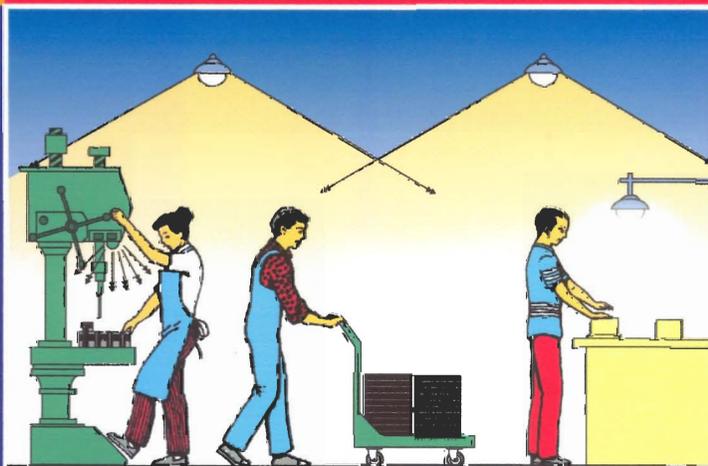




International  
Labour  
Office

# WISE



Work Improvement in Small Enterprises

**PACKAGE FOR TRAINERS**



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**International  
Labour  
Office**

# **WISE**

**Work Improvement in Small Enterprises**

**PACKAGE FOR TRAINERS**

Supported by  
ILO/Japan Multi-Bilateral Programme

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## **PREFACE TO THE SECOND EDITION**

Seven years have passed since the first edition of the WISE Trainers' Package was published in the Philippines as a product of the Work Improvements in Small Enterprises (WISE) project. The WISE project in the Philippines was undertaken with the financial assistance from the United Nations Development Programme (UNDP) and technical support from the International Labour Organization (ILO) and was successfully completed in 1997. Since then, WISE has been spreading to other Asian countries and playing dynamic roles in helping employers and workers of small enterprises to improve their working conditions and productivity. WISE training courses have been carried out in Cambodia, People's Republic of China, Indonesia, Japan, Republic of Korea, Lao PDR, Malaysia, Mongolia, Thailand, and Vietnam for small enterprises, which have improved their working conditions and productivity.

The WISE Trainers' Package is increasingly valuable to support the growing number of WISE trainers and organizers in Asia. Practical tips to organize and undertake successful WISE training courses are presented with many clear illustrations. This second edition of the WISE Trainers' Package is based on and follows the structure of the first edition. We appreciate the intellectual contribution of Department of Labor and Employment (DOLE), the Philippines and their collaborators in preparing the first edition. It also refers closely to the ILO Action Manual on Higher Productivity and a Better Place to Work (ILO 1988) authored by J. E. Thurman, A. E. Louzine and K. Kogi. Thus we are indebted to many individuals and institutions involved in the development of the ILO Action Manual.

The following people worked together to develop the second edition of the WISE Trainers' Package: Dr. Tsuyoshi Kawakami and Dr. Yuka Ujita, ILO Subregional Office for East Asia, Bangkok; and Mr. Prerksapob Poontawesuke, ILO/Japan Multi-Bilateral Programme, Bangkok. Special thanks are due to Mr. William Salter, Senior Advisor, Conditions of Work and Employment Programme, ILO, Geneva for his valuable advice and support. The revision was carried out with the financial assistance of the ILO/ Japan Multi-Bilateral Programme.

I strongly hope that this second edition of the WISE Trainers' Package will be widely used for further expanding WISE to assist more small enterprises.

Christine Evans-Klock  
Director  
ILO Subregional Office for East Asia  
(ILO/SRO-Bangkok)

Bangkok  
March 2004

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## **PREFACE**

**WISE (Work Improvement in Small Enterprises)** has been creating a large impact on the social and economic progress in the Philippines. Since 1994, the **WISE** project has been implemented in the four pilot regions, Davao, Cebu, Southern Luzon and Manila with the technical and financial assistance from the International Labour Organization (ILO) and United Nations Development Programme (UNDP) and produced the positive and practical results in the joint improvement of productivity and working conditions. The success of the **WISE** project proved the relevance of its approaches in the Philippine society. It is of particular importance that **WISE** demonstrated the fact of filling the gap between the large and small enterprises and opened up a new paradigm of the socio-economic development and the extension of the basic protection to a large number of workers in the Philippines. In the light of its achievement, the **WISE** project team received the DOLE KAPWA AWARDS (KAPWA stands for the good service for the people) in 1996. Consistently high and increasing priority will be placed on the WISE project in the Philippines. In 1997, **WISE** has been institutionalized and operated in the whole Philippine provinces. In the framework of its Social Reform Agenda, **WISE** is expected to play more fundamental roles in the socio-economic development of the country.

This training package is aimed at upgrading the skills of the **WISE** trainers who are responsible for conducting training courses and providing technical assistance for the local entrepreneurs and workers. The package is produced on the previous experiences of **WISE** trainers who have conducted hundreds of training courses in the Philippines. Showing the way of how to design and carry out the effective training courses on key technical topics such as materials storage and handling, work-station design, productive machine safety, control of hazardous substances, lighting, work-related welfare facilities, premises and work organization, emphasis has also been placed on the development of training skills for assisting the course participants in implementing and sustaining grass-roots level actions. By that, both entrepreneurs and their workers will be able to get an increasing benefit from the productivity gain and safety and health improvements.

This training package is a product of collaboration of many people. We are particularly grateful to the **WISE** trainers in the four pilot regions for their ideas and examples used in this package. We are also indebted to many entrepreneurs and workers who allowed us to implement checklist exercises and collect good local examples in their own workplaces. International experiences concerning the participatory training have always been our practical guide. Especially, the experiences of the activities of the International Labour Organization have been practically valuable for applying this action-oriented training package and using group work methods.

At the request of the International Labour Organization and the Department of Labor and Employment, the following people worked together for the development of this package: Kazutaka Kogi, Institute for Science of Labour, Kawasaki, Japan; Toru Itani, Nagoya City University, Nagoya, Japan; Tsuyoshi Kawakami, Institute for Science of Labour, Kawasaki, Japan; Jose Maria S. Batino, Labor Standards Research Division, Bureau of Working Conditions, Department of Labor and Employment; and William Salter, South-East Asia and the Pacific Multidisciplinary Advisory Team (SEAPAT),

ILO, Manila. Thanks are also due to Ms. Chita G. Cilindro-Director IV, Bureau of Working Conditions, Department of Labor and Employment; Mr. Cresenciano B. Trajano-Undersecretary, Department of Labor and Employment; Dr. Rashid Amjad-Former Director, Roger Bšhning-Director, SEAPAT, ILO Manila and Mr. Richard Szal-Director, ILO Office, Manila, for both material and intellectual support. The initiative of the ILO and the UNDP in realizing this project as part of its regular budget and program activities is also greatly appreciated. Thanks are particularly due to Ms. Fe Josefina D. Hammar, Chief of the Working Conditions and Welfare Branch of the Working Conditions and Environmental Department of the ILO and Ms. Sarah Timpson, Resident Representative of the UNDP for their continuing support.

We hope that this package will serve as an effective tool for supporting many local workplace improvements in the Philippines. Accelerating improvement experiences in the Philippines will also be a rich source for realizing productive and human-centered workplaces in many other countries.

Jose Maria S. Batino  
WISE Project Manager  
Bureau of Working Conditions  
Department of Labor and Employment  
The Philippines

William Salter  
South-East Asia and  
the Pacific Multidisciplinary Team  
ILO/SEAPAT, Manila

Manila  
March 1997

## MODULE 1: HOW TO USE THIS PACKAGE

This package is made in order to provide WISE trainers a complete set of guide materials, and help them arrange the training courses and manage the workplace changes in the enterprises. The package mostly explains the six basic training principles of WISE, which are to:

- Build on local practice;
- Focus on achievements;
- Link working conditions with other management goals;
- Use learning-by-doing;
- Encourage exchange of experience;
- Promote workers' involvement.

Ideas and suggestions used in this package are from the previous experiences of WISE activities in the Philippines, to which these six principles have been applied. **KEEP THESE SIX PRINCIPLES IN MIND AT ALL TIMES.**

This package contains detailed training guides and supporting materials. WISE trainers may follow the detailed procedures in the training steps with the assistance of the training materials.

The WISE methodology is unique because it relies on the initiative of the local people, entrepreneurs and workers. They are guided to look at good local examples, check available local solutions, plan and implement actions which will be useful for improving working conditions and productivity. This methodology makes clear that participating entrepreneurs are “the actors” and the trainers remain as “the facilitators”.

**Module Two, OUTLINE OF THE TRAINING STEPS**, gives an overview of the training course, from recruitment to follow-up. There are two important aspects in the WISE training: the technical aspect and the managerial aspect. Trainers should continue efforts in upgrading their technical background and course management skills.

**Module Three, TRAINING STEPS**, is the core of the package. This chapter shows detailed methods of how WISE trainers should conduct an effective training course.

### *Technical Advisory Tips:*

**Exercises** are introduced within technical section units to help trainers develop a lively training session. These activities appeal to the common sense of the participants which is the fundamental resource for realistic improvements in the workplace. WISE trainers are encouraged to develop further innovative technical exercises using common experiences of the local people.

**Potential questions and answers** aim to provide detailed and practical technical guidance for organizing a WISE course. This segment shows useful model answers based on experiences of local solutions applied in other areas.

WISE trainers are advised to develop their own answers to fit the particular situation and question raised during training. It will help expand this section by incorporating more examples.

***How To Be A Successful WISE Trainer:***

SUCCESS for a WISE trainer happens only when the participants are confident enough to continue their efforts in improving their workplaces at their own initiative.

**A Wise Trainer's Secrets To Success:**

- Know as many improvement examples as possible to help other people in implementing their work changes.
- Visit many local workplaces and develop a network for exchanging experiences in workplace improvements.
- Be curious of technical know-how applied to local improvements and add this information to the training material.
- Be a positive adviser who is sensitive to the feeling of participants regarding their workplace improvements.
- Keep alert for opportunities to increase technical know-how, develop useful training skills, create practical ways of organizing the training courses, and finding common factors in the compiled improvement examples.

**Module Four, OUTLINE OF WISE MATERIALS, AND THEIR POTENTIAL ROLES**, gives a listing and brief explanations of newly developed training and promotional products. Included are: Database management system; Booklet of low-cost improvement examples; WISE brochure, leaflets and topic flyers; Success stories; Industry-specific Action Manuals and Productivity Performance Assessment System for garment manufacturing, food processing, metalworking and woodworking industries; Photo sheets and posters; WISE checklist and forms; New training module on environmental protection and; WISE promotional videos for entrepreneurs and workers. These materials have been developed to provide support for organizing effective WISE training courses. Feedback from training experiences are expected to upgrade the quality of these materials.

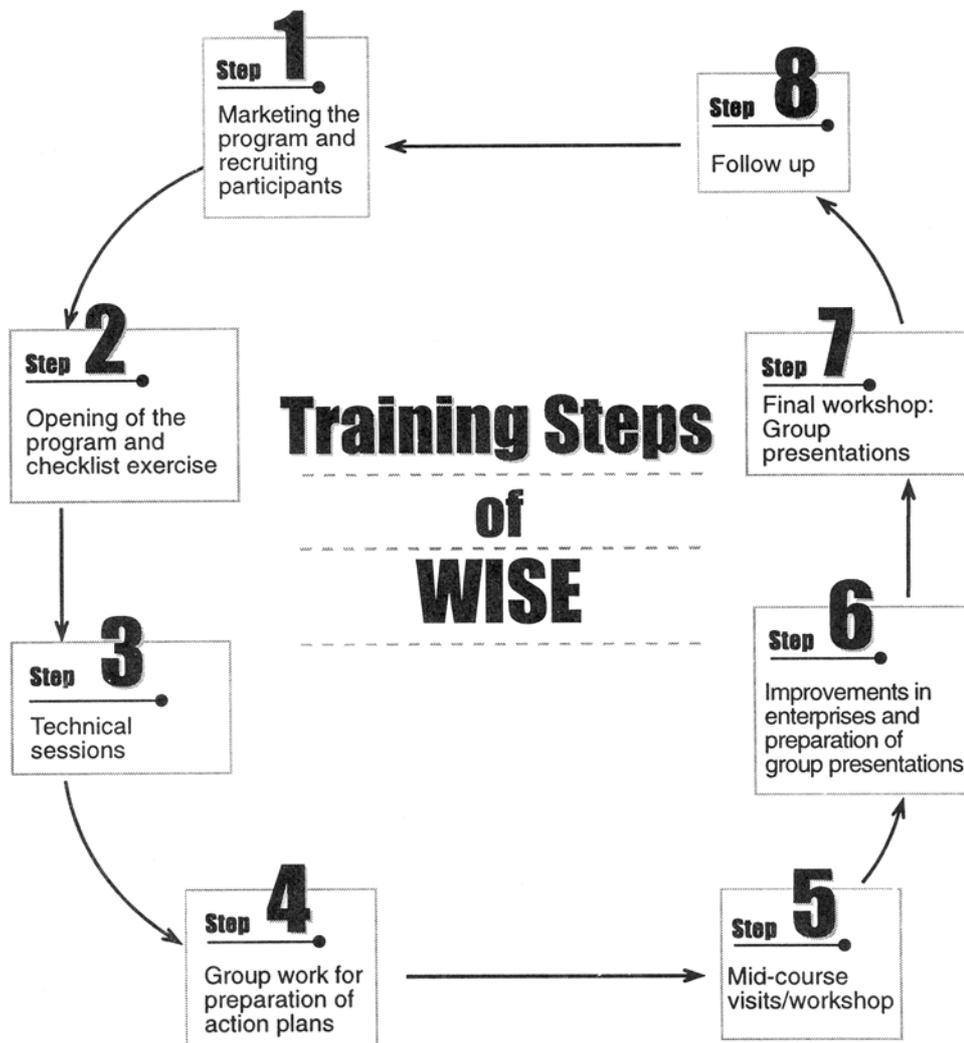
**Module Five, TRAINING MATERIALS**, like the action checklist, transparencies showing basic WISE technical rules. WISE trainers must understand the detailed guide shown in the training steps and in using supporting materials to successfully carry out the training course. WISE trainers should concentrate their effort in upgrading the course quality and enhancing local improvement initiatives.

## MODULE 2: OUTLINE OF THE TRAINING STEPS

A comprehensive WISE course is made up of a preliminary step and eight training steps. Together they represent the participatory and positive nature of the WISE approach.

### PRELIMINARY STEP

Discussions among regional WISE trainers are important when planning effective course organizations and annual schedules. WISE trainers should consider the characteristics of their region when identifying their targets. What kind of management and labor groups have the high priority? How accessible are they? How can the training courses be effectively distributed for mobilizing local human resources? It is advisable to inform the locals of the annual schedule of the WISE courses after the plan has been established.



## **DESIGNING WISE TRAINING STEPS FOR A COMPREHENSIVE COURSE**

### **STEP 1: Marketing the program and recruiting participants**

WISE trainers should:

- a Obtain information regarding the industrial characteristics of local regions where they plan to organize the next course.
- b Contact key industrial or commercial associations to effectively market the WISE course contents.
- c Prepare an attractive brochure featuring the outline of the program. Newly developed promotional materials (i.e. introductory videos or the good example booklet) can also help.
- d Carry out a one-day awareness course for entrepreneurs and workers prior to the actual training.
- e Conduct a series of enterprise visits based on preliminary list of potential participants.
- f Collect good examples by taking pictures.

**REMEMBER: EACH WISE TRAINER SHOULD ACT AS A POSITIVE PARTNER IN THE SOCIO-ECONOMIC DEVELOPMENT OF THE LOCAL COMMUNITY DURING RECRUITMENT.**

### **STEP 2: Opening of the program and checklist exercise**

During the opening session, several guest speakers, arranged by WISE trainers and local organizations, will provide encouraging remarks. This will be followed by a brief orientation of the course and the checklist exercise in real workplaces. **IMPORTANT:** Stress the action-oriented nature of the course; select an appropriate enterprise to be visited for the purpose of the checklist exercise.

### **STEP 3: Technical sessions**

As the core of the training, eight technical areas of WISE will be covered:

1. Materials storage and handling
2. Work-station design
3. Productive machine safety
4. Control of hazardous substances
5. Lighting
6. Welfare facilities
7. Premises
8. Work organization

The materials storage and handling session helps avoid bottlenecks and delay, ensuring the smoothness of the workflow. The workstation design session demonstrates the advantages of improved work postures and ergonomic workstations that enhance productivity and reduce fatigue. The productive machine safety session will teach the participants techniques that increase productivity and eliminate work hazards in modern machine guards and feeding devices. Simple and inexpensive means of controlling hazardous substances in most small enterprises will be tackled in the control of hazardous

substances session. Reduced electricity bills and improved lighting conditions created by skylight and regular window maintenance will be the main thrust of the lighting session. The welfare facilities and services session will highlight the positive effects basic welfare facilities have on the worker's morale, motivation, health, job satisfaction and attendance.

Simple improvement measures on the ceilings, walls and floors, on the ventilation, heat and pollution will be discussed in the work premises session. Modern work organization techniques like recombining tasks, setting up buffer stocks, multi-skilling, developing group work-stations and using product-based organizations provide better work flow and higher product quality as seen in the work organization session.

