to lay the ground work for a Value Stream Mapping exercise.

It will help to identify any data needs for the VSM process.

SIPOC diagrams are very easy to complete. Here are the steps to follow:

1. Draw the Process Map. Keep it at a high level, no more than 4 or 5 high level process boxes
2. Identify and list the Outputs from this process.
3. Identify the Customers who receive the Outputs from this process.
4. Identify the Inputs required for the process to function properly.
5. Identify the Suppliers of the Inputs that are required by the Process.
6. Verify the SIPOC with the Project Champion and stakeholders.

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Picture from "Learning to See" by Mike Rather & John Shook

Value Stream Mapping.

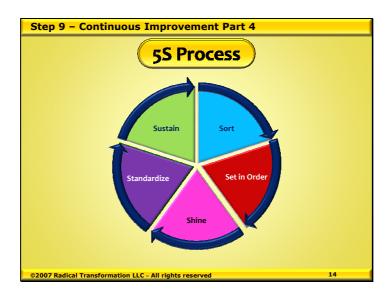You can use the SIPOC to draw Current and Future State Value Stream Maps.

The steps for drawing a value stream map are:

1. Draw the material flow (Supplier to Customer).
2. Draw the data boxes and add the data.
3. Draw the information flow (Customer to Supplier & Internal Information flow to each operation).
4. Identify amount of inventory in front of each operation.
5. Define Customer delivery requirements. Calculate Takt Time
6. Complete the Production Lead Time and Cycle Time timeline.
7. Identify the waste in the current state and eliminate it to create a Future State Map.
8. Create a VSM implementation plan.

Note: The team has been empowered by management to develop and implement the best possible improvements during the event.

This was made clear during the presentation of the RIE Charter to the management or CPI steering team.

See Step 2 – Value Stream Mapping for more detailed information.

5S Process.

After mapping the process carry out a 5S of the work area before proceeding further:

1. Sort — Separate necessary from unnecessary items.
2. Set in Order — Create a defined location for all necessary items.
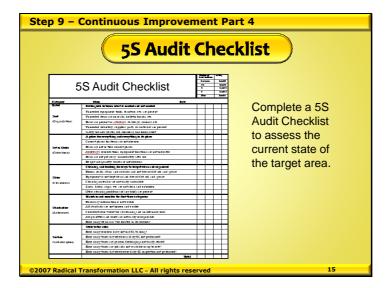3. Shine — Inspect necessary items through cleaning.
4. Standardize — Make steps 1, 2 and 3 a daily habit in all areas.
5. Sustain — Implement systems to the sustain 5S process.

This process will allow the work area to be re-organized to demonstrate what it should look like each and every day.

See Step 2 – Workplace Organization for more detailed information.

5S Audit Checklist.
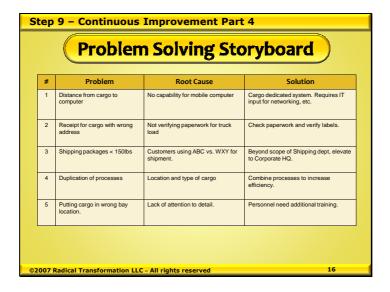
A team should complete a 5S Audit Checklist to assess the current state of the target area before any changes are implemented.

A final assessment will be completed after the event to determine if the work area was improved and by how much.

The audit checklist will be a standardized document that is used during the "Sustain" element of the 5S system.

This ensures that the work area is being consistently improved and not reverting back to how it was before completing a 5S process during the RIE.

See Step 2 – Workplace Organization for more detailed information.

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Step 9 – Continuous Improvement Part 4

Problem Solving Storyboard

#	Problem	Root Cause	Solution
1	Distance from cargo to computer	No capability for mobile computer	Cargo dedicated system. Requires IT input for networking, etc.
2	Receipt for cargo with wrong address	Not verifying paperwork for truck load	Check paperwork and verify labels.
3	Shipping packages < 150lbs	Customers using ABC vs. WXY for shipment.	Beyond scope of Shipping dept, elevate to Corporate HQ.
4	Duplication of processes	Location and type of cargo	Combine processes to increase efficiency.
5	Putting cargo in wrong bay location.	Lack of attention to detail.	Personnel need additional training.

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Problem Solving Storyboard.

A team can use the Value Stream Map to identify the problems/issues.

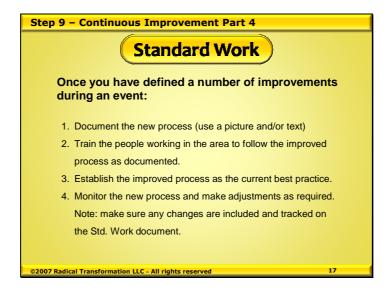A method used to present these problems/issues is to develop a Problem Solving Storyboard.

The steps for doing this are:

1. Identify and add all of the Problems/Issues to the document.
2. Collect data for each problem.
3. Analyze the data to identify the root cause.
4. Brainstorm for solutions to eliminate the root cause.
5. Prioritize the implementation of solutions using an Impact/Effort Matrix.
6. Develop an implementation plan for prioritized solutions.

The Problem Solving Storyboard in a simple method of documenting and tracking the issues, root causes and solutions.

Some teams would prefer to use an A3 to document each problem during this process.

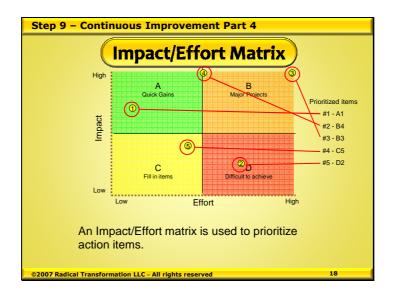See Step 9 – Continuous Improvement Part 3 for more detailed information.

Standard Work

Once an implementation plan has been developed that identifies the number and order of the process improvements identified during an event, it is important to document the new method.

Here are the steps to develop a standardized work document:

1. Document the new process.

2. Use a combination of picture and text to create a visual document that is easier to understand.

3. Train the people working in the target work area to follow the improved process as defined in the document.

4. Establish the improved process as the current best practice.

5. Monitor the new process and make adjustments as required.

Note: make sure any changes are included and tracked on the Standard Work documents.

See Step 8 – Standardized Work for more detailed information.

Impact/Effort Matrix

An Impact/Effort matrix is used to prioritize action items.

Impact means the level of improvement to the organization financially, systemically, etc.

Effort means all of the resources required to implement the improvement i.e. time, money, people, etc.

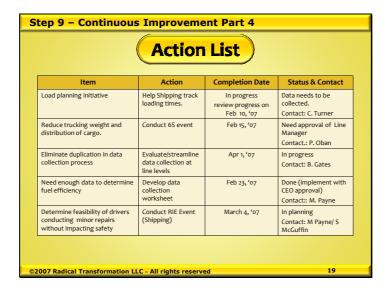The steps for using the Impact/Effort Matrix are

1. Take each problem solution and determine its Impact on the process.
2. Next determine the Effort required to implement the problem solution.
3. Prioritize the implementation based on where they are located on the matrix.

Quadrant A - High Impact/Low Effort items are urgent and important. They will deliver quick gains so they should be completed ASAP.

Quadrant B - High Impact/High Effort items are major projects. They often need inputs or support from outside of the organization i.e. corporate, customers, etc. These items will need project management to ensure they are staying on track.

Quadrant C - Low Impact/Low Effort items are important but not urgent. These should be completed when nothing else is available to work on in Quadrants A or B.

Quadrant D - Low Impact/High Effort items are very difficult to complete because there is very little improvement or pay back for the amount of effort required.
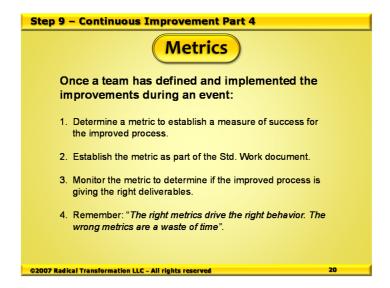
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Action List

Use the information from the Problem Solving Storyboard and Impact/Effort Matrix to create the action list.

The steps for creating an action list are:

1. Determine what actions are required to implement the process improvements.

2. Identify specific actions and add them to the list.

3. Determine an acceptable Estimated Completion Date (ECD).

4. Determine who will be the contact person and take responsibility for completion of an action item.

5. Determine the status of each action item i.e. Completed, Not started, 25%. 50%, etc.

6. Schedule a follow-up meeting to determine the status of each action item.

The action list is for project management to ensure the action items are executed as required to complete the implementation of the improvements.

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<u>Metrics</u>

Once a team has defined and implemented the improvements during an event, they can develop metrics.

The steps are:

1. Determine a metric to establish a measure of success for the improved process.

2. Establish the metric as part of the Standard Work document to define what is required from the work area employees.

3. Monitor the metric to determine if the improved process is generating the right deliverables.

4. Remember: "*The right metrics drive the right behavior. The wrong metrics are a waste of time*".

Establishing effective performance metrics is vital for the success of any process.

The saying is true, "If it can't be measured, it can't be managed".

A process that is not being measured is not being managed effectively to deliver what the customer wants, when they want it.

How it is possible to know this is true?

It is true because a process that is not measured can only be managed based on opinion, not data.

See Step 1 – Strategy Deployment Part 4 for more detailed information about metrics.

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Step 9 – Continuous Improvement Part 4			
Sample 3 Day RIE Agenda			
#	**RIE Activities**	**Hours**	**Day**
1	RIE orientation for all team members	2	1
2	Data collection – Time studies, Travel diagrams, Layouts, etc.	2	
3	Analysis of data:	2	
4	5S – Sort (Separate, red tag & remove unnecessary items)	1	
5	RIE team member update each other on first day progress	1	
6	5S – Set in Order & Sweep (All team members are involved)	3	2
7	Visual Management (Determine signs, lines, markings, etc.)	2	
8	Identify process improvements and implement.	2	
9	Leadership review (RIE team brief management team)	1	
10	Continue implementation of process improvements	2	3
11	Monitor changes to process	1	
12	Adjust & update process	1	
13	Prep for Final Presentation	2	
14	Leadership presentation & responsibility for action items	2	
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Sample 3 Day RIE Agenda

In this screen, is an example of an agenda for a 3 day event. It clearly demonstrates how all the activities during the event are planned and have been allocated time to complete them.

An event agenda is a guide to help a facilitator and the team members to follow a standard format for conducting an event.

Sometimes the timeframe will slip with items taking a little longer and some not needing as much time.

The management reviews are a very important part of the event process. It allows the team members to update the management team about their discovery process and findings.

It gives the management team a chance to ask questions about what the team is doing and how they arrived at their findings.
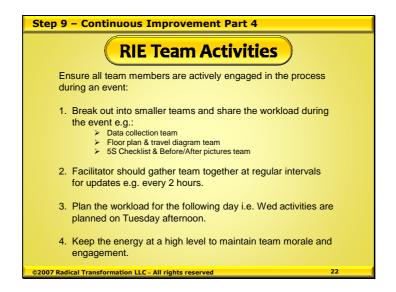
Sometimes the managers will be able to give the team additional information about a process that will help them.

However, it is not a place for a manager to take control of the event, or discredit the findings of the team or challenge the team's motives.

At the end of the final day of the event the team members will give a final presentation about their event activities and results to the management team.

The team will have created an action item or a "to do" list for items that need to be done to implement the improvements.
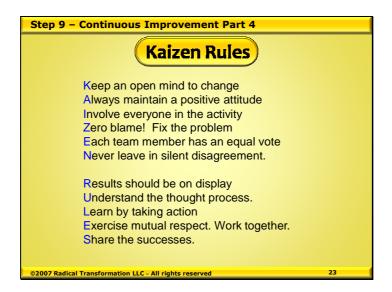
The management team will identify individuals and give them the responsibility of following up and ensure the action items are completed by a specific date.

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RIE Team Activities

It is important for a facilitator to ensure all the team members are actively engaged in the process during an event:

1. Break out into smaller teams and share the workload during the event e.g.:

   - Data collection team

   - Floor plan & travel diagram team

   - 5S Checklist & Before/After pictures team

2. Facilitator should gather the team members together at regular intervals for event updates e.g. every 2 hours. This ensures everyone is aligned and working towards the same goals.

3. Plan the workload for the following day i.e. Wed activities are planned on Tuesday afternoon. Bring the team together to complete this before they leave the facility. Make it a habit to go into the next day with everyone knowing what they need to do. This way they will be able to start working as soon as they arrive at the facility and without the facilitator having to tell them what to do.

4. Keep the energy at a high level to maintain team morale and engagement.

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Kaizen Rules

In this screen, is a list of procedural requirements to be followed during an event.

They are to create a foundation for the mutual respect and equal treatment of all team members.

Each one is part of the first letter of the phrase **KAIZEN RULES**.

K - Keep an open mind to change

A - Always maintain a positive attitude

I - Involve everyone in the activity

Z - Zero blame! Fix the problem

E - Each team member has an equal vote
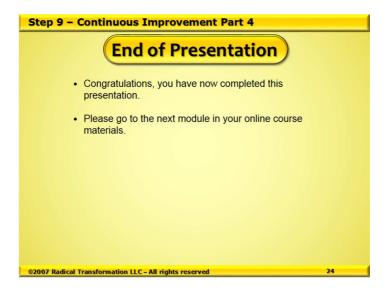
N - Never leave in silent disagreement.

R - Results should be on display

U - Understand the thought process.

L - Learn by taking action

E - Exercise mutual respect. Work together.

S - Share the successes.

<u>End of Presentation.</u>

Congratulations, you have now completed this presentation.

Please go to the next training module in your Lean Expert online course materials.

Reference Materials

1. **Kaizen for the Shop Floor:**

   By: Productivity Press Development Team. Published by Productivity Press 2002.

2. **The Lean Pocket Handbook for Kaizen Events – Any Industry – Any Time:**

   By Don Tapping, Stephen Tapping and Jody Williams. Published by MCS Media 2007.

3. **Kaizen Event Implementation Manual, 5th Edition:**

   By Geoffrey Mika. Published by Society of Manufacturing Engineers 2006.

Documents List

There are no documents required for this training module.