



Implementation Manual - 4

Kobetsu Kaizen

Qs. 1 What is the role of KK sub-committee ?

KK sub-committee has a team of upto 7-8 members in a large company representing the heads of different departments and the chairman is usually the Plant Head. The committee has following roles:

Recording, categorizing and analysing 16 losses(except break down and defect loss) machine-wise, department-wise, unit-wise and company-wise

: Calculation/Analysis of OEE and set targets for minimizing/eliminating each loss. In some cases, companies are also including specific losses that affect their business. In other words the formula for OEE may be different at different stages of TPM in a company and specific to the constraints a company may have

Based on business need, set priorities on losses and projects looking at resource constraints.

Selecting Kaizen themes based on losses, setting targets and assigning teams to take responsibility for each identified project.

: Identify bottleneck areas, fix targets and set priorities

: Launching of project teams with pilot projects

Helping all support functions to arrive at the Loss vs. cost matrix and the P,Q,C,D,S,M measures.

Identifying aim and scope of KK, training requirement and guiding the facilitators to focus losses on company performance.

Knowledge sharing through horizontal deployment activities

Develop the Master plan for KK and track progress of Kaizens and OEE

Motivate people to do Kaizens.

Giving inputs to the education and training pillar for training matrix development.

Working in close co-ordination with other sub-committees for achieving the PQCD SM targets. This committee will meet at least once a week or month for the above mentioned points.



Qs. 2 Which losses to be addressed by KK ?

KK pillar deals only with those losses that cannot be handled by any other pillar. All 16 losses have to be considered by the KK committee and make up the loss structure for the company. (Losses due to defect/rework losses through Quality Maintenance, failure losses through Planned Maintenance).

Next, the KK sub-committee will identify the priorities and assign project teams to work on specific losses on different machines and areas.

Remaining losses will have to be addressed by KK sub-committee. Usually, they address the following losses:

Each company has to make up their list and collect data. The highest losses will be the priority for the KK pillar. In some companies this list may be different. This is only an example:

Loss no. 2: Set-up

Loss no. 3: Tool change

Loss no. 4: Start-up loss

Loss no. 5: Minor stoppages

Loss no. 6: Reduced speed

Loss no. 9: Management Loss

Loss no. 10: Operating motion loss

Loss no. 11: Line organization loss

Loss no. 13: Measurement and adjustment loss

Loss no. 15: Tools, jigs and consumables loss

Loss no. 16: Yield loss.

Major three losses can be prioritized in each area to start the work.

Qs. 3 What is the role of operators in Kobetsu Kaizen ?

Be a member in small groups/circles and participate in circle meetings.

Improve and sustain 1 's' and 2 's' to eliminate search time losses.

Identify losses by identifying abnormalities.



E.g. SET_UP time reduction: operators take part in the study of videos taken during set-up activity. They discuss, give ideas and contribute for Kaizen developments in fixing, eliminating and reducing elements in setting.

E.g. Reduction of tool change time. Operators detect and inform the early wearing out of tools, and contribute to extending their tool-life.

Provide inputs for quantifying management losses.

Operators to maintain results by following standards built up by PM and JH pillars which includes generating OPL's.

They must assist the KK team to make trials and implement Kaizens when proposed by all pillars.

Qs. 4 What training is required for doing KK ?

Training to cover:

- Training on 16 losses
- Calculating costs
- Why-why analysis
- PM analysis
- Machine structure/Principle of working
- SMED and setup reduction training
- Tool technology
- 3Ms(Muri, Muda, Mura)
- FMEA, FTA, and other analytical techniques
- OJT, OPL
- Industrial engineering and JIT concepts
- Poka Yoke/fail-safing
- QC tools and story board
- Training operators to collect data.



Qs. 5: How to set P,Q,C,D,S,M targets for KK?

Collect data for previous one year before kick-off. KK committee looks at P, Q, C, D,S, and M at the company level and selects areas under each category.

(E.g.)

P – Productivity/production increase by

- Improvement in OEE of machines

- Improvement in attaining effective man-hours

- Improvement in labor productivity

Q – To bring defects to zero

By analyzing

- Customer complaints & warranty returns

- In-house rejections

- In-house rework

- Incoming material rejections

C – Cost reduction through

- OEE increase

- Cycle time reduction in bottleneck machines

- Reduction of inventory on cutting tools

- Reduction in consumption of cutting oils

- Enhance tool life

D – To maintain delivery performance through

- OEE increase

- Improve bottleneck machine/process

S – To achieve zero accident level

- By providing training on Machine operations



Identifying unsafe actions and locations and taking corrective actions to avoid Accidents.

Motivation of operating personnel through Involvement and participation

Analysis of accidents happened in the past and near miss accidents through why-why analysis and improves working conditions.

M – To improve morale of operators through

Involvement and participation in circle activities

By encouraging to generate Kaizens and rewarding for suggestions/improvements carried out.

Usually at least a 5% cost(variable) reduction target should be set as a company objective.

Set target for OEE and then set target for P, Q, C, and D.

In some case P targets are set using Takt time calculation or 1.5 times current production to achieve in 3 years time.

Q targets are set in PPM range and warranty, based on last three-year trend. (Q)

D target is set for own delivery to customers and also for supplier's performance.

Target for safety is zero accidents. Eliminate unsafe actions and locations, and make hand injury zero in the first year.

Target for M is in line with suggestion scheme and any other schemes the organization has like QCC etc.

The company level targets are deployed down to product-wise and from there on to specific lines and machines.

Qs. 6 How to prioritise losses for KK ?

Prioritising losses to be based on

1. Analyse the losses that affect OEE.
2. No. of occurrence and time losses
3. Type of losses(sporadic or chronic)

Quality and failure losses are not covered here.



Losses for each machine are calculated and the priority set for bigger losses by value. A flowchart shows how losses can be categorized and then prioritized (**Flow Chart attached as Annexure 1**).

Qs. 7: How to collect KK related losses ?

Machine-wise all 16 losses are calculated.

OEE related(8) losses are collected from Production and Inspection records.

Cost related losses-spare, coolant, lubricants are collected by maintenance department and tool losses from the tool crib or tool management center. Vendor related Quality Maintenance team, and, management loss by office TPM team report losses. Operating motion loss and line organization loss by Industrial engineering. Logistic loss is by Office TPM team.

Losses are compiled by the KK team into the loss structure matrix.

(see **Annexure 2**)

Qs. 8: How to make master plan for KK ?

After collecting losses and prioritizing them, an action plan is drawn up area and machine wise. Based on current status as bench-mark and fixing targets:

1. For OEE improvement in
 - Model machines
 - Rank A machines
 - Other machines
2. Productivity Improvements
 - Cycle time reduction
 - Man-hour utilization

Project teams/circles are selected and targets on results and time frame agreed upon.

The KK master plan is aligned to the Overall master plan. (**See Annexure 3**).



Qs. 9: How to make Project teams for all losses?

Cross-functional teams with relevant knowledge

Teams structure should be in a way so that cascading/horizontal deployment can be as fast as possible.

Vested interest/affected parties are put in KK teams/Project teams.

1. The losses must be taken based on priorities
2. Particular process or machine is selected for study to reduce the losses.
3. Unit/department head where the particular machine/process is taken for study should be the leader and members are drawn from production, tool room, tool design, production engineering, quality etc. depending upon the requirements.
4. Once the model project team is formed they should collect all relevant datas on losses they aim to bring down/eliminate.
5. The action plan is to be drawn with activities, time target, person's responsibilities to carryout the task, supporting help/facilities needed to carryout the task etc.
6. To monitor the program meetings conducted at determined frequency on the shop floor/site. The necessary help can be drawn from other units/departments and even from external source.
7. The team should prepare the plan and obtain the concurrence from management/top officials. Once the target and results are achieved this can be extended to other departments/units.
8. On successful completion of the project, various teams can be formed throughout the company for elimination of different losses

Qs. 10: How to cover all losses by involving all people?

1. Once the losses are identified, they can be prioritized depending in occurrence and time loss.
2. The losses can be classified and allocation to be done to unit-wise/machine or process-wise.
3. Monitoring is to be done by leaders and members of each pillar among with manager of concerned production unit/supervisor depending on importance, time



target, technology and cost involved.

4. Periodical meetings to be conducted to review improvements made through Kaizens or suggestions. Kaizens to be carried out and reduction in losses to be recorded.

Qs. 11: How to sustain design changes in KK?

KK sub-committee should involve in introduction of new product or change in existing product. The following are to be considered as an example:

Design of fixture/tools to minimize set-up time from one part to another

Cutting blade change time must be minimum

To minimize motion loss

Balancing of cycle time to avoid line organization losses

Design changes should be easily adopted with the shortest lead-time.

Product design to take care of:

The use of existing toolings

Commonisation with similar product.

Updation in design records

Feedback to development management

Feedback to OEM

Feedback to Machine manufacturer

Feedback to equipment design/capital planning and procurement team.

Through Poka Yoke, training and visual/audio instructions on machines

Through tentative standards of step 3 of JH.

Through PM standards.

(For standards to be used, it is essential to establish them involving the operators, then operators must be trained on the SOP and the usage monitored.)



Qs. 12: How to do cost-benefit analysis through KK?

Analyse data available on each loss.

Categorise losses on

Loss of production

Loss of man-hours

Loss of material

Loss of energy

Cost benefit is calculated by evaluating payback periods.

E.g.: Loss on changeover time.

M/c: MW12, Cell- 1(Aluminum), Unit: Actuation. Cell hour rate: Rs. 4,000/-

Current changeover time= 4 hrs/changeover

Reduced changeover time = 1 hr/changeover

No. of changeovers in a month =10

Total hours saved = 30 hours/month

Gross saving is at the rate of Rs. 4000/- adding up to = Rs. 1.2 lakhs

Amount spent per variety for achieving reduced changeover = Rs. 2500/-

Total amount spent= Rs. 25,000/-

Payback period = 0.2 months.

Loss cost matrix(see example):



LOSS-COST MATRIX

FOR A RANK MACHINES (Prepared the Same in Excel)

DATA(IN RUPEES) for the period(Jan-June)

S. No	Cost	Material Cost		Energy /fuels		Spares	Tools	Consumables	Man Hours				Transportation
	Losses	Incoming matl.	Inprocess rej.	Furnace oil	Power				Production.	Maint.	Quality	Supr.	
1.	Breakdown												
2.	Set-up												
3.	Tool change												
4.	Start-up												
5.	Shut-down												
6.	Management												
7.	Motion												
8.	Line org.												
9.	Distribution												
10	Meas. & adj.												
11	Minor stopp.												
12	Speed												
13	Defect/rew.	39001	41925										
14	Energy												
15	Yield												



Qs. 13: How to reward Kaizens?

Monetary awards:

Spot award given for every Kaizen submitted, implementable ones will enable a Rs. 100/- award to the suggester, and after implementation, an award of 10% of annual saving(max. of Rs. 20,000/-)

Non-monetary awards:

Grading against P,Q,C,D,S,M is done for proportionately rewarding Kaizens.

Monthly Kaizen meetings to boost the morale of good Kaizens. Awards are announced in common forums addressed by ED/Department/Unit heads.

Presented Kaizens are displayed in common places with photographs of the Kaizen team who have done the best Kaizen for the month is displayed in all units. Rolling trophy for the best Kaizens

Top 3 Kaizens of each quarter will be published in the house journal.

No monetary rewards but certificates from CEO, individual recognition through photographs on notice boards are a better approach.



Manual No.4 : KOBETSU KAIZEN IMPLEMENTATION

The TPM Club India, CII acknowledges the contribution of all the following 41 companies who added great value in sharing their experience of TPM Implementation. This manual is the fourth in the sequence of others to come, covering *Office TPM* in this year

1	Aditya Cement	22	Mahindra & Mahindra Limited - Auto
2	Bajaj Auto Limited	23	MM Forgings Limited
3	Bharat Seats Limited	24	Mother Dairy
4	Birla Tyres	25	QH Talbros Limited
5	BPL Limited PTI	26	Shriram Pistons & Rings Limited
6	Brakes India Limited, Brakes Div.	27	Sona Koyo Steering Systems Limited
7	Brakes India Limited, Foundry Division	28	Sundaram Brakelinings Limited
8	Brakes India Limited, Padi	29	Sundaram-Clayton Limited
9	Brakes India Limited, Pollambakam	30	Tata Cummins Limited
10	Clutch Auto Limited	31	Tata Metaliks Limited
11	Electrosteel Castings Limited	32	The Tata Iron & Steel Co. Limited - Steel
12	Heavy Alloy Penetrator Project	33	The Tata Iron & Steel Co. Ltd. - Bearings
13	Hindustan Lever Limited	34	Thirumalai Chemicals Limited
14	Hi-Tech Carbon	35	TTK-LIG Limited
15	Indian Oil Corporation Limited	36	Tube Products of India
16	Indo Gulf Corporation Limited (Fertilisers)	37	Usha Beltron Limited - Cable Division
17	Jay Yuhshin Limited	38	Usha Beltron Limited - Alloys & Steel
18	Jindal Strips Limited	39	Usha Martin Industries
19	Lakshmi Auto Components	40	Vikram Cement
20	Lakshmi Machine Works Limited	41	Vikram Ispat, Salow
21	Lucas TVS - FIE Division		

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Senior Counsellor
TPM Club India