#### **STEP 4: Group work for the preparation of action plans**

In this step, participants develop their own ideas on workplace improvements. These plans are created out of their own initiative and they will grow during the group's interactive discussions.

**REMEMBER: WISE TRAINERS SHOULD MAINTAIN THEIR RESPONSIBILITY AS FACILITATORS IN ACTIVE GROUP DISCUSSIONS AND ACTION PLANNING.**

#### **STEP 5: Mid-course visits/workshop**

In this section, participants will discuss achievements and constraints with their groupmates and trainers in a relaxed atmosphere or setting. Practical hints for overcoming their specific improvement bottlenecks can be picked up from local wisdom and success examples. WISE trainers should look into the organizational aspects of these improvements such as mobilization of local resources and possible involvement of supervisors and workers.

#### **STEP 6: Improvements in enterprises and preparation of group presentations**

Motivated participants will be applying improvements in their workplaces and entries to the Simple, Inexpensive and Clever (SIC) contest can be chosen by participants and trainers from these efforts. Action plans that might not be applied during the course sessions, but a few months after, should also be encouraged. WISE trainers will assist participants in preparing presentations that detail their action plans and achievements. Visual presentations involving slides or photographs and transparencies will be commended, particularly when it involves before and after the improvement workplace situations. Not only will they be convincing material of the course's results, they can also be added to the training materials of future courses.

#### **STEP 7: Final workshop - Group presentations**

This is the course highlight for the participants as distinguished guest speakers give congratulatory addresses. The main part of this workshop is the final presentations of the participants' achievements and future plans followed by brief discussions. At this point, the SIC winners are announced and the course is formally closed.

**STEP 8: Follow up**

The participants' enterprises are supported in their improvement plans and their progress is continuously monitored and evaluated. Well-coordinated follow-up activities often help local people in creating an information network to sustain their improvement activities.

## MODULE 3: TRAINING STEPS

### PRELIMINARY STEP

#### Activity 1 – Designing the effective training steps

Objectives	Developing the WISE training courses which respond to the particular needs of the local people.
Duration	1 - 3 days
Outputs	A set of the training materials and methods meeting the region's local needs
Methods	Reviewing the training materials. Brainstorming among the regional WISE trainers.
Training Tools	Training manual

An overview of the assigned region's specific needs is essential in defining the course's goals. WISE trainers should brainstorm regarding the particular needs of the region while slides as well as good examples which represent the local area should be compiled.

#### Activity 2 – Developing an annual plan of the training courses

Objectives	Allocating the dates and places of the training courses in the most effective way
Duration	1 - 3 days
Outputs	Overview table of the training schedule in the region
Methods	Brainstorming and interactive discussion among the WISE trainers.
Training Tools	Local map, work schedule of the regional labor office.

Develop an overview of the region's training schedule and inform the local participants ahead of time. Select appropriate dates and venues in the region for the training courses. WISE trainers should link improvement experiences and achievements among the different parts of the cities in the region. An established network for exchanging success stories in the region can accelerate progress for participants.

## DESIGNING WISE TRAINING STEPS FOR A COMPREHENSIVE COURSE

### STEP 1: Marketing the Program and Recruiting Participants

Although introductory videos and flyers are present, WISE trainers are encouraged to answer questions from potential participants in their own words.

#### Activity 1 – Selecting a group of enterprise with potential interest

Objectives	Locating a group of manufacturing enterprises with potential interest in improving productivity and working conditions
Duration	1 - 3 days
Outputs	A list of enterprises with potential interest
Methods	Collect a list of enterprises in the region. Local industry associations or chambers of commerce may assist you to fulfill this purpose.
Training Tools	Training manual

A good way to get started in this process is to find out which enterprises in the region have high needs and interests in improving their productivity and working conditions. This can be done by brainstorming with other WISE trainers and labor inspectors. Brainstorming is also useful for developing a list of associations or key persons in the region who may help pinpoint potential participants.

Important things to consider in producing active discussions among participants:

- they are more or less in the similar business environment;
- they are more or less the same size;
- they are not in direct competition (though participant groups from the same industries are desirable); and
- they are located within easy traveling distance of each other.

Things to identify and consider when organizing an industry-specific course:

- main industries which play an important role in the region's economy;
- key associations and persons who should be invited as participants;
- the industry-specific courses' practical benefits to the participants;
- possible improvement points by the local entrepreneurs; and
- multiple impacts on the region's economy.

## Activity 2 - First contact

Objectives	Informing entrepreneurs of WISE training courses and their benefits.
Duration	1 - 3 days
Outputs	A list of enterprises to be visited
Methods	Telephone calls / Mailing letters
Training Tools	Training manual

The first contact is very important as this is when owners/managers form their impressions of WISE. WISE trainers should be clear and positive when explaining their purpose without being too detailed, and should instead set an appointment to return as soon as possible. A realistic schedule of when to visit all the contacted enterprises should be made in the first contact phase.

The main activities included in this phase are:

- to telephone or send an invitation with WISE brochures to potential participants;
- to give them a brief introduction of the WISE training courses;
- to make appointments with the potential participants; and
- to establish an effective schedule for visiting all the enterprises which have the potential to participate in WISE courses.

## Activity 3 - Marketing the program

Objectives	Explaining the benefits of WISE training courses and confirming the participants.
Duration	5 - 10 days
Outputs	A tentative list of around thirty participating enterprises
Methods	Presentation, Interactive discussion, Joint walk-through in workplaces
Training Tools	Training manual

This step is the most important for recruiting and confirming participants. Use positive advisory skills from previous WISE experiences to convince the entrepreneurs to attend the courses. While it is important to present the contents and positive achievements of the WISE program clearly, visits with potential participants must always be kept short. Avoid giving any negative impressions, as well as notions of “inspecting” or “auditing” the company in an authoritative fashion.

Ask permission from owners/managers to take pictures of their workplaces, assuring them that these photographs won't be used to investigate or punish them. Photograph the good points of the workplace and praise them for their efforts, then photograph potential improvement points. Photographs of the good points will later prove useful as practical training materials, while photos of those with improvement potential will be used to compare to the actual improvements during and after the WISE training.

Arrange to have a preliminary walk-through with the owners/managers of the enterprises. This walk-through is important in convincing them of the benefits of WISE. Prepare carefully for this first visit. Communicate positively and be sure to mention the previous achievements in other workplaces.

Increased practical knowledge of the technical contents of WISE is important in identifying points for improvement. Exchange success stories with other WISE trainers on how owners/managers were convinced to participate in WISE training courses. Constantly assess your way of speaking and knowledge of the technical aspects so as to build effective skills for recruiting participants.

If you intend to hold an industry-specific WISE seminar, research on the recent business and market conditions of the particular industry. Relate the improvement of working conditions in the enterprises to the upgrading of their business. Speak in the entrepreneurs' language as this will add to your credibility.

The main activities in this step include:

- visiting all the listed enterprises;
- introduction of the WISE program and stressing its benefits;
- encouraging interest in the program and overcoming any initial suspicions by showing various promotional materials;
- conducting preliminary walk-through in their workplaces;
- identifying good examples and taking photographs;
- identifying potential points to be improved during the WISE course;
- discussing positive impacts on their business;
- confirming their participation; and
- immediately sending them a final program of the WISE seminar.

## **STEP 2: Opening the Program and Checklist Exercise**

Welcome all the recruited participants at the venue with crisp opening and orientation sessions immediately followed by a checklist exercise. This will impress participants of the positive, participatory nature of the WISE training courses.

### Activities 1 & 2 - Opening Session / Orientation

Objectives	Welcoming the participants, and giving them an outline of the course program.
Duration	20 -30 minutes
Outputs	A tentative list of around thirty participating enterprises
Methods	Presentation
Training Tools	Brief speeches / Transparencies

Arrange guest speakers as well as representatives of regional labor offices and WISE trainers, to give a short speech on the importance of the course and the need to apply the new WISE approach for the opening session. The practical value of the course and its easy-to-apply, low-cost improvements will be stressed in the orientation session. In the end, participants will be able to:

- understand the need for owners/managers of small enterprises to get training on improved working conditions and productivity;
- appreciate the practicality of the low-cost, productivity-enhancing improvements applied to their workplaces; and
- open up communications between participating owners and managers.

### Activity 3 - Checklist exercise

Objectives	Learning how to apply an action checklist for the purpose of selecting priority improvements in small enterprises in the local situation.
Duration	80-90 minutes
Outputs	Participants who understand the practical value of the action checklist and the small group discussion methods.
Methods	Presentation / Factory visit combined with the application of a checklist. Group work
Training Tools	Checklist / Walk-through

Immediately after completing the company visits, initiate checklist exercise and initial workshop. Organize these at a location convenient to the participant companies. The checklist exercise is slated as the first training activity for several reasons:

- to convince participants of the benefits of the course;
- to emphasize the practical, action-oriented activities of the course;

- to show the trainers' respect for the participants' knowledge and experience;
- to assemble a pool of examples which will be discussed in the following activities;
- to introduce the main subjects covered by the course;
- to initiate group work and participants' involvement; and
- to promote the use of a practical tool through many applications.

The checklist is designed to be more action-oriented rather than problems or subject-related so that specialized knowledge is not required in order to answer it. Essentially a part of the Action Manual, it is the only part that will be distributed to the participants at this point.

Careful arrangements are to be made for the factory visit in order to conduct an effective Checklist Exercise:

- find a factory located within thirty minutes from the seminar site;
- arrange a bus or jeepney for shuttling participants to and from the factory; and
- select a factory which covers the eight WISE technical areas (refer to Step 3 of the Training Steps).

## NOTES FOR TRAINERS

### Practical Hints for Conducting the Checklist Exercise

Structure	After a brief introduction and interview of the factory manager, participants are given an action checklist where they mark appropriate responses while observing the workplace. Questions on how to apply the checklist are very relevant. Then they are divided into groups to discuss results and present their views on good points and priority actions.
Initiative	Participants are encouraged to take initiative and identify applicable solutions. DO NOT give detailed explanations or guide participants regarding which technical solutions should be given priority. Trainers should allow the participants to form their own judgments.
Facilitation	The checklist exercise also offers trainers an opportunity to apply their roles as facilitators, which are to: <ul style="list-style-type: none"> <li>- facilitate discussion and sharing of experiences;</li> <li>- apply participants' own knowledge and skills, rather than teach advanced technical know how;</li> <li>- focus on solutions that are locally available, low-cost and immediately implementable; and</li> <li>- support the problems and solutions identified through the initiative of participants.</li> </ul>

### **STEP 3: Technical Sessions**

This section is the technical core of the WISE training courses and it covers the following areas:

- 1 Materials storage and handling
- 2 Work-station design
- 3 Productive machine safety
- 4 Control of hazardous substances
- 5 Lighting
- 6 Work-related welfare facilities
- 7 Premises
- 8 Work organization

While these topics form the basis of the course, other relevant topics may be added in future course programs.

#### ***NOTES FOR TRAINER***

##### **Practical Hints on How to Conduct Technical Sessions**

###### **1. The importance of covering eight technical areas.**

The aforementioned eight technical areas are discussed in the technical sessions in detail by the trainers and participants because they give a good overview of technical improvements that are readily available to most small enterprises. Even the order in which they are discussed has proven to be the most effective sequence of topics for WISE training courses.

###### **2. Why emphasis is put on the technical sessions.**

There are three strong reasons why traditional lectures are not used in the technical sessions:

- a) WISE training courses are geared towards increasing the participants' awareness and motivating them to start practical improvements instead of just adding to their knowledge.
- b) Our participants are mature, self-confident entrepreneurs who value their time and do not like to be lectured.
- c) The technical sessions must lead towards active work groups that encourage an exchange of workplace experiences and joint implementation of improvement ideas.

Trainers should examine their training techniques, focusing on:

- being more concerned with action rather than technical content;
- emphasizing practical ideas rather than general theory;
- generating discussions and an exchange of ideas rather than “teaching”;

- building on participants' strengths and achievements rather than problems and weaknesses; and
- being a consultant and facilitator rather than a "teacher".

### **3. The Use of Visual Aids.**

(i.e. slides, overhead projector transparencies, writing board & flip-chart)

Slides taken from the participants' workplaces and similar situations must be used to show good local examples. Focus on positive examples achieved at a low cost of improvement. Avoid situations that are unfamiliar or foreign to your participants. Encourage participants to elaborate on the details when showing their workplaces.

An overhead projector is an ideal training tool because it conveys the message clearly, even when the lights are on especially when using pre-prepared transparencies. Use a maximum of 7-8 lines per transparency for easier reading. Keep blank transparencies and special dark colored felt pens handy for group presentations.

A black or white board and flip-charts should be used during brainstorming sessions and group exercises. Points mentioned earlier can be returned to on a flip-chart and relevant sheets can be detached and tacked to the wall for easy reference.

### **4. The Training Room.**

**MAKE SURE** each group of participants is clustered around a small table.

**NEVER** use the traditional arrangement of seats in rows.

**FACE TO FACE DISCUSSION** is a must between participants.

**MAKE SURE ALL CAN SEE** the projector's screen, boards or flip-charts.

**DO NOT USE** a large desk or lectern since it is inappropriate for participatory sessions.

**MAKE EVERYTHING NEAT & COMFORTABLE** to make your participants relax and feel at ease.

### **5. Organizing the Training Session.**

Technical sessions should not exceed 45 minutes to keep the participants interested. Any longer and the trainer runs the risk of boring the participants. Welcome questions, comments, and interventions to keep the session interactive. This provides constant feedback from the participants and a higher level of interest is maintained.

## ***UNIT 1. MATERIALS STORAGE AND HANDLING***

Objectives	<ul style="list-style-type: none"> <li>- Identify and focus on commonly encountered working conditions problems in materials storage and handling at the workplace.</li> <li>- Link better materials storage and handling to productivity enhancement and better product quality.</li> <li>- Point out usually available simple and low-cost improvements in materials storage and handling.</li> <li>- Describe some useful examples of improved materials storage and handling in the Philippine context.</li> </ul>
Duration	35 - 45 minutes
Outputs	Participants trained in basic principles of materials storage and handling
Methods	Presentation / Group discussion
Training Tools	Checklist, slides and transparencies showing good local examples

### **Suggested Training Plan**

#### **Introduction**

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
1. Welcome participants (and introduce yourself if this is the first time for you to make a presentation).	Presentation		2–3 min.
2. Give the title of the unit session. Stress that materials handling is important in almost all enterprises and that well-organized materials storage and handling is a first condition of productive work. Conduct a small exercise to	Exercise	Transparencies (perhaps posters for your slogans written in large size),	5 min. (for 2 and 3)

Key activities	Method	Media	Time
demonstrate that an item moved from one place to another does not add value. Show some striking slogans such as “Materials handling does not add value, just cost”, “30% of accidents are caused by materials handling”. Then ask participants what benefits they think can be derived from good materials handling. Write down the points mentioned and make a brief summary saying that good materials handling can increase productivity and prevent damage and fatigue.		Demonstration exercise (moving an item with no value added)	
3. Present a list of ideas which will be discussed by showing them in a transparency. These ideas should include: <ul style="list-style-type: none"> <li>- how to reclaim work space and reduce stock;</li> <li>- how to prevent time loss for locating tools or material</li> <li>- how to improve materials flow and reduce handling; how to eliminate manual lifting operations.</li> </ul> Then indicate the exact time when the session will end. Invite the participants to contribute to the discussion.	Presentation and discussion	Transparencies	

### Rules on better-organized storage

Key activities	Method	Media	Time
4. Show slides of a few practical improvements related to multi-level storage, done together with the idea to avoid placing materials on the floor. Also show slides of conveniently placed racks, containers and inserts for keeping tools and work items in good order. Ask participants what good points they can identify from the slides.	Presentation and discussion	Slides (you may add transparencies showing good arrangements in the “Action Manual”)	5-7 min. (for 4 and 5)

Key activities	Method	Media	Time
<p>5. Draw out the following rules from this discussion:</p> <ul style="list-style-type: none"> <li>- If in doubt, take it out; discussion</li> <li>- Avoid placing materials on the floor;</li> <li>- Save space by introducing multi-level shelves and racks;</li> <li>- Provide a “home” for each tool and work item;</li> <li>- The more you use it, the closer it should be.</li> </ul>	Presentation and discussion	Transparencies	

### Rules on fewer and shorter transport and handling work

Key activities	Method	Media	Time
<p>6. Show slides of pushcarts, hand-trucks, movable storage racks, tool trolleys, mobile work-stations, rollers as well as pallets or containers used with them. Also show slides of intermediate work-stations, supporting tables, assembly stands and conveyor lines for moving heavy work items at working height. Ask participants what good points are found in these slides.</p>	Presentation and discussion	Slides (you may add transparencies showing good arrangements in the “Action Manual”)	5-7 min. (for 6 and 7)
<p>7. Present the following rules:</p> <ul style="list-style-type: none"> <li>- Use mobile storage;</li> <li>- Use push-carts, hand-trucks and trolleys;</li> <li>- Use easy-to-carry pallets and containers;</li> <li>- Don’t lift loads higher than necessary;</li> <li>- Move materials at working height.</li> </ul> <p>Explain advantages and benefits of mobile storage and using wheels and invite comments from participants.</p>	Presentation and discussion	Transparencies	

### Rules on more efficient lifting

Key activities	Method	Media	Time
8. Show slides of simple, easy-to-transport lifting devices, including hoists, manually powered hydraulic cranes, lift tables, lift trucks or movable conveyors for lifting heavy loads. Invite comments from the participants.	Presentation and discussion	Slides (you may add transparencies showing good arrangements in the “Action Manual”)	5-7 min. (for 8 and 9)
9. Present the following rules: <ul style="list-style-type: none"> <li>- Make lifting more efficient and safer;</li> <li>- To manually raise a heavy load, keep the back straight and use the muscle power of the legs and get help from your co-workers when needed.</li> </ul> Explain types of lifting devices which are simple, ready-to-use in varying lifting situations. Stress that wheels can be attached to these lifting devices, that very heavy loads should be moved at a minimum elevation, and that two or more people should work together for handling very heavy loads manually.	Presentation and discussion	Transparencies	

### Mini-case study exercise

Key activities	Method	Media	Time
10. Put on the ground a pile of vegetable items and ask participants what good ways they can suggest for transporting these items onto a table placed at the other end of the room. List the ideas put forward on a board, flip-chart or transparency. Make a brief summary of the points put forward and relate them to the rules explained.	Exercise (depending on the time available, you may choose a different exercise; e.g., by asking a question about advantages of a mobile rack)	Flipchart, board or transparency	

## Conclusion

Key activities	Method	Media	Time
11. Summarize using a transparency of all the storage and handling rules. Point out that all relate to better productivity. Mention that all are covered in the “Action Manual”. If time permits, illustrate each rule with 2-3 slides. Invite questions and comments (comments about the relation to productivity are most relevant).	Presentation	Transparency	3-5 min.

## NOTES FOR TRAINERS

### 1. Session design

**Background** This is the first of the technical sessions because it:

- is applicable to almost all enterprises;
- is concrete, practical and easy to understand;
- is easily illustrated with slides from the participants’ enterprises; and
- attracts the immediate interest of participants by pointing out clear connections to both present working conditions and productivity.

**REMEMBER:** The session should focus on ideas you have collected during the factory visits of participating enterprises. Group the ideas you formed around rules described in the Action Manual. Popularize for the group the ideas found at some enterprises. **DO NOT** give a lecture about the theory of materials handling.

**Sub-units** The session is divided into four sub-units:

<i>Sub-unit</i>	<i>Purpose</i>	<i>Time available</i>
Introduction	To arouse interest	7-8 min.
Presentation of rules and examples	To communicate ideas and motivate implementation	18-20 min.
Mini-case study exercise	To reinforce ideas and sharpen do-it-yourself skills	15 min.
Conclusion	To provide a summary and overview	3-5 min.

**Time limit** Respect the time limit of 45 minutes. It is really essential to have a rehearsal of your session. The presentation should be rehearsed early and improved by getting feedback from all trainers.

## 2. Exercises

### **Key activity 2 Demonstration exercise**

This exercise is conducted as a small exercise in an improvised manner. Prepare a small amount of onions or oranges, possibly placed in a small bamboo basket, and put them on one of the tables of participants. Ask a participant sitting nearby to move the basket to the next participant, and ask this next participant to pass it on to the next, and then to the next. Then ask the participant who finally received the basket if the value of the onions (or oranges) in the basket has changed. The answer is obviously “no”. The exercise finishes with this answer. You just go on to show the slogan: “Materials handling does not add value just cost”.

### **Key activity 10 Mini-case study exercise**

Put on a large sheet of paper placed on the ground, a pile of vegetable items (or fruit items). Then make sure there is a small table at the other end (or corner) of the room. Ask participants what good ways they can suggest for transporting these items onto the table at the other end (corner) of the room. List the ideas put forward on a blackboard (whiteboard), flipchart or transparency. The participants may first mention the use of a pushcart or a basket. Some may say the vegetables should have been placed on a table of nearly the same height so that moving them from the table to the pushcart should be easier. Some others may suggest the use of small containers combined with the use of a cart. A lift truck might be mentioned. Perhaps there may be a suggestion that the vegetables should have been delivered already in small containers or already on a mobile rack. Let the participants put forward whatever ideas they may think useful. Try to have a short discussion on what might be the best way (possibly the delivery at the outset of the vegetables in small containers placed on a push-cart so that all that is needed is to move the cart to the table at the other end and transfer the vegetable containers onto the table of nearly the same height). Also, try to invite comments about whether the approach might differ if the circumstances differ - e.g., heavier load, longer distances, uneven floor, etc. The message of this discussion should be that there are some basic principles that can be applied to different situations.

Make a brief summary of the points raised and relate them to the materials handling rules explained.

Depending on the time available, you may choose a different way to run this exercise (for example, by asking a question about advantages of a mobile rack).

### **3. Potential questions and answers**

The following are potential questions that may be asked by participants in the course of running this session and sample answers by the trainers. There may be other questions, but most of them are relatively easy to answer by studying carefully the “Action Manual”.

**Question 1** **The introduction of mobile racks may create problems in using them on an uneven floor. How can we use mobile racks in such a situation?**

**Answer 1** Make the floor as even as possible by removing materials from the floor, filling holes and eliminating stumbling hazards. Where height differences are unavoidable, use ramps with an inclination of up to 5-8 degrees. If the floor remains uneven for various reasons, use larger wheels as they are more adapted for moving around on an uneven floor.

**Question 2** **Multi-level racks mean considerable height differences of shelves. How can we effectively use such shelves of different height levels?**

**Answer 2** Shelves of convenient height should be used for materials that are utilized frequently. Put heavy and less frequently used materials on the lower parts of racks, and light and occasionally used things on the higher parts of racks.

**Question 3** **Returning each time tools, raw materials and semi-products to their designated “homes” takes much time. Is it really productive?**

**Answer 3** The time consumed for bringing back things to a home is much shorter than the time needed in searching for these things from messy worktables or storage. The location of “homes” should be near the place where the particular tools, materials or work items are being used, so that time for returning them is minimal.

## UNIT 2. WORK-STATION DESIGN

Objectives	<ul style="list-style-type: none"> <li>- Identify key ideas for better workstation design including proper position of materials, tools and controls, better working postures and the use of time and effort-saving arrangements.</li> <li>- Link better workstation design to productivity enhancement and better product quality.</li> <li>- Point out usually available simple and low-cost improvements in workstation design.</li> <li>- Describe some useful examples of improved workstation design in the Philippine context.</li> </ul>
Duration	35 - 45 minutes
Outputs	Participants trained in basic principles of work-station design
Methods	Presentation / Group discussion
Training Tools	Checklist, slides and transparencies showing good local examples

### Definition of “Work-Station”

A **workstation** is the place which a worker occupies when performing a job. It can either be occupied all the time or it could be one of many places where work is done. A work stand or worktable for machine operation, tool operation, assembly, or inspection are ideal examples of a work-station. In workstation design, the worker and the task are taken into consideration to ensure a smooth work flow and increased productivity.

### Suggested training plan

#### Introduction

Key activities	Method	Media	Time
1. Give the title of the unit session. Explain what is meant by a “work-station”. Mention that having discussed materials handling, it is now time to have a close look at workstations in order to improve comfort and work efficiency. Stress that a well-designed workstation is needed for productive work.	Presentation	Transparency	2-3 min.

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
<p>2. Indicate the exact time when the session will end. Ask participants what kind of workstations are used in their workplaces and if they knew of any improvements done. Invite participants to comment on such examples. Present a list of ideas which will be discussed in transparencies or possibly on poster. To make them more appealing, you can use the “how to” format, such as:</p> <ul style="list-style-type: none"> <li>- how to increase productivity by changing the position of tools and materials;</li> <li>- how to redesign a work height and a chair to increase product quality;</li> <li>- how to avoid wasted effort using simple fixing devices;</li> </ul> <p>how to locate dials and controls to minimize mistakes.</p>	Presentation and discussion	Transparencies(perhaps poster for your how-to ideas written in large size)	4 min.

### **Rules on easy reach**

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
<p>3. Show slides of several workplaces materials, tools and controls within and easy reach of workers and at discussion appropriate height. They should include good use of bins and tool holders. Ask participants what good points they can identify from the slides. Show a transparency on appropriate reach distance for sitting and standing workers.</p>	Presentation and discussion	Slides (you may add transparencies showing good arrangements in the “Action Manual”) Transparency	5-7 min. (for 3 and 4)

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
<p>4. Present the rule below referring to Presentation Transparency the good examples and the discussion and explain the advantages and discussion benefits:</p> <ul style="list-style-type: none"> <li>- Keep materials, tools and controls within easy reach.</li> </ul> <p>Invite comments from participants.</p>	Presentation and discussion	Transparency	

### Seat-back exercise

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
<p>5. Start this exercise. Ask participants to sit so that they cannot use their backrest or lean on the table or armrests. For this exercise, they should move to the front of their chair and sit halfway. Ask them to make sure that their neighbors are not leaning on the table or backrest or otherwise “cheating”. Mentioned that the seat-back exercise is continued during the presentation of the next rule.</p>	Exercise		1-2 min.

### Rules on work posture

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
<p>6. Show slides of ergonomically sound standing and sitting work height where the hands are around the elbow discussion height (meaning “elbow rule” is observed). Ask participants what good points are found in these slides and what benefits are gained by keeping hands at the elbow height. Then show one or two slides of workers in difficult work positions</p>	Presentation and discussion	Slides (you may add transparencies showing good arrangements in the “Action Manual”	5-7 min. (for 6 and 7)

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
(operations with hands raised above shoulder level, or in bending postures or in chairs without backrest) and ask where the workers feel fatigue and pain.			
<p>7. Present the following rules:</p> <ul style="list-style-type: none"> <li>- Change work surface height or position of work items, tools or controls so that work is done at elbow height;</li> <li>- Use platforms so that short workers can be at the proper work height;</li> <li>- Provide good chairs of correct seat height and with a good backrest;</li> <li>- Provide enough leg space to allow easy leg movement.</li> </ul> <p>Explain recommended dimensions for seated tasks and for standing work using transparencies showing such dimensions in the “Action Manual”. Invite comments from the participants.</p>	Presentation and discussion	Transparencies	

### **Completing the seat-back exercise**

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
8. Release the participants from not using their seat backs. Ask how their backs feel. Everyone would agree that they felt strains on their backs in just a few minutes of exercise. Emphasize that the strains would be much more for someone who works in an awkward position and performs tasks repeatedly and for a long time. Stress that in addition to correct work height, chairs with a good back and cushion help keep productive work.	Exercise		2-3 min.

### Rules on use of fixtures

Key activities	Method	Media	Time
9. Show slides of workstations using jigs, clamps, suspended tools, levers, chutes, counterbalances and other devices for saving worker's energy and time for productive work. Ask participants what benefits are brought in by using these arrangements.	Presentation and discussion	Slides (you may add transparencies showing good arrangements in the "Action Manual")	5-6 min. (for 9 and 10)
10. Present the rule: - Use clamps, jigs, levers and other devices to save time and effort. Stress that simple workstation arrangements to hold work items are important to prevent wasted effort and improve work. Explain that the work can be done skillfully and efficiently when the hands are free for productive work.	Presentation and discussion	Transparency	

### Rules on displays and controls

Key activities	Method	Media	Time
11. Present slides showing properly labeled or color-coded display, emergency switches made distinctly outstanding and clear layout of dials and switches. Explain that an important general rule for display and controls is: - Improve display and controls to minimize mistakes. A transparency showing an easy-to-see layout of dials and switches can be used.	Presentation and discussion	Slides and transparencies	5-6 min. (for 11 and 12)

Key activities	Method	Media	Time
<p>12. Present the following rules:</p> <ul style="list-style-type: none"> <li>- Make mutually related dials and controls grouped together;</li> <li>- Make clearly identifiable which control corresponds to which;</li> <li>- Use different shapes or colors for different kinds of switches or signals;</li> <li>- Label dials and switches clearly as to what operation is meant;</li> <li>- Make the emergency switch easily visible.</li> </ul> <p>Emphasize that easily is disguisable display and controls can minimize mistakes.</p>	<p>Presentation and discussion</p>	<p>Slides and transparencies</p>	

### Curve-tracking exercise

Key activities	Method	Media	Time
<p>13. Distribute to each participant two copies of the curve-tracking exercise form. Ask them to place a copy in front of them at the far right and about 30 cm. below the edge of the table. Explain that they are to track the curves on the form using a pencil, starting from the left end of each curve and moving to the next curve when reaching the right end. Do this curve tracking for 30 sec., and ask them to count the number of curves tracked the pencil crossed the limit lines. Then ask them to place the other form just in front of them and do the same tracking for 30 sec. Let them count the number of curves tracked and compare the results with the previous results. The participants would confirm that the number of curves tracked increased in the second trial.</p> <p>Stress that it is important to do the work within easy reach and in a comfortable posture.</p>	<p>Exercise (depending on the time available, you may choose a different exercise; e.g., by asking a question about advantages of an appropriate work height)</p>	<p>Curve - tracking exercise forms</p>	<p>10 min.</p>

## Conclusion

Key activities	Method	Media	Time
14. Summarize using a transparency of all the workstation rules. Emphasize that all relate to better productivity. Mention that all are covered in the “Action Manual”. Illustrate each rule with two slides. Invite questions and comments (comments about the relation to productivity are most relevant).	Presentation	Transparency	3 min.

### *NOTES FOR TRAINERS*

#### **1. Session design**

**Background** This session may be approached in much the same way as the session on materials storage and handling. One essential difference between the two subjects is the relative weight of productivity versus working conditions benefits. In the case of better storage and handling, its benefits for productivity, cost, space and stock control are obvious while the benefits in terms of working conditions (such as the probability of fewer accidents and less tiring work) are sometimes more difficult to see. With better workstation design, it is easy to see the benefits for the worker (more comfortable work and less fatigue), whereas the relation to productivity is not always readily visible. Many entrepreneurs believe that a more comfortable worker will tend to relax and work more slowly. It is thus important to present the workstation rules to demonstrate the benefits to both productivity and work comfort.

It is useful to point out that well-designed work-stations are less tiring and can prevent work-related safety and health risks. Good work postures and less tiring operations can reduce the risk of low back pain and neck, shoulder and arm disorders. More and more managers and workers worry about such disorders because they result to absenteeism. These people may well understand the benefits of a better workstation design.

The four rules of this technical session have been chosen to focus on the relation between comfort and work efficiency. While it is possible to concentrate on one or two main rules during this session, at least five minutes should be spent on each of the four rules.

**Sub-units** The session is divided into four sub-units:

<i>Sub-unit</i>	<i>Purpose</i>	<i>Time available</i>
Introduction	To arouse interest	6-7 min.
Presentation of rules and examples	To communicate ideas and motivate implementation	25-30 min. including the seat-back exercise
Curve-tracking exercise	To improve awareness of proper work-station	10 min.
Conclusion	To provide a summary and overview	3-5 min.

**Time limit** Respect the time limit of 45 minutes. It is essential to have a rehearsal of your session.

**2. Exercises**

**Key activity 5 Seat-back exercise**

This exercise is conducted while the presentation of rules and examples is done. Ask participants to sit so that they cannot use their backrest or lean on the table or armrests. For this, they should move to the front of their chair and sit halfway. Ask them to make sure that their neighbors are not leaning on the table or backrest or otherwise “cheating”. Mention that the seat-back exercise is continued during the presentation of the next rule.

When the second rule on work postures has been presented, release the participants from not using their seat backs. Ask how their backs feel. Everyone would agree that they felt strain on their backs in just a few minutes of exercise. Emphasize that the strain would be much more for someone who works in an awkward position and performs tasks repeatedly and for a long time. Stress that in addition to correct work height, chairs with a good back and cushion help keep productive work.

### **Key activity 13 Curve-tracking exercise**

The purpose of this exercise is to demonstrate the benefits of work done within easy reach in terms of comfort and work efficiency. Distribute to each participant two copies of the curve-tracking exercise form (Figure 1). Ask them to place a copy in front of them at the far right and about 30 cm below the edge of the table. Explain that they are to track the curves on the form using a pencil, starting from the left end of each curve and moving to the next curve after reaching the right end. Do this curve tracking for 30 sec., and ask them to count the number of curves tracked while excluding those curves for which the pencil crossed the limit lines. Then ask them to place the other form just in front of them and do the same tracking for 30 sec. Let them count the number of curves tracked, and compare the results with the previous results. The participants would confirm that the number of curves tracked increased in the second trial. Stress that it is important to do the work within easy reach and in a comfortable posture, and that this increases productivity.

Depending on the time available, you may choose a different way to run this exercise (for example, by asking a question about advantages of an appropriate work height).

### **3. Potential questions and answers**

The following are potential questions that may be asked by participants in the course of running this session and sample answers by the trainers. There may be other questions but most of them are relatively easy to answer by studying carefully the “Action Manual”.

#### **Question 4 Why is elbow height adequate for work?**

**Answer 4** At the elbow height position, the elbows and the upper part of arms can remain near the body. Thus, the least force is required to hold your arms in the working position. This makes the hand movement easier and more precise. It also makes it easier to keep a natural posture, reducing the muscle load of the shoulders and the back. Besides, the elbow height is appropriate for handling controls, work items and keyboards.

**Question 5 Why do we need to avoid a bending posture?**

**Answer 5** To keep a bending posture (forward bending of the upper body), muscles in the back must work hard to sustain the heavy weight of the head and the upper body. These back muscles are not adapted for keeping a bending posture for a long time. That is why we feel low back pain so easily when keeping a bending posture even for a few minutes. Furthermore, the muscles are stretched in bending posture so that they get fatigue easily. All these means that the work done in a bending posture is of low quality. Avoiding a bending posture is one of the basic principles for efficient work.

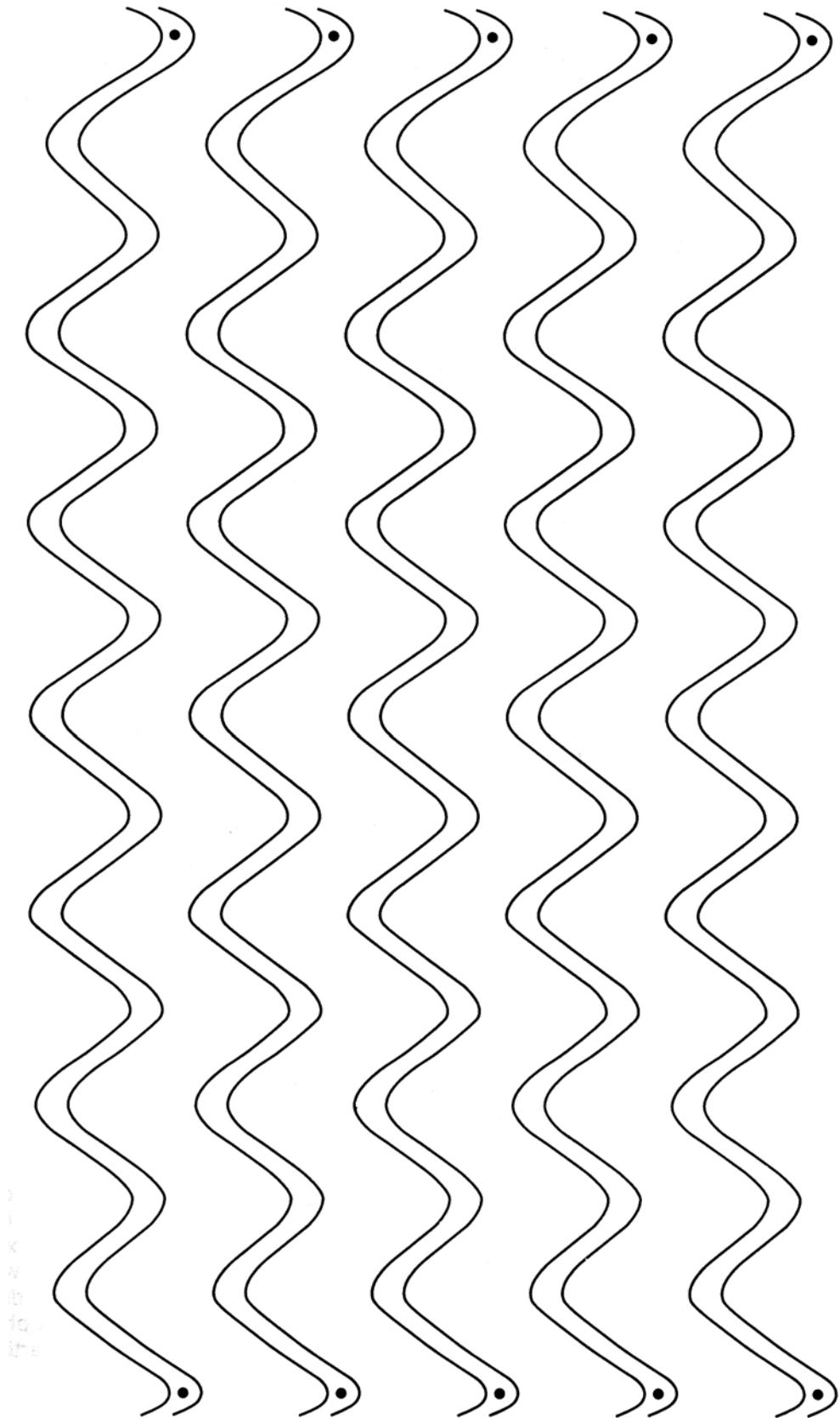
**Question 6 Why is alternate standing and sitting while at work useful?**

**Answer 6** Keeping the same posture for a long time easily causes fatigue of muscles working to keep the posture and hinders blood circulation particularly in the legs and the back. Continued use of muscles disturbs blood flow in the muscles and is therefore tiring. By alternating postures from standing to sitting and from sitting to standing, muscle fatigue is prevented. In addition, alternating the postures means changing the way work is done, which is good for keeping the worker alert and productive.

**Question 7 How can we make displays and controls distinguishable at low cost so as to minimize mistakes?**

**Answer 7** The best way to make different displays and controls easily distinguishable from each other is by using different colors and providing easy-to-read labels. This can be done at very low cost. Establish a rule for using different colors, for example, green for on-switches and red for emergency cut-off switches, or the same color for the same type of displays in different positions. Labels should use large letters in short phrases. Do not forget to make the emergency switches particularly visible.

**Figure 1: The task sheet for the “curve-tracking” exercise.**



### ***UNIT 3. PRODUCTIVE MACHINE SAFETY***

Objectives	<ul style="list-style-type: none"> <li>- Identify key ideas for improving machine safety in particular by feeding and ejection devices and by choice of the right type of machine guards.</li> <li>- Understand better that workers can work efficiently with a safe machine.</li> <li>- Point out simple but effective measures to increase both machine safety and productivity.</li> <li>- Describe some useful examples of improved productive</li> </ul>
Duration	35 - 45 minutes
Outputs	Participants trained in basic principles of productive machine safety
Methods	Presentation / Group discussion
Training Tools	Checklist, slides and transparencies showing good local examples

#### **Suggested Training Plan**

##### **Introduction**

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
<p>1. Give the title of the unit session. Mention that better materials handling and work-station design can improve safety and productivity at work together as we have seen in previous sessions, and that isolating accident dangers of machines can similarly improve productivity. Stress that the purpose is to find ways of making work safer while at the same time improving the efficiency of available machines and equipment. Indicate the exact time when the session will end. Invite participation in a similar manner as in the previous session.</p>	Presentation	Transparency	2-3 min.

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
<p>2. Show some slides giving an example of multiple improvements done on machine safety in an enterprise, possibly from a participating enterprise. Invite participants to comment on such an example. Present using a transparency, a list of ideas which will be discussed. To make them more appealing, you can use the “how to” and “why” format, such as:</p> <ul style="list-style-type: none"> <li>- how to increase productivity by a simple feeder;</li> <li>- how to select reliable machine guards which do not reduce efficiency;</li> <li>- how to increase workers’ safety consciousness; and</li> <li>- why the use of personal protective equipment should be a very last resort.</li> </ul>	Presentation and discussion	Slides and transparencies	4 min.

### **Rules on safe feeding**

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
<p>3. Show slides of several practical improvements using feeding and ejection devices to increase productivity and reduce injury hazards. If a sufficient number of slides taken from participating enterprises are not available, show the slides taken previously. Show transparencies giving different types of feeder found in the “Action Manual”.</p>	Presentation and discussion	Slides (you may add transparencies showing good arrangements in the “Action Manual”)	7-10 min. (for 3 and 4)
<p>4. Present the rule:</p> <ul style="list-style-type: none"> <li>- Use feeding and ejection devices to and increase productivity and reduce discussion machine hazards.</li> </ul> <p>Ask participants what the benefits in the use feeders and ejectors are. Invite comments from participants and try to discuss the advantages and benefits of such mechanical arrangements in comparison with mere safety precautions.</p>	Presentation and discussion	Transparency	

### Paper-folding exercise

Key activities	Method	Media	Time
<p>5. Ask four participants to fold a paper cup out of a square sheet of paper on the table. Show them how to make such a cup by actually making one. Before starting paper folding (origami), put two felt pens, vertically standing about 20 cm. apart, at the edge of the table in front of two participants. Ask them to do paper folding in the space between the two pens without touching the pens. Tell the other two to do paper folding freely on the table. When the cups are completed, compare the speed of producing a cup and ask the four participants how they felt. The insecure feeling and difficulty of concentrating on the work while trying not to touch the pens may be mentioned. Stress the importance of eliminating such insecure areas at work.</p>	Exercise	Square sheets of paper, about 15x15 sq. cm. (colored paper is better, even better if origami paper is available)	7-10 min.

### Rules on machine guards

Key activities	Method	Media	Time
<p>6. Show slides of different types of machine guards; fixed, interlocking, adjustable and two-hand controls. You may add slides taken from workplaces other than those of the participants. Then show one or two slides of machines without safety guards and ask where the danger of getting injury is at work and what types of guards would be useful. Invite comments about the influence on productivity of installing these guards.</p>	Presentation and discussion	Slides (you may add transparencies showing good arrangements in the "Action Manual")	7-10 min. (for 6 and 7)
<p>7. Present the rule: Use the right type of guard. Explain different types of guards available using transparencies showing examples illustrated in the "Action Manual". Invite comments from the participants.</p>	Presentation and discussion	Transparencies	

## Brainstorming exercise

Key activities	Method	Media	Time
8. Ask participants “Why do workers try to avoid the use of personal protective equipment?” Record their answers on a board or chart. Draw the conclusion that the equipment causes some inconvenience, needs proper maintenance and may reduce productivity. It tends to be expensive and considerable supervisory efforts are needed to ensure that workers use it. The equipment therefore should only be used as a last resort.	Exercise	Transparency	7-10 min.
9. Present the rule: - Eliminate the hazard, or install guards, Presentation Transparency 2 min. or as a last resort, use personal protective equipment - always in this order.	Presentation	Transparency	3 min.

## Conclusion

Key activities	Method	Media	Time
10. Summarize using a transparency of all the machine safety rules. Mention that all are covered in the “Action Manual”. Where appropriate, illustrate these rules with slides. Invite questions and comments (comments about the relation to productivity are most relevant).	Presentation	Transparency	3 min.

## *NOTES FOR TRAINERS*

### **1. Session design**

**Background** It should be kept in mind that the time available for this session does not permit systematic coverage of the most important aspects of occupational safety. The session is restricted to machines and emphasizes points closely related to productivity. It should not be treated as a standard lecture on machine guarding. As in other sessions, lecturing from professional points of view must be avoided.

Perhaps, the most convincing part of the session relates to feeding and ejection. Machines equipped with effective feeding and ejection devices are safe and productive. It is essential to present low-cost, locally made and innovative examples both for feeding and ejection equipment and for guards. This presentation should constitute a large part of the presentation (15-20 minutes). Numerous slides should be shown. The owners of the factories concerned can be asked to explain their experience about introducing improvements or about difficulties. And the rest of the participants should be encouraged to ask questions.

In safety, the best idea of all is to remove the hazard entirely. This idea is workable by most feeding and ejection devices as workers are no longer exposed to the danger of putting their hands into operating points. A complete enclosure of the power transmission part of machines also does the same. Therefore, it is useful to put a special emphasis on feeding and ejection equipment and on complete enclosures. Purchasing safe machines with such arrangements is a good policy.

If you cannot eliminate a hazard, attach a guard around it. However, guards may be removed by someone (maintenance workers who forget to put the guards in place again) or even by the workers themselves who feel that guards disturb their operations. Therefore, guards must be very carefully designed so as not to disturb operations or not to make maintenance work too complicated. Interlocking systems are thus very effective as removing guards simply stops operations. But remember, appropriately placed guards which do not necessarily have interlocking mechanisms are still very useful to prevent direct contact with hazards.

It is well known that by just providing personal protective equipment, does not ensure that it will be used. Even if a lot of effort is put into persuading workers to use personal protective equipment, we cannot be absolutely certain that it will be used properly at all times. We therefore strongly recommend that personal protective equipment be used as the last resort. When it is used, utmost care must be made to ensure its constant and correct use.

Thus, in running the session, try to convey the message that safety action should always be in the following order:

- First: Remove or substitute the hazard with a less dangerous machine or process.
- If this is impossible: Erect guards around the hazard.
- As a last resort: Provide personal protective equipment until the hazard can be eliminated or guarded.

**Sub-units**    **The session is divided into four sub-units:**

<i>Sub-unit</i>	<i>Purpose</i>	<i>Time available</i>
Introduction	To arouse interest	6-7 min.
Presentation of rules and examples	To communicate ideas and motivate implementation	15-20 min.
Paper-folding exercise	To reinforce awareness of proper guarding	7-10 min.
Brainstorming exercise on personal protective equipment	To convince participants that personal protective equipment should only be used as a last resort	7-10 min.
Conclusion	To provide a summary and overview	5 min.

**Time limit**    **Respect the time limit of 45 minutes. It is essential to have a rehearsal of your session.**

## **2. Exercises**

### **Key activity 5 Paper-folding exercise**

This exercise is conducted before the presentation of the rules on machine guarding. Ask four participants to fold a paper cup out of a square sheet of paper on the table. Show them how to make such a cup by actually making one (this is one of origami techniques).

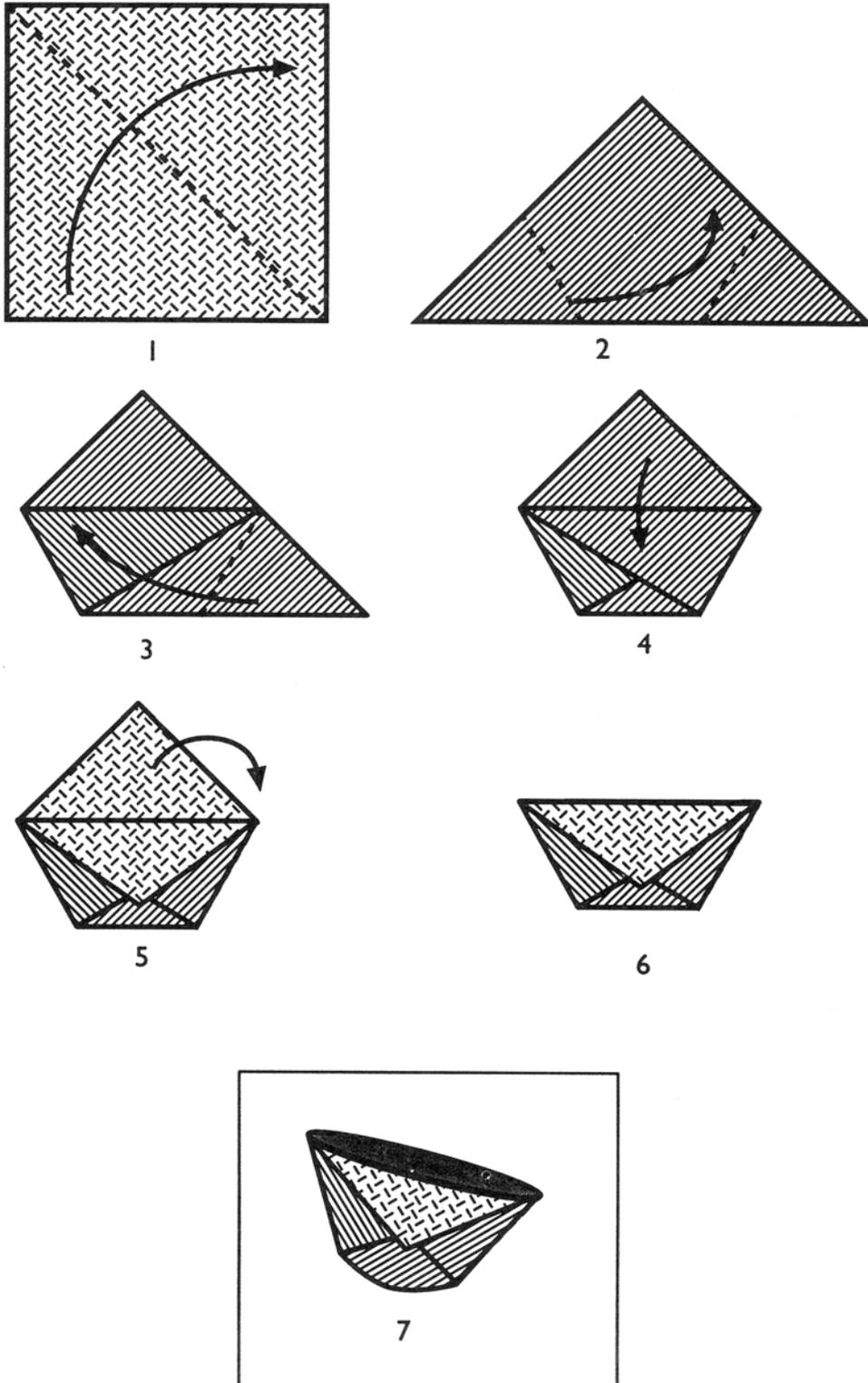
Take a square sheet of paper of about 15X15 sq. cm. The folding procedures are as follows (Figure 2):

- 1) Fold along a diagonal line (with the colored side outside) to get a triangle.
- 2) While placing the triangle with the above diagonal line facing you (becoming a bottom-side line), fold the left part so that the left-bottom end reaches the right-side line with the folded portion of the left-side line becoming parallel to the bottom line.
- 3) Fold similarly the right part so that the right-bottom end reaches the left-side line with the folded portion of the right-side line becoming also parallel to the bottom line.
- 4) Fold towards you the top small triangle portion above these parallel lines so that the internal white side of this small triangle appears outside.
- 5) Fold away from you the other top small triangle portion still left above these parallel lines so that the internal white side of this small triangle appears outside.
- 6) The cup is ready for use by making the two top parallel lines round.
- 7) The cup should look like this illustration. If a sheet of paper of good quality (say, the quality of photocopy paper), the cup is good enough to keep water for a while for drinking purposes.

Before asking the four participants to start paper folding, put two felt pens, vertically standing about 20 cm. apart at the edge of the table in front of two participants. Ask them to do paper folding in the space between the two pens without touching the pens. Tell the other two to do paper folding freely on the table.

When the cups are completed, compare the speed of producing a cup and ask the four participants how they felt. The insecure feeling and difficulty of concentrating on the work while trying not to touch the pens may be mentioned. Stress the importance of eliminating such insecure areas at work.

Figure 2: How to fold a “paper cup” using a square sheet of paper



### **Key activity 8 Brainstorming exercise on personal protective equipment**

Ask the participants “Why do workers try to avoid the use of personal protective equipment?” Record their answers on a board or chart. They may mention the inconvenience at work, unpleasant feeling especially in a tropical climate, the lack of knowledge about the potential hazards, the unavailability of equipment fit for the workers, poor maintenance or the lack of training in the use of such equipment. Draw the conclusion that the equipment causes some inconvenience, needs proper maintenance and may reduce productivity. It tends to be expensive and considerable supervisory efforts are needed to ensure that workers use it. Based on this conclusion, confirm with the participants that the equipment therefore should only be used as the last resort. This means, every effort should be made to avoid the existence of hazards and to enclose or screen the hazards’ source so that the workers need not necessarily use the equipment. But do not forget that the personal protective equipment must be regularly used in the circumstances wherein workers are not protected from the hazards. Good program for training and maintenance as to such use of equipment is essential in order to ensure its regular use.

### **3. Potential questions and answers**

The following are potential questions that may be asked by participants in the course of running this session and sample answers by the trainers. There may be other questions, but most of them are relatively easy to answer by studying carefully the “Action Manual”.

**Question 8** **Machines with a complete set of safety devices are usually expensive and it may also happen that such machines are not readily available. How can we solve these problems?**

**Answer 8** Yes, the price of a machine with safety guards is often higher. You may have to spend a little more time to obtain a safer machine. But we should consider that safe machines are more productive and ultimately less expensive than unsafe machines. In using unsafe machines, workers have to pay unnecessary attention to avoiding injury risks and cannot concentrate well on the work unlike in the case of using safe machines. Accidents, once they occur, cost you much and greatly hamper production. You must also remember that putting safety guards afterwards is more expensive than purchasing a machine with built-in safety devices.

**Question 9** Introduction of feeding and ejection devices often means considerable expenses and may also mean that some workers have to be assigned to other jobs. Is it still worth considering?

**Answer 9** Yes, if you can introduce efficient feeding and ejection devices that increase productivity. There are many such types by which productivity and work quality are greatly improved. This makes it easier to expand your business. As a result, the assignment of workers to different jobs will benefit both the enterprise and workers.

**Question 10** Workers often complain that work is disturbed by attaching safety guards. What can we do in this situation?

**Answer 10** If the safety guards are actually disturbing work, they should be adapted so as not to disturb work. It is important to attach appropriate types and shapes of guards which do not interfere with visibility, operation or maintenance. It may happen that workers feel their work is faster without a guard, but this underestimates the effects of unsafe working on overall productivity and product quality. It is necessary to establish a firm rule about using safety guards all the time for all workers.

#### **UNIT 4. CONTROL OF HAZARDOUS SUBSTANCES**

Objectives	<ul style="list-style-type: none"> <li>- Identify basic ideas for improving the control of hazardous substances by means of simple and inexpensive ways of dealing with them</li> <li>- Understand better that improvement of the most obvious problems in dealing with hazardous substances often result in cost savings and productivity benefits.</li> <li>- Point out some basic low-cost measures to control hazardous substances that are immediately available for small and medium-sized enterprises.</li> <li>- Describe some useful examples of improved control of hazardous substances in the Philippine context.</li> </ul>
Duration	35 - 45 minutes
Outputs	Participants trained in basic principles of control of hazardous substances
Methods	Presentation
Training Tools	Slides and transparencies showing good local examples

## **Suggested Training Plan**

### **Introduction**

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
<p>1. Give the title of the unit session. Emphasize that there are simple and inexpensive ways to improve the control of hazardous substances. These various ways are available for small and medium-sized enterprises, although some measurement and control measures need to be carried out by specialists. Stress that simple improvements often result in cost savings and productivity benefits. Indicate the exact time when the session will end.</p>	Presentation	Transparency	2 min.
<p>2. Show some slides giving examples of workplace where workers are dealing with hazardous chemicals in some of participating enterprises. Invite participants to comment on such examples, especially to mention how these chemicals affect the work being done and the health of workers. Then stress also that protective measures can lead to cost savings and increased productivity. Present a list of ideas to be discussed in the session using the “how to” format:</p> <ul style="list-style-type: none"><li>- how to replace expensive solvents with other chemicals;</li><li>- how to improve local ventilation without increasing electricity consumption;</li><li>- how to reduce loss of chemicals and save energy.</li></ul>	Presentation and discussion	Slides and transparencies	3-5 min.

### Rules on substituting chemicals

Key activities	Method	Media	Time
3. If available, show samples of organic solvent-based paints and water-based and solvents. Pass them around to the participants. Using transparencies of illustrations found in the “Action Manual “, mention that it may be possible to replace organic solvents used by many small enterprises with less dangerous substances. Examples include water-based solvents for paints and soap instead of solvents used in degreasing.	Presentation and discussion	Samples of hazardous and less hazardous chemicals, transparencies showing good arrangements in the “Action Manual “	7-10 min. (for 3 and 4)
4. Present the rule: - Replace a dangerous substance with a less dangerous one. Ask participants whether they now examples of introducing less hazardous chemicals or eliminating a hazardous process. Invite comments from participants and try to discuss the advantages and benefits of such arrangements in their own enterprises.	Presentation and discussion	Transparency	

### Rules on using covers and isolating hazardous sources

Key activities	Method	Media	Time
5. Show slides of containers and equipment with lids or covers that reduce dangerous and wasteful evaporation of chemicals. Examples can include cans, baths, mixing drums and improvised containers used at work. You may use slides taken from workplaces other than those of the participants. Then present slides showing the use of enclosures or separate rooms to minimize risk areas. Invite comments about the influence on productivity in applying these measures.	Presentation and discussion	Slides (you may add transparencies showing good arrangements in the “Action Manual”)	7-10 min.

### Rules on cost- effective ventilation

Key activities	Method	Media	Time
6. Present slides showing good natural ventilation, the use of ventilators placed appropriately at high parts of walls and local exhaust systems. If sufficient examples are not available, use transparencies of illustrations in the “Action Manual”. Discuss why many workers avoid the use of personal protective equipment. Discuss also how general and local ventilation can remove contaminated air.	Presentation and discussion	Slide and transparencies	7-10 min. (for 6 and 7)
7. Summarizing the discussion, the following rules: <ul style="list-style-type: none"> <li>- Use natural air flow to reduce air contamination;</li> <li>- Make local ventilation cost-effective;</li> <li>- Clean properly – don’t spread dust;</li> <li>- Use personal protective equipments the last resort.</li> </ul> Invite comments on these rules.	Presentation and discussion	Transparencies	

### Push and pull exercise

Key activities	Method	Media	Time
8. Place an electric fan on a small table and turn it on. Prepare a bunch of thin paper strips and hold it for a while just in front of the fan where wind is blowing (pushing). Then place the bunch of strips behind the fan where air is sucked in (pulling). Demonstrate pulling by finding the closest distance with no exhaust effect. Pushing is then again demonstrated at the same distance and then double and triple this distance to show the much stronger effect. Ask why there is a	Exercise	An electric fan, thin paper strips and a carton duct	10-15min.

Key activities	Method	Media	Time
<p>difference in the strength of air flow. In the second part of this exercise, provide a thick paper (carton) duct covering the back side of the fan and show the difference in the air pulling strength with and without the duct. Also, place the bunch of thin paper strips at different positions in relation to the entrance of the duct and compare the pulling strength. Invite comments from participants. Summarize that while pushing makes a stronger air flow, pulling with ducts and hoods is adapted to collecting hazardous substances.</p>			

### Conclusion

Key activities	Method	Media	Time
<p>9. Summarize using a transparency of all the machine safety rules. Mention that all are covered in the “Action Manual”. Where appropriate, illustrate these rules with slides. Invite questions and comments (comments about the relation to productivity are most relevant).</p>	Presentation	Transparencies and slides	3 min.

## *NOTES FOR TRAINERS*

### **1. Session design**

**Background** As in the case of the machine safety session, it should be kept in mind that the time available for this session does not permit systematic coverage of the control of chemical risks. It is not intended to cover all problems where protection is required by laws and regulations. The session is restricted to suggesting available simple solutions and emphasizes points closely related to productivity. It should not be treated as a standard lecture on chemical risks. As in other sessions, lecturing from professional points of view must be avoided.

The session tends to work well if you follow the suggested training plan, but it may need to be modified to take into account the characteristics of the participating enterprises. If a significant number of the participants' enterprises have a particular hazard, it is worth assigning a large amount of session time for discussion of this problem and practical solutions to it. Do not hesitate to cut short the time spent on the less relevant rules. It is important to have prepared in advance some specific examples, relevant locally, of substitution possibilities.

Try to get in advance samples of organic solvent-based paints and water-based paints. They give an outstanding example of how dangerous chemicals can be substituted by less dangerous ones. It may be difficult to get slides showing this substitution rule and the samples are therefore important. Likewise, it may be difficult to get slides showing good local exhausts. In that case, try to use slides from workplaces other than those of participants. This means that you should start preparation for technical sessions like this session quite in advance, so that you have time to contact labor inspectorate or occupational safety and health centers in time.

Also, in the case of chemical risks, the best idea of all is to remove the hazard entirely. This idea is helped by the substitution rule or complete enclosure of the chemical process. The difficulty associated with the use of personal protective equipment is also true with chemical risks. You cannot be absolutely certain that it will be used properly at all times. You therefore strongly recommend that personal protective equipment is used as a last resort. Thus, also in this session, try to convey the message that action should always be in the following order: First: Remove or substitute the hazard. Second: Use effective local ventilation. Third, as a last resort: Provide personal protective equipment until the hazard can be eliminated or reduced to a safe level. It must be stressed that it is necessary to contact specialized professionals if technical help is needed.

**Sub-units**    **The session is divided into four sub-units:**

<i>Sub-unit</i>	<i>Purpose</i>	<i>Time available</i>
Introduction	To arouse interest	5-7 min.
Presentation of rules and examples	To communicate ideas and motivate implementation	25-30 min.
Push and pull exercise	To reinforce awareness of proper local ventilation	10-15 min.
Conclusion	To provide a summary and overview	3 min.

**Time limit**    **Respect the time limit of 45 minutes. It is essential to have a rehearsal of your session.**

**2. Exercise**

**Key activity 8 Push and pull exercise**

This exercise is conducted after the presentation of the rules on the control of hazardous substances. The purpose is to understand the characteristics of local ventilation and the need to carefully deal with local exhaust systems. This is important as the capability of exhaust devices, fans or ventilators to remove polluted air is very limited. Remember, exhaust systems used in operations such as spray painting, grinding, degreasing and welding are often inadequate. This limitation and the need of a good system are best understood by knowing the difference between pushing and pulling air.

Place an electric fan on a small table and turn it on. Prepare a bunch of thin paper strips and hold it for a while just in front of the fan where wind is blowing (pushing). Then place the bunch of strips behind the fan where air is sucked in (pulling). Demonstrate pulling by finding the closest distance with no exhaust effect. Pushing is then again demonstrated at the same distance and then double and triples this distance to show the much stronger effect. Ask why there is a difference in the strength of airflow.

In the second part of this exercise, provide a thick paper (carton) duct covering the backside of the fan and show the difference in the air pulling strength with and without the duct. Also, place the bunch of thin paper strips at different positions in relation to the entrance of the duct and compare the pulling strength. Invite comments from participants. Summarize that while pushing makes a stronger airflow, pulling with ducts and hoods is adapted to collecting hazardous substances. Explain that pushing air is not adequate as it will often create turbulence and scatter polluted air. Dust that has been deposited on machines and equipment may also be scattered

by pushed airflow. Mention may be done about a “push-pull” system by which pushing air can be used in combination with effective “pulling” ventilators to avoid working in winds coming from the dust source. In the case of solvents and other chemicals that evaporate into air, it is advisable to use effective local exhaust systems that have enough pulling power. This need for effective exhaust systems should be emphasized.

### **3. Potential questions and answers**

The following are potential questions that may be asked by participants in the course of running this session and sample answers by the trainers. There may be other questions, and it is advisable to feedback correct answers if necessary by contacting specialized professionals.

**Question 11 In using organic solvents, it is troublesome to put on a lid to the container each time. Why is it necessary to use a lid or cover to control hazards?**

**Answer 11** Most kinds of organic solvents evaporate very easily so the concentrations of hazardous vapors are high around the workers using the solvents. Putting on the lid is very important to prevent this and to avoid the loss of expensive raw material. In case the container of solvents falls down, the lid or cover can keep them inside.

**Question 12 Why is the airflow stronger in ventilation using a pushing method than using a pulling method?**

**Answer 12** The speed of ventilating airflow is decided by the power of the fan and the size of the area for which the airflow is being produced. That means given the power of the fan, the air velocity depends on the airflow size. In the case of a pushing method, the airflow size being produced is small and the resultant air speed is high. In the case of a pulling method, on the other hand, the airflow size being produced is obviously large so that the air speed is usually quite low.

The pushing method, however, scatters the air and may not be appropriate for getting rid of contaminated air from the workplace. Therefore a pulling method can be favorable if it is combined with a duct and hoods (as typically seen in a local exhaust system). In that case, you can get a strong airflow being pulled through a duct because the airflow size is limited by the duct and hoods used.

**Question 13 How often should we change the filter of a gas mask?**

**Answer 13** Filters attached to gas masks need to be changed with new filters after having been used for some time as the capacity to catch hazardous gases saturates with time. This saturating time depends on both the gas-catching capacity of the filters and the gas density

in the workplace air. It is advisable to decide on the interval of changing filters at each workplace by knowing the filter capacity and the estimated concentrations of the gases for which the filters are used and to change the filters periodically each time this interval is surpassed. Usually, such an interval is easily decided by looking at the instructions obtained from the dealer of the gas masks and knowing the approximate gas concentrations. It is often difficult to decide on this interval of changing filters if the gas concentrations at a workplace change frequently or the operating time of dealing with the gas sources is irregular. In such a case, it is advisable to change filters at least before the workers using the mask feel the smell of organic solvents when wearing the mask in the morning (or at the beginning of a work shift). Precautions are necessary if the smell of the concerned hazardous gases is weak or nonexistent. If there is doubt about the appropriateness of changing intervals of filters, expert advice (through the dealer) should be sought. And do not forget to provide a clean box or container with a lid to keep the masks.

## ***UNIT 5. LIGHTING***

Objectives	<ul style="list-style-type: none"> <li>- Identify key ideas for improving lighting taking into account many aspects of good lighting.</li> <li>- Understand better how productivity and work quality are raised and workers' eyestrain reduced by good lighting conditions.</li> <li>- Point out low-cost measures to improve lighting in the many aspects of good lighting (intensity, direction, balance between local and general lighting, glare and task background).</li> <li>- Describe some useful examples of improved lighting in the Philippine context.</li> </ul>
Duration	35 - 45 minutes
Outputs	Participants trained in basic principles of control of hazardous substances
Methods	Presentation
Training Tools	Slides and transparencies showing good local examples

## **Suggested Training Plan**

### **Introduction**

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
<p>1. Give the title of the unit session. Emphasize that there are a variety of simple and expensive ways to improve lighting at the workplace. State that lighting is very important in trying to improve productivity and working conditions together especially in small and medium-sized enterprises. Stress that many lighting improvements can be made at little or no cost, and that they can even save money. If possible, describe a striking example of benefits of good lighting in one of the participants' enterprises. Indicate the exact time when the session will end.</p>	Presentation	Transparencies	2-3 min.
<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
<p>2. Present a list of ideas to be discussed in the session using a transparency or posters, such as:</p> <ul style="list-style-type: none"><li>- how to reduce your electricity bill by using natural light;</li><li>- how to get better lighting out of existing fixtures;</li><li>- how to increase productivity and quality by using local lighting and avoiding glare;</li><li>- how lighting maintenance can save your money.</li></ul>	Presentation or posters	Transparencies	3-4 min.

### Exercise on adequate light

Key activities	Method	Media	Time
<p>3. Distribute copies of the form annexed to this module. Explain how it is used. For each of the two trials, participants will be given one minute to draw lines connecting every second corner of each figure. Demonstrate on a board or flipchart. In the first trial, darken the room so that the task is difficult. Give them one minute to complete trial 1 and be sure they stop promptly at the end. At this point in time, ask participants to approximately measure the distance between the eyes and the form. In the second trial, raise the lights to a good level and give the participants one minute to complete trial 2.</p> <p>Also, at the end of the trial, the distance between the eyes and the form is measured. Ask each participant to indicate how many drawings were made in each trial and calculate the increase in productivity. Then ask them how many drawings were unclear or in error. This is an indication of poor quality. Also ask how the eye-form distance differed between the two trials. Participants would confirm that the distance increased in trial 2. Emphasize that poor lighting causes visual fatigue and reduces productivity and quality.</p>	Exercise	Form for exercise on adequate light	10-12 min.

### Rules on use of daylight

Key activities	Method	Media	Time
4. Present slides showing good sources of daylight such as: skylights, use of translucent plastic roof panels and windows placed high up. Also, show workstations with high lighting requirements placed close to windows. Ask participants what are the merits of using natural light.	Presentation and discussion	Slide	7-10 min. (for 4 and 5)
5. Present the rule: - Make full use of daylight. Ask participants to mention various ways of making use of daylight. Write them on a board or flipchart. Examples will include skylight, windows at high places, walls and ceiling painted in light color, cleaning of windows and precision work placed near windows. Then show a transparency listing all these measures and commend the good insight of the participants. Stress that these various ways of using daylight can reduce electricity bills	Presentation and discussion	Transparencies	

### Rules on avoiding glare

Key activities	Method	Media	Time
6. Show slides of workstations with natural light coming from the side, lamps with deep shades, mat work surfaces without reflected glare. Then present slides showing a machine operator facing a window or an open lamp in front of a worker. Invite comments about the influence on productivity and quality of work.	Presentation and discussion	Slides (you may add transparencies showing good arrangements in the “ Action Manual”)	7-10 min. (for 6 and 7)

Key activities	Method	Media	Time
<p>7. Present the rule:</p> <ul style="list-style-type: none"> <li>- Avoid glare</li> </ul> <p>Ask participants what measures are useful for avoiding glare. List the measures mentioned on a board or flipchart. Invite comments on the applicability of these measures in participants' own enterprises. Summarize the discussion by showing transparencies giving tips on how to avoid glare, including:</p> <ul style="list-style-type: none"> <li>- using blinds, curtains, louvers shades and trees;</li> <li>- changing windows to translucent ones;</li> <li>- changing the position of light sources or work-stations;</li> <li>- deep shades or shades low enough or high enough to ensure that light bulbs or bright surfaces are outside the normal field of view;</li> <li>- mat surfaces without reflected glare.</li> </ul>	<p>Presentation and discussion</p>	<p>Transparencies</p>	

**Rules on reposition of light and local lights**

Key activities	Method	Media	Time
<p>8. Present slides of lowered position of light sources, groups of lights for groups of machines, local lights over or attached to machine and work tables. Ask participants to mention types of work for which local lights are useful. Stress the importance of local lighting for precision work and for aged workers. Summarize discussion by presenting the rule:</p> <ul style="list-style-type: none"> <li>- Find the right place for light sources.</li> </ul> <p>Mention various ways of ensuring sufficient local lighting levels using transparencies of illustrations in the "Action Manual".</p>	<p>Presentation and discussion</p>	<p>Slides and transparencies</p>	<p>7-10 min.</p>

## Conclusion

Key activities	Method	Media	Time
9. Summarize using a transparency of all the lighting rules. Point out that all are covered in the “Action Manual” and that some other useful hints are found there. Where appropriate, illustrate these rules with slides. Invite questions and comments (comments about the relation to productivity are most relevant).	Presentation and discussion	Transparencies and slides	3-5 min.

## **NOTES FOR TRAINERS**

### **1. Session design**

**Background** Lighting is a very appropriate subject to be taken up in a WISE course. The benefits of good lighting are clearly visible in terms of productivity and quality of work and in terms of workers' comfort and safety.

But lighting is a very complex subject to be discussed in a single session. It is therefore helpful to tell the participants that the "Action Manual" contains much more information than can be presented briefly. It should be kept in mind that lighting problems are difficult to illustrate by slides. This is simply because flash shots tend to hide the problems due to poor lighting. Therefore, try to use as many slides from participating enterprises as possible showing good lighting situations that are very visible from the slides. There are many aspects of good lighting. They include light intensity, direction of light reaching the work item, balance between general and local lighting, glare, task background and maintenance problems. These will vary considerably according to the task carried out and the eyesight of the workers. Take these points into account and try to stress those aspects which are particularly relevant to many participants.

As all these aspects relate to productivity, mention repeatedly the importance of lighting in increasing productivity. A special exercise has been designed in order to demonstrate that lighting affects productivity.

Many of the ideas for better lighting help save the money spent for electricity bills. The use of natural light and repositioning of lights are particularly good examples. This cost saving aspect should be emphasized in the presentation of rules and in concluding remarks.

**Sub-units** **The session is divided into four sub-units:**

<i>Sub-unit</i>	<i>Purpose</i>	<i>Time available</i>
Introduction	To arouse interest	5-7 min.
Exercise on adequate light	To understand the relation between good lighting and productivity	10-12 min.
Presentation of rules and examples	To communicate ideas and motivate implementation	25-30 min.
Conclusion	To provide a summary and overview	3-5 min.

**Time limit** Respect the time limit of 45 minutes. It is essential to have a rehearsal of your session.

## **2. Exercise**

### **Key activity 3 Exercise on adequate light**

This exercise is conducted before the presentation of the rules on good lighting. The purpose is to understand the relationship between good lighting and productivity. The exercise also allows participants to learn a useful way of knowing if the existing lighting level is adequate or not without measuring the illumination level.

Distribute copies of the form annexed to this module (Figure 3; see p.61 of the “Trainers’ Manual”). Explain how it is used. For each of the two trials, participants will be given one minute to draw lines connecting every second corner of each figure. Thus, a six- sided figure would have a triangle drawn inside it. Circles are to be ignored. Participants should follow the numbers. They are to be careful about quality. Demonstrate on a board or flipchart.

In the first trial, darken the room so that the task is difficult. Give them one minute to complete trial 1 and be sure they stop promptly at the end. At this point in time, ask participants to approximately measure the distance between the eyes and the form.

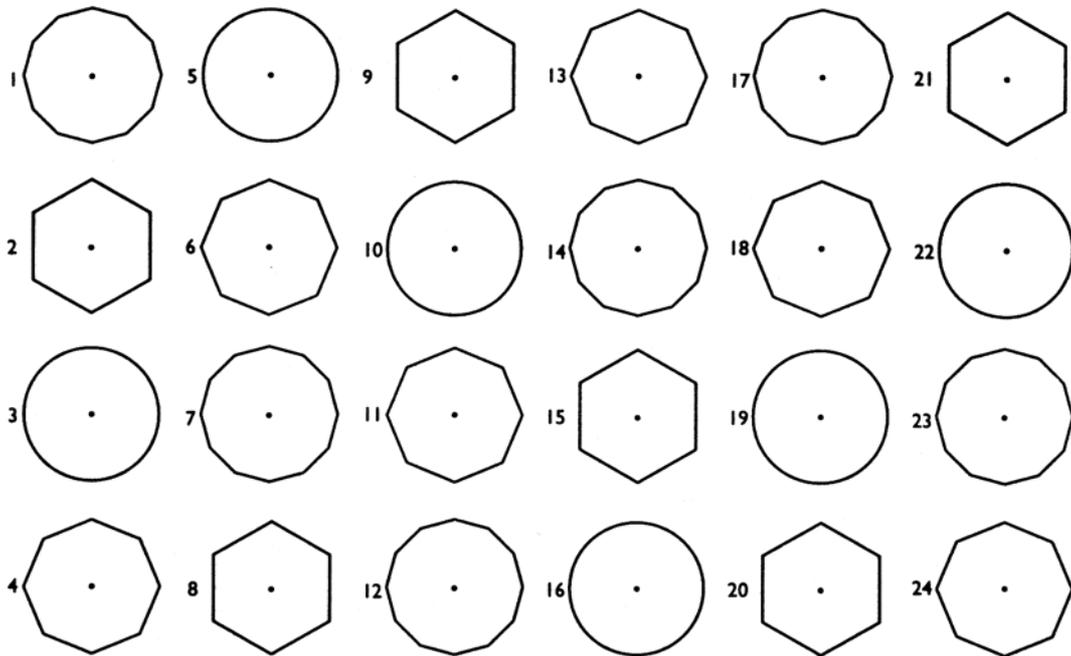
In the second trial, raise the lights to a good level and give the participants one minute to complete trial 2. Also, at the end of the trial, the distance between the eyes and the form is measured.

Ask each participant to indicate how many drawings were made in each trial and calculate the increase in productivity. Then ask them how many drawings were unclear or in error. This is an indication of poor quality. Also, ask how the eye-form distance differed between the two trials. Participants would confirm the distance increased in trial 2.

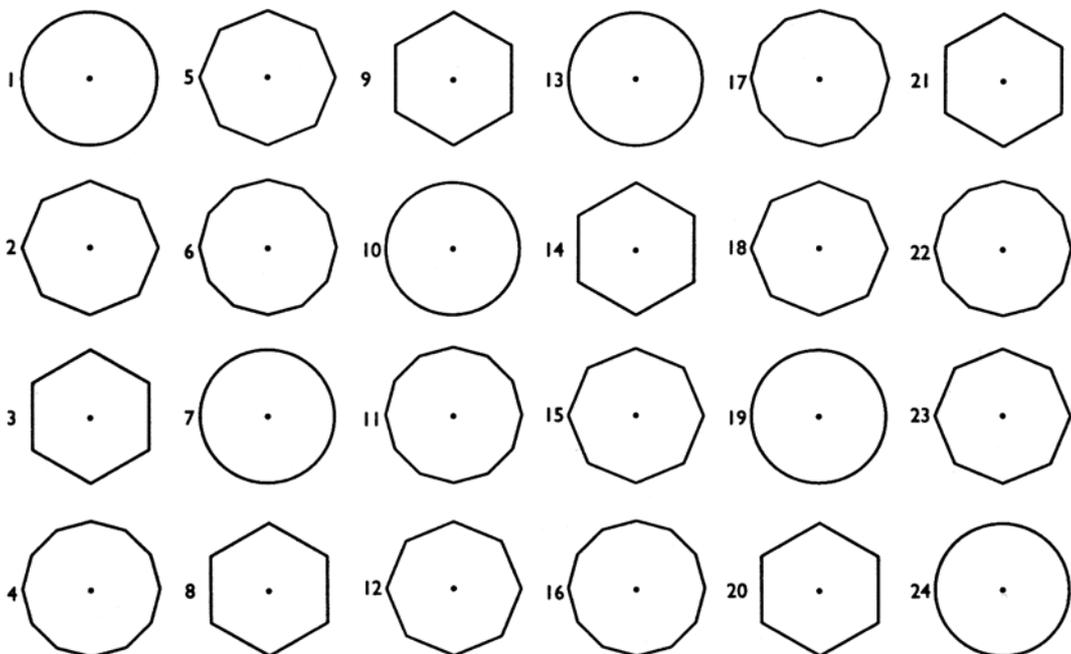
Emphasize that poor lighting can be identified by knowing if the eye-work item distance increases under an increased lighting level. End the exercise by pointing out that poor lighting causes visual fatigue and reduces productivity.

Figure 3: Form for exercise on adequate light.

Exercise 1



Exercise 2



### **3. Potential questions and answers**

The following are potential questions that may be asked by participants in the course of running this session and sample answers by the trainers. There may be other questions, and it is advisable to feedback correct answers if necessary by contacting specialized professionals.

**Question 14** Skylights can increase brightness, but at the same time they may bring heat into a workplace. How can we prevent the heat from skylights?

**Answer 14** Increase of inside temperature by the heat coming through skylights is usually not very significant, because the area of skylights is much smaller compared with the total area of the roof. Normally, one or a few skylights of a size of 0.5-1 m. X 1-2 m. can greatly improve the workplace brightness without causing heat radiation problems. If the heat radiation through skylights is really a problem because the sun beam through the skylights is hitting the workplaces directly or for other reasons, consider the use of semi-transparent materials or the provision of canopies or external shades over the skylights.

**Question 15** Sufficient lighting of the place where work is being done is certainly necessary. Why is it necessary to light up other parts of the workplace by adding general lighting?

**Answer 15** If the place where work is being done is bright and the neighboring parts are dark, this disturbs the work itself. In a bright place, the pupils of the eyes become small to limit the light coming into the eyes (adaptation to brightness). As a result, things in very dark neighboring places cannot be seen easily and work safety is disturbed. Large differences in brightness in a workplace must be avoided. A good combination of general lighting and local lights is needed. This also explains the reason why we must avoid sharp shadows within a workplace.

**Question 16** Why is it important to have a simple visual task background?

**Answer 16** If the background behind the work item you are looking at is simple, you can identify the work item without any extra effort. If the background is complicated with many things and colors, your eyes are disturbed by these distracting details. Simple backgrounds reduce mistakes in operation as well as the workers' eyestrain. Simple backgrounds thus increase productivity.

## ***UNIT 6. WORK-RELATED WELFARE FACILITIES***

Objectives	<ul style="list-style-type: none"> <li>- Identify key ideas for improving welfare facilities taking into account the most basic and essential work-related welfare facilities;</li> <li>- Understand the benefits of well-organized welfare facilities in terms of motivation, good industrial relations and productivity;</li> <li>- Point out low-cost measures to improve welfare facilities that are available for small and medium-sized enterprises;</li> <li>- Describe some useful examples of good welfare facilities in the Philippine context.</li> </ul>
Duration	35 - 45 minutes
Outputs	Participants trained in basic principles of work-related welfare facilities
Methods	Presentation / Group discussion
Training Tools	Checklist, slides and transparencies showing good local

### **Suggested Training Plan**

#### **Introduction**

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
<p>1. Give the title of the unit session. Emphasize that there are many low-cost measures to provide good welfare facilities for workers in small and medium-sized enterprises. Ask participants to mention types of welfare facilities which are basic and essential. List them on a board or flipchart. Make sure that all the basic types of work-related welfare facilities are listed. Stress that as the participants agree, good welfare facilities contribute not only to the welfare of workers but also to production and better relations within the company.</p>	<p>Presentation and mini-exercise</p>	<p>Board or flipchart</p>	<p>5 min.</p>

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
<p>2. Present a list of ideas to be discussed in the session using a transparency or posters, such as:</p> <ul style="list-style-type: none"> <li>- how to reduce fatigue and maintain health of your workers by providing facilities meeting their needs;</li> <li>- how to be ready for emergencies;</li> <li>- how to make sure that rest means recovery;</li> <li>- how to attract and retain the best workers.</li> </ul> <p>Indicate exact time when the session will end.</p>	Presentation and mini-exercise	Transparency or posters	2-3 min.

### **Rules on upgrading the most basic facilities**

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
<p>3. Present slides showing drinking water arrangements, washstands and toilet facilities. Ask participants if any of them has recently improved these facilities and if so, why. Remind participants that if workers are denied of the facilities to meet their basic needs, problems eventually result. Stress that these facilities are really essential and that their provision represents the “image” of the enterprise and is appreciated by the workers to a great extent.</p> <p>Present the rule:</p> <ul style="list-style-type: none"> <li>- Make sure essential facilities serve their purpose.</li> </ul> <p>Use transparencies if necessary to show appropriate ideas which are not yet in use at the participating enterprises (based on illustrations in the “Action Manual”). Invite comments and questions from participants.</p>	Presentation	Slide and transparencies	7-10 min.

### Rules on first aid

Key activities	Method	Media	Time
<p>4. Show slides on first-aid boxes, portable first-aid kits, stretchers and vehicles ready for transporting victims in the case of an accident. Invite comments on similar facilities in the participants' enterprises. Present the rule:</p> <ul style="list-style-type: none"> <li>- Be ready for emergencies.</li> </ul>	Presentation and discussion	Slides (you may add transparencies showing good arrangements in the "Action Manual")	5 min.

### Rules on attractive low-cost facilities

Key activities	Method	Media	Time
<p>5. Present slides of facilities for rest, such as rest corners within or near workplaces and rest rooms with facilities for relaxing. Also, show slides of change rooms, lockers, showers, eating areas and canteens, storage for bicycles and motorcycles, recreational facilities and factory childcare rooms. If necessary, use illustrations in the "Action Manual". Ask participants what kinds of rest areas and furniture they provide for their workers. Ask also if they recently improved any of these facilities and if so, what were the reasons why. Summarize discussion by presenting the rules:</p> <ul style="list-style-type: none"> <li>- Make sure that the rest means recovery.</li> <li>- Use low-cost facilities to attract and retain the best workers.</li> </ul>	Presentation and discussion	Slides and transparencies	7-10 min.

### Costs and benefits exercise

Key activities	Method	Media	Time
<p>6. Ask the participants to estimate the weekly wage bills for a local enterprise with 25 workers (the number should be decreased or increased if the participating enterprises on the average have fewer or more workers). Write the consensus on a board or flipchart. Next, show a transparency of some welfare facilities which have been found in some of the better enterprises, such as a drinking fountain, lockers, eating areas, canteens, shelters for bicycles, etc. Show slides of each of the facilities. Get the participants' consensus estimate of annual costs for each of these facilities. List the cost next to the items on the facilities list. Add them up. The total costs can be compared with the annual wages calculated from the above estimated wages. Then ask the participants to list the possible benefits of good welfare facilities. Write them down. Ask the participants to compare benefits and costs. Encourage a short discussion. Finally, ask for comments on the feasibility of introducing improvements in the participants' own enterprises.</p>	Exercise	Slides and a board or flipcharts	15-20 min.

### Conclusion

Key activities	Method	Media	Time
<p>7. Make a final summary of discussed. Show a transparency of all the welfare facilities rules. Slides can be used to give additional visual support for each rule. Invite questions and comments (comments about the relation to productivity are most relevant).</p>	Presentation	Transparency and slide	3-5 min.

## **NOTES FOR TRAINERS**

### **1. Session design**

**Background** Work-related welfare facilities are quite often ignored. But remember, workers do need care during each working day. Workers need to drink water (essential especially in a tropical climate), eat meals and snacks, wash their hands, visit a lavatory and rest and recover from fatigue. If these essential needs are met comfortably, this is beneficial not only to workers but also to the enterprise. If not, workers' dissatisfaction can be costly as their work is affected and the relations within the enterprise are somehow hampered. Essential facilities are more than just a legal requirement. Therefore, this session is aimed at facilitating a good understanding of these needs and the benefits of providing the necessary facilities. A special "costs and benefits" exercise has been designed also for this purpose.

Several types of welfare facilities are basic and common for all small enterprises. They include provision of water or other beverages, sanitary facilities, first-aid equipment, and rest and eating areas. A particular emphasis is placed on these basic and essential facilities. Depending on local conditions, the other types of facilities can be considered in more or less depth. Feeding facilities, if not a well- equipped canteen, are often very important.

Lockers, transport facilities or services, storage for bicycles or motorcycles, recreational facilities and factory childcare rooms can be important additional facilities appreciated by workers. These are also dealt with. Organizing the session according to the rules helps to make the connection between welfare facilities and the goals of the participating employers.

The costs and benefits exercise usually results in a lively discussion which helps to emphasize its points. The idea that the benefits of welfare facilities outweigh the costs is essential. It is hoped that this idea is confirmed by this exercise.

**Sub-units** **The session is divided into four sub-units:**

<i>Sub-unit</i>	<i>Purpose</i>	<i>Time available</i>
Introduction	To arouse interest	7-8 min.
Presentation of rules and examples implementation	To communicate ideas and motivate	15-20 min.
Costs and benefits exercise	To show that benefits exceed costs	15-20 min.
Conclusion	To provide a summary and overview	3-5 min.

**Time limit** Respect the time limit of 45 minutes. It is essential to have a rehearsal of your session.

## **2. Exercise**

### **Key activity 6 Costs and benefits exercise**

This exercise is conducted after presenting the rules on welfare facilities. The purpose is to understand the relationship between costs and benefits of essential work-related welfare facilities. The exercise thus allows participants to understand that the benefits exceed the required costs.

Ask the participants to estimate the weekly wage bills for a local enterprise with 25 workers (the number should be decreased or increased if the participating enterprises on the average have fewer or more workers). Write the consensus on a board or flipchart. This amount equals to about two percent of average annual wages. Next, show a transparency listing some welfare facilities which have been found in some of the better enterprises, such as a drinking fountain, lockers, eating areas, canteens, shelters for bicycles, etc. Show slides of each of the facilities. Get the participants' consensus estimate of annual costs (if some facilities can be used for longer than a year, divide the total costs by the number of years of availability) for each of these facilities. List the costs next to the items on the facilities list. Add them up. The total costs can be compared with the annual wages calculated from the above estimated weekly wages. Usually, the costs of welfare facilities are relatively small compared with the annual wages. Then ask the participants to list the possible benefits of good welfare facilities. Write them down. Ask the participants to compare benefits and costs. Encourage a short discussion. Finally, ask for comments on the feasibility of introducing improvements in the participants' own enterprises.

## **3. Potential questions and answers**

The following are potential questions that may be asked by participants in the course of running this session and sample answers by the trainers. There may be other questions, but most of them are relatively easy to answer by studying carefully the "Action Manual".

**Question 17 Why is it necessary to provide drinking water, toilets and resting places near the workplace instead of a centralized location?**

**Answer 17** The frequency of going to drinking water, toilets and places for resting is quite high during working hours. If they are located near the workplace, workers can save much time. If they are located far from the workplace, workers do not only spend longer time to go there but also feel uneasy about using them and may not actually use them so frequently as needs arise. They get irritated or get more tired. Inconvenient locations of such facilities thus can mean lower productivity. It is worth investing a small amount of money for more convenient locations.

**Question18** **Providing welfare facilities is often difficult in small enterprises because of the lack of budget and space for them. Are these facilities necessary in small enterprises as they are so in large enterprises?**

**Answer18** It is true that welfare facilities are often seen as luxuries especially in small enterprises. But consider these facilities respond to the workers' basic needs. They are prerequisites for higher productivity. If you compare the cost for providing welfare facilities with the total production expenditures, the cost is usually not very large and quite cost-effective in view of the significant effects on workers' refreshment and satisfaction. Consider the extent to which worker are discouraged by not having good welfare facilities and the increased morale with such facilities. It is certainly worthwhile to provide good welfare facilities.

**Question 19** **What should be prepared for first aid?**

**Answel9** An adequate first-aid kit with instructions on how to use it, is necessary at each workplace. In the case of small injuries such a kit is of great help. You may save time this way. In the case of severe injuries, such a kit can often help prevent the injured worker's condition taking a turn for the worse. It is necessary to check the contents of each first-aid kit periodically and to train workers in what occasions and how they can use the materials for first aid. It is also absolutely necessary to make arrangements in advance on where and how to carry severely injured persons to a nearby clinic or hospital.

## ***UNIT 7. PREMISES***

Objectives	<ul style="list-style-type: none"> <li>- Identify basic ideas for improving premises by applying simple and inexpensive measures relevant to small and medium-sized enterprises.</li> <li>- Understand the link between improved premises and productivity through exchange of positive local experiences and better product quality.</li> <li>- Describe some useful examples of low-cost improvements in premises in the Philippine context.</li> </ul>
Duration	35 - 45 minutes
Output	Participants trained in basic principles of premises
Methods	Presentation / Group discussion
Training Tools	Checklist, slides and transparencies showing good local examples

### **Suggested Training Plan**

#### **Introduction**

<b>Key activities</b>	<b>Method</b>	<b>Media</b>	<b>Time</b>
<p>1. Give the title of the unit session. Emphasize that there are many low-cost measures to improve premises which are available to small and medium-sized enterprises. Stress that almost all improvements discussed in this course are more or less connected with work premises. And that in this session, some positive solutions related to factory buildings will be discussed by showing a few slides, giving outstanding examples of improvements at participating enterprises. Invite a few comments. Indicate the exact time when the session will end. State that active participation is important as in previous sessions</p>	Presentation	Transparency and slide	2-3 min.

### Rules on protection from heat

Key activities	Method	Media	Time
<p>2. Present slides of trees around the factory building, screens attached to the outside of walls, walls with thermal insulation and ceilings under metal roof. Ask participants what the benefits are. Confirm that all these help reduce solar radiation and heat penetration. Present the rule:</p> <ul style="list-style-type: none"> <li>- Protect your factory from outside heat.</li> </ul> <p>Show transparencies of illustrations showing effective shades and insulated wall based on the “Action Manual”.</p>	Presentation and discussion	Slides and transparencies	5-7 min.

### Rules on natural ventilation

Key activities	Method	Media	Time
<p>3. Present slides showing opening in the roof and high portions of wall for escape of hot air, high placement of exhaust fans and louver-type windows for horizontal airflow. Ask participants what advantages can be derived from these arrangements. Present the rule:</p> <ul style="list-style-type: none"> <li>Let natural air flow improve ventilation.</li> <li>- Use transparencies if necessary, to show appropriate ideas which are not yet in use at the participating enterprises (based on illustrations in the “Action Manual”). Invite comments and questions from participants.</li> </ul>	Presentation and discussion	Slides and transparencies	7-10 min.

### Rules on pollution sources

Key activities	Method	Media	Time
<p>4. Show slides of polluting machines Presentation isolated outside the building or in and screened corner. Ask participants discussion what kinds of benefits are gained by isolation of polluting machines or workstations.</p> <p>Present the following rule:</p> <ul style="list-style-type: none"> <li>- Eliminate or isolate sources of pollution.</li> </ul> <p>Show transparencies of illustrations showing effective isolation and exhaust systems based on the “Action Manual”.</p>	Presentation and discussion	Slides (you may add transparencies showing good arrangements in the “Action Manual”)	5-7 min.

### Rules on plant layout

Key activities	Method	Media	Time
<p>5. Present slides showing passageways kept clear with marked boundaries, use of protective barriers, use of modular equipment and furniture which is easy to move, well-arranged floors without obstacles, and overhead and uniform distribution of general lighting and supply lines. If necessary, use illustrations in the “Action Manual”. Also, show slides of unobstructed escape routes and clearly marked exits, appropriately placed fire extinguishers and main power switches in easy reach and clearly marked.</p>	Presentation and discussion	Slides and transparencies	7-10 min.

### Metal-roof exercise

Key activities	Method	Media	Time
6. Show slides of a workplace covered with metal roofs which are exposed to solar radiation and have no underneath protective insulation nor ceiling. Ask the participants to propose improvements to provide protection against heat. Write them down. Encourage discussion about the proposed measures. Finally, ask for comments on the feasibility of introducing improvements in the participants' own enterprises.	Exercise	Slides and a board or flipcharts	10-15 min.

### Conclusion

Key activities	Method	Media	Time
7. Make a final summary of issues discussed. Show a transparency of all the work premises rules. Slides can be used to give additional visual support for each rule. Invite questions and comments (comments about the relation to productivity are most relevant).	Presentation	Transparency and slides	3-5 min.

## ***NOTES FOR TRAINERS***

### **1. Session design**

**Background** Few small enterprises have premises which were especially designed to meet their various production requirements. Usually, production processes have been changed or expanded without really solving problems of space, ventilation and transport as well as fire and electrical hazards. Improvements in this area are sometimes expensive and often interfere with production flow. Changes tend to be held back until the situation becomes absolutely intolerable. What the owners need is not so much additional knowledge, but the motivation to start improvements. Motivation can best be developed through observation of positive local examples and exchange of ideas.

The advantage of well-designed buildings and their effects on productivity is rather obvious when we consider the protection of workrooms from outside climate, good airflow and ventilation, smooth floors and good plant layout. The benefit of fire prevention is also easy to understand. Therefore, the topics of this technical area are important to help participants understand the link between working conditions and productivity.

Keeping this in mind, this session should be built around a few impressive local positive examples, grouped by rules. The trainer should be especially careful in trying to emphasize positive solutions rather than problems and limitations.

It is important to know that almost all improvements are connected with work premises. Therefore, in this session, a particular focus should be placed on how to incorporate improvements into factory buildings so that the improvements will last long or can be flexibly adapted to future changes. Examples in the “Action Manual” are helpful to identify such improvements.

#### **Sub-units    The session is divided into four sub-units:**

<i>Sub-unit</i>	<i>Purpose</i>	<i>Time available</i>
Introduction	To arouse interest	2-3 min.
Presentation of rules and examples	To communicate ideas and motivate implementation	25-30 min.
Metal-roof exercise	To improve diagnostic and application skills	10-15 min.
Conclusion	To provide a summary and overview	3-5 min.

**Time limit** Respect the time limit of 45 minutes. It is essential to have a rehearsal of your session.

## **2. Exercise**

### **Key activity 6 Metal-roof exercise**

This exercise is conducted after presenting the rules on premises. The purpose is to sharpen application skills for finding feasible low-cost solutions. Metal roofs are quite often found without adequate protection from solar heat, and this exercise allows the participants to take into account the many problems of small enterprises in a tropical country such as the Philippines. Show slides of a workplace covered with metal roofs which are exposed to solar radiation and have no underneath protective insulation nor ceilings. Ask the participants to propose improvements to provide protection against heat. Write them down. Encourage discussion about the proposed measures.

Finally, ask for comments on the feasibility of introducing improvements in the participants' own enterprises.

## **3. Potential questions and answers**

The following are potential questions that may arise during the session and sample answers by the trainers. There may be other questions, but most of them are relatively easy to answer by studying carefully the "Action Manual".

**Question 20** How much heat coming from outside can a ceiling underneath the roof prevent?

**Answer 20** In a tropical climate, the heat radiation coming from heated roof materials is enormous. We should know that not only the hot air inside a workplace but also heat radiation from the roof are giving heat to the workers. If this heat coming from the hot roof is prevented, the workers feel much more comfortable and their heat stress is greatly reduced. If you install a ceiling underneath such a hot roof, it prevents heat radiation from the roof. This is because the temperature of the ceiling is much lower than that of the roof. Outlets of the air heated between the roof and the ceiling can help further reduce the temperature of the ceiling. A good ceiling is an effective means to keep the workplace cool.

**Question 21 What are the requirements for passageways within a workplace?**

**Answer 21** Passageways must be wide enough and free from obstacles to allow smooth flow of work and efficient transport. Two-way transport is a minimum requirement for any passageways connecting different workplaces. The width depends on the usual means of transport for that particular workplace. If pushcarts of a width of 50 cm. Are used, then a passageway width of about 125-140 cm. (50x2 plus 25-40 cm.) is needed. Minor passageways where transport is infrequent can be at least 75 cm., but keep such exceptions to a minimum. Passageways should be clearly marked or fenced. They should be without stumbling obstacles and free from piled materials and wastes.

**UNIT 8. WORK ORGANIZATION**

Objectives	<ul style="list-style-type: none"> <li>- Identify key ideas applicable to small enterprises for improving work organization in production;</li> <li>- Understand the positive impacts of better work organization on productivity and working conditions.</li> <li>- Describe some useful low-cost measures of improving work organization in the Philippine context.</li> </ul>
Duration	35 - 45 minutes
Output	Participants trained in basic principles of work organization
Methods	Presentation / Group discussion
Training Tools	Checklist, slides and transparencies showing good local examples

**Suggested Training Plan**

**Introduction**

Key activities	Method	Media	Time
1. Give the title of the unit session. Explain that prior to this last technical session, the most essential elements of working conditions and the working environment that provide a basis for productive work have been covered. But to be productive, work should be properly organized. State that this session therefore deals with	Presentation	Transparency	2-3 min.

<p>ways work is performed, and that this subject is somewhat different from previous subjects and the most difficult, but at the same time where the most potentially beneficial types of improvements can be obtained. Explain that this session basically consists of two exercises. Stress that participation is important. Indicate the exact time when the session will end.</p>			
<p>2. Explain that the purpose of this first exercise is to demonstrate how large the productivity benefits can be when tasks are analyzed and re-allocated. Start by showing a transparency or a poster of the part to be drilled (illustrated in (a) of Figure 138 in the “Action Manual” reproduced here as Figure 4). Ask the participants to suggest ways of doing the drilling work to get four holes for the part in a more efficient manner. Write down the suggestions on a board or flipchart. They should come up with the following ideas:</p> <ul style="list-style-type: none"> <li>- Get a multi-drill head to drill all the holes in one operation - (b) in Figure 4;</li> <li>- Make a jig to enable drilling a pile of plates in one operation - (c) in Figure 4;</li> <li>- Combine the above two ideas – (d) in Figure 4;</li> <li>- Redesign the product in such a way that some or all of the holes are no longer necessary.</li> </ul> <p>Use transparencies or poster for illustrating the first three possibilities. Show slides of examples of tools and machines which combine operations. Recommend that participants carefully examine operations in their factories and try to eliminate or combine some of them. Stress the importance of making such critical examinations before assigning the job to a worker or automating the operation.</p>	<p>Exercise</p>	<p>Transparencies or posters and slide</p>	<p>10-15 min.</p>

Key activities	Method	Media	Time
<p>3. Explain that this exercise is designed to allow the participants to discover the advantages of task combination, job enrichment and group work. Form groups of five participants each. Each group will produce about twenty paper helicopters, each doing a different operation. The fifth member of the group will test the products by dropping them to the floor. There will be one or two bottlenecks, and the members doing subsequent operations will have to wait. Ask the participants to suggest how this group work can be improved.</p> <p>Their ideas can include:</p> <ul style="list-style-type: none"> <li>- Combine some of the operations;</li> <li>- Create buffer stocks so that work is not paced;</li> <li>- Assign the whole work to each individual;</li> <li>- Organize round-table work so the work is done jointly and flexibly.</li> </ul> <p>Try one or two of the suggestions for a short while. Ask the participants to list potential benefits of group work done in a flexible manner. These should include:</p> <ul style="list-style-type: none"> <li>- less need of space;</li> <li>- easier supervision;</li> <li>- savings in time;</li> <li>- better feedback between the operators;</li> <li>- improved communication;</li> <li>- better use of skills.</li> </ul> <p>Summarize by indicating the benefits of having more responsibility and different skills as well as flexible group work.</p>	Exercise	Transparencies, rectangular sheets of paper and slides	20-25 min.

Key activities	Method	Media	Time
<p>4. Make a final review of the issues discussed. Show a transparency of the rules for effective organization of work:</p> <ul style="list-style-type: none"> <li>- Get rid of extra tasks and operations;</li> <li>- Defeat monotony to keep workers alert and productive;</li> <li>- Install buffer stocks to make the work flow smooth;</li> <li>- Design responsible, flexible jobs;</li> <li>- Set up autonomous groups to improve efficiency and to cut supervisory costs.</li> </ul> <p>Each rule should be reviewed for one or two minutes. One or two slides or transparencies (based on the “Action Manual”) can be used to give additional visual support. Point out that more information on this subject is available in the “Action Manual”. Invite questions and comments (comments in relation to productivity are most relevant).</p>	Presentation	Transparency and slide	8-10 min.

## ***NOTES FOR TRAINERS***

### **1. Session design**

**Background** The subject is particularly difficult to handle and particularly important. The ideas will be new to many of the participants. Some of them may even be puzzled by these new ideas which run counter to their old view. At the same time, most participants will consider that they know a great deal about work organization, as they are able to organize work on a day-to-day basis. They understand well that poor organization is usually the greatest limit on their productivity. We can certainly expect that although the ideas put forward are new, most participants will get interested in the subject.

The session design of this subject is different from the previous sessions. There are at least three reasons why the training technique used in the other technical sessions is not appropriate in this case:

- new forms of work organization are still relatively rare in small enterprises, and there is little chance of finding a sufficient number of examples during the limited time of factory visits;
- it is difficult to show work organization ideas using slides (video works much better);
- since new approaches contradict the traditional belief of small enterprises, it is unlikely that the presentation of examples can get them to take action.

Instead of trying to convince by examples, this session is built around two exercises which give the participants a chance to figure out for themselves what economic benefits can be obtained by changing the organization of work.

**Sub-units** **The session is divided into four sub-units:**

<i>Sub-unit</i>	<i>Purpose</i>	<i>Time available</i>
Introduction	To arouse interest	2-3 min.
Exercise on task elimination	To demonstrate productivity effects	10-15 min.
Exercise on group work	To overcome traditional attitudes about task division and simplification	20-25 min.
Conclusion	To provide a summary and overview	8-10 min

**Time limit** Respect the time limit of 45 minutes. It is essential to have a rehearsal of your session.

## **2. Exercise**

### **Key activity 2 Exercise on task elimination**

Explain that the purpose of this first exercise is to demonstrate how large the productivity benefits can be when tasks are analyzed and re-allocated. The illustrations in Figure 138 in the “Action Manual” are used in this exercise (reproduced in Figure 4). Start by showing in a transparency or a poster the part to be drilled (illustrated in (a) of Figure 4). Ask the participants to suggest ways of doing the drilling work to get four holes for the part in a more efficient manner. Write down the suggestions on a board or flipchart. They should come up with the following ideas:

- Get a multi-drill head to drill all the holes in one operation - (b) in Figure 4;
- Make a jig to enable drilling a pile of plates in one operation - (c) in Figure 4;
- Combine the above two ideas - (d) in Figure 4;
- Redesign the product in such a way that some or all of the holes are no longer necessary.

Use transparencies (or posters) for illustrating the first three possibilities. Show slides of examples of tools and machines which combine operations. Recommend that participants carefully examine operations in their factories and try to eliminate or combine some of them. Stress the importance of making such critical examinations before assigning the job to a worker or automating the operation.

### **Key activity 3 Exercise on group work**

Explain that this exercise is designed to allow the participants to discover for themselves the advantages of task combination, job enrichment and group work based on simple ideas. Mention that the traditional beliefs about the merits of the division of tasks and job simplification are today challenged by these new ideas, and that the participants may benefit from comparing these beliefs with the new ideas. Form groups of five participants each. Each group will produce about 20 paper helicopters while sitting in a row, each doing a different operation. Thirty rectangular sheets of paper of about 15 cm. x 2 cm. will be provided to each group. The participants in each group will do their tasks repetitively and as fast as possible. It is important that a group member places the “semi-product” resulting from his or her operation on the table so that the next member can easily take it for the subsequent operation. The fifth (last) member of the group will complete the production of a paper helicopter and test one by one by dropping the helicopter to the floor.

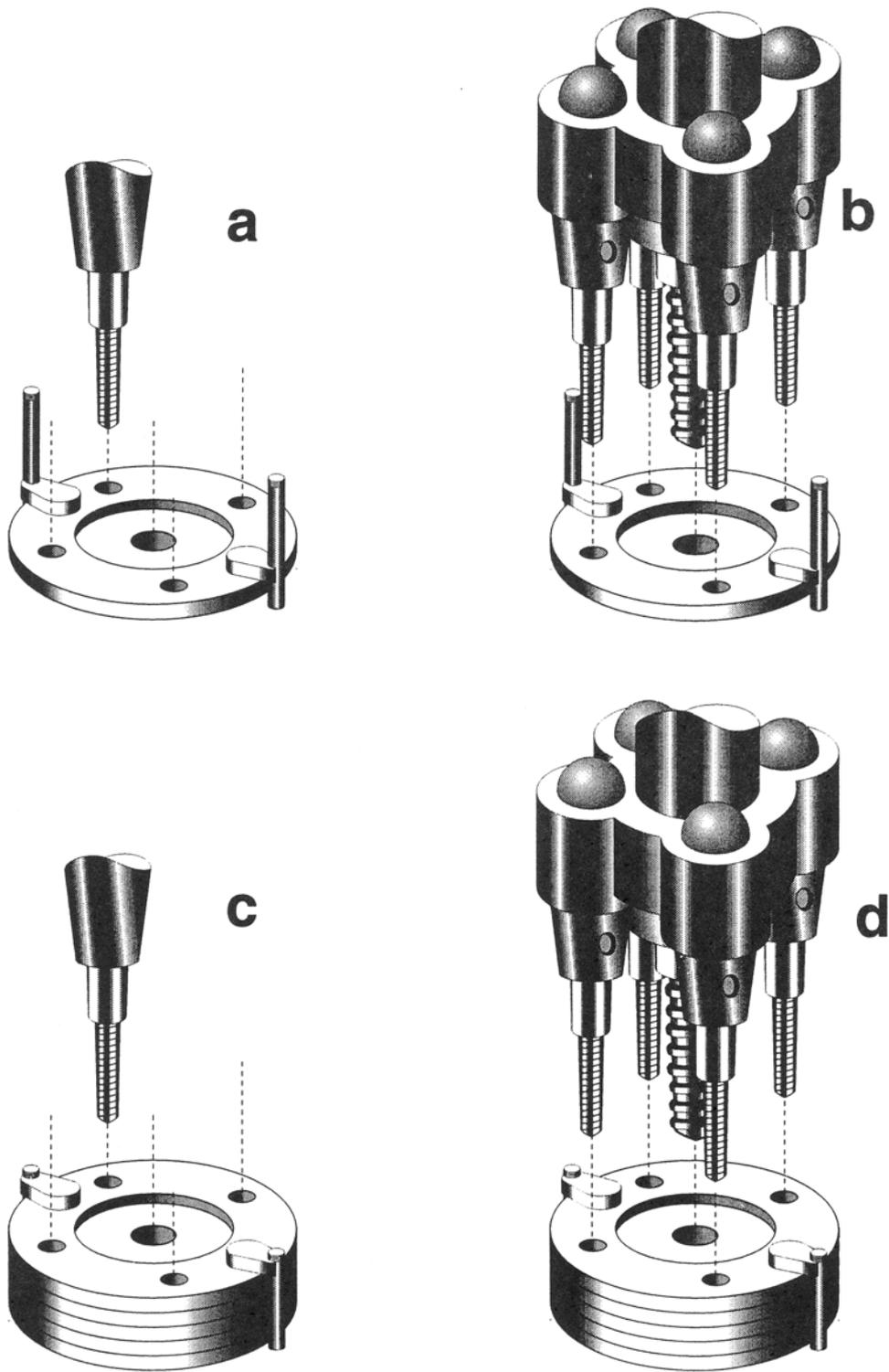
It is better to draw by a pencil two lines on each rectangular sheet of paper in advance, as shown in illustration 1 of Figure 5; a line (A) across the 2 cm. width at about 9 cm. from the bottom end, and another line (B) dividing the 2 cm. width from the middle of the top end up to about 5 mm. above the first line. These two lines will greatly help the folding operations.

The tasks assigned to each member of the group and instructions how to make a helicopter are explained in Figure 5.

- Member 1 (Illustrations 1 and 2 of Figure 5)
- 1) Take one sheet of the paper.
  - 2) Fold the bottom part of the sheet so that the bottom end will meet line A.
  - 3) Send the sheet to member 2.
- Member 2 (Illustration 3)
- 1) Split the width of the sheet into equal parts along line B up to about one-third of the sheet length.
  - 2) Make sure that the two split parts are seemingly equal and that the split line does not reach line A and stops at about 5 mm. above line A.
  - 3) Send the sheet to member 3.
- Member 3 (Illustration 4)
- 1) Tear the sheet from the left-side line up to the one-third width point along line A.
  - 2) Then tear the sheet similarly from the right-side line up to another one-third width point along line A.
  - 3) Send the sheet to member 4.
- Member 4 (Illustrations 5 and 6)
- 1) Fold the left one-third width below line A to meet the middle one-third portion.
  - 2) Fold the right one-third width below line A to meet the left one-third width portion already folded in 1.
  - 3) Send the sheet to member 5.

**Figure 4**

- (a) Drilling with a single-head drill.
- (b) Use of a multi-head drill.
- (c) Drilling a stack of parts with a single-head drill.
- (d) Drilling a stack of parts with a multi-head drill.



Member 5 (Illustration 7)

- 1) Fold the two split portions away from each other. This is done easily by holding the bottom half in illustration 6 by one hand and trying to give folding at the beginning part of each split portion by holding it between the thumb and the index finger.
- 2) Adjust the angle between the two split portions to become approximately 120 degrees.
- 3) Confirm by holding the bottom part using the thumb and the index finger of one hand, the total shape of the folded sheet looks like a “Y” shape if seen from the side.
- 4) Drop the paper helicopter to the ground to see that it rotates quickly by aerodynamic movement until it reaches the ground.

In making helicopters by serial group work, there will be one or two bottlenecks, and the members doing subsequent operations will have to wait.

Ask the participants to suggest how this group work can be improved. These can include:

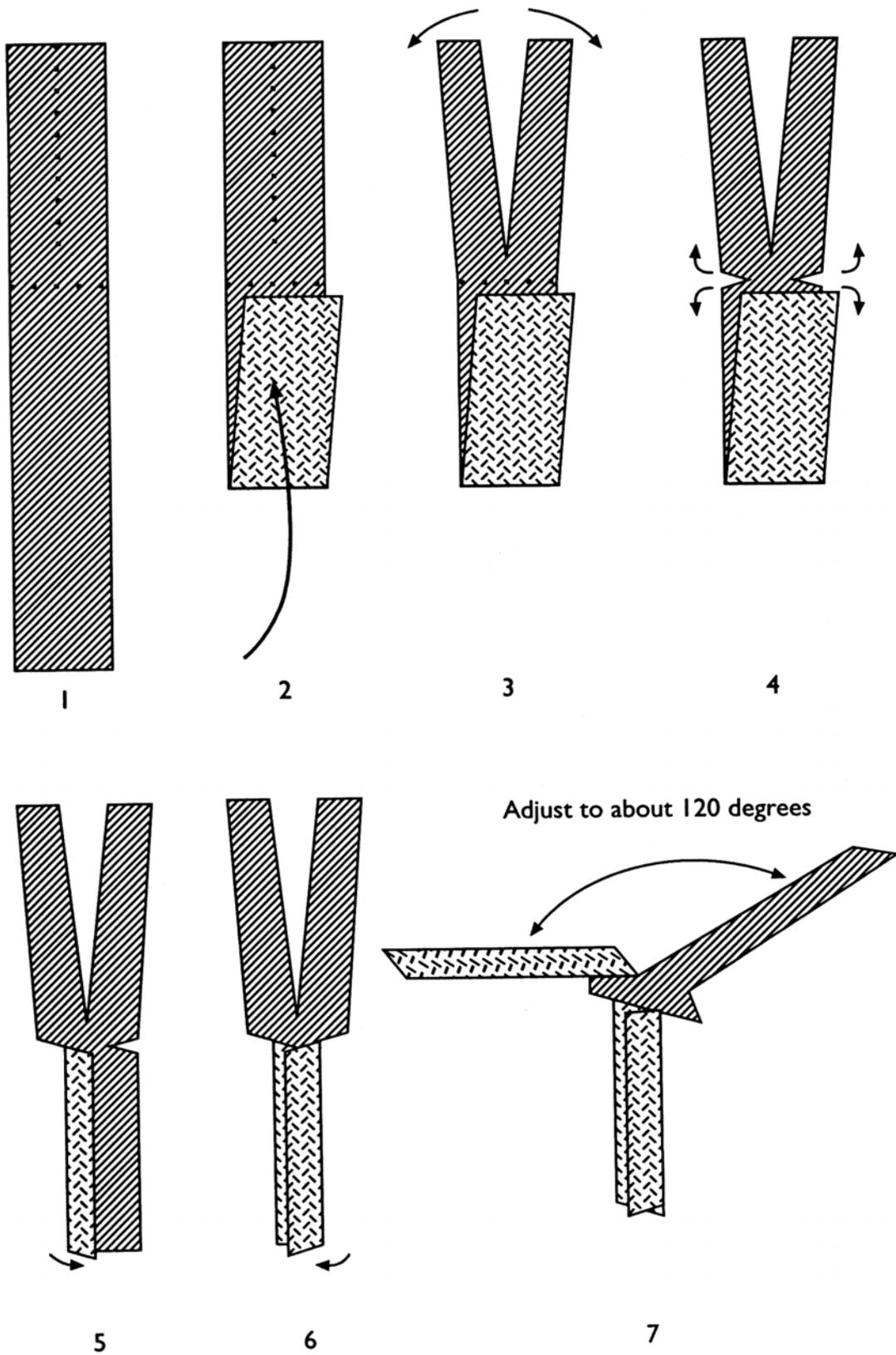
- Combine some of the operations to reduce the number of operators;
- Create buffer stocks so that work is not paced;
- Assign the whole work to each individual;
- Organize round table work so the work is done jointly and flexibly.

Try one or two of the suggestions for a short while. Ask the participants to list the potential benefits of group work done in a flexible manner. These should include:

- less need of space;
- easier supervision;
- savings in time;
- better feedback between the operators;
- improved communication;
- better use of skills.

Summarize by pointing out the benefits of having more responsibility and different skills as well

Figure 5: Different arrangements for performing the task



### **3. Potential questions and answers**

The following are potential questions that may arise during the session and sample answers by the trainers. There may be other questions, but most of them are relatively easy to answer by studying carefully the “Action Manual”.

**Question 22 Why is working in a group, for example, around a round table, favorable? Workers may chat with each other much.**

**Answer 22** The feeling of working together is usually conducive to productive work. In a round table setting, workers can communicate with each other without interrupting work. This stimulates the workers and keeps them alert. Workers do know when to concentrate fully on their work and such chances of communication do not disturb work quality. Besides, a round table setting help workers learn from the others and detect faults in the products.

**Question 23 I heard “buffer stocks” are a useful method of avoiding the negative effects of machine-paced assembly-line work. Is the method really useful in small enterprises?**

**Answer 23** In machine-paced assembly-line work, each worker has to complete the assigned tasks in time for the scheduled short period, so that the work item can be handed over to the next worker in time. This has been considered to be productive and applied as one of traditional production methods. But in modern thinking, this type of machine-paced work is considered to be counter productive. It is because the machine-paced work cannot consider differences in work skills and can cause fatigue easily to the workers. Thus, “buffer stocks” are used to eliminate such machine-paced work. Buffer stocks are small piles of goods before and after each machine or workstation. The idea is that each worker does not have to wait for the next work piece and can work at his or her own pace. This production method is particularly suited to small enterprises where the skill differences are large and where production changes can take place often. Besides, we should consider that in small enterprises, work is often interrupted because of machine problems or shortage of workers. Continuous supply of raw materials and parts is also difficult for small enterprises. So, keeping adequate amount of buffer stocks in the work process is in fact a good idea in small-sized production and is usually more productive than processes without buffers.

#### **STEP 4: Group Work for Preparation of Action Plans**

Development of action plans in each participating enterprise is one of the most exciting activities. For the participants, the creation of practical action plans is challenging and rewarding. The WISE technical principles which the participants have just learned will provide them with practical guides for their concrete actions. The participants should visit as many of the participants' enterprises as possible. This sharing process will strengthen the participants' problem analysis and diagnostic techniques. It also reinforces mutual support among group members which will last long even after the comprehensive training course is completed.

##### **Activity 1 - Completing the checklist exercise by each participant in his/her own enterprise**

Objectives	Identifying potential improvement areas in the participants' own enterprises.
Duration	About 1 day
Output	A list of potential improvement areas using technical principles
Methods	Filling out the action-checklist by applying the WISE into the existing conditions of their own workplaces.
Training Tools	Action-checklist

This is the beginning of the real participative parts of WISE. Entrepreneurs may face some difficulty in filling out the checklist since this is the first challenge to them. It is important to advise them to fill out the checklist in a relaxed mood. This advice will be useful because the relaxation will help participants keep broader views and reach flexible and innovative ideas for the improvement. They should be informed that their initial ideas will be later intermingled with other participants' ideas. This sharing process will enrich the improvement ideas and help them reach the realistic action points. It is highly recommendable to encourage the participants to ask for the opinions of their workers or fellow managers in filling out the action-checklist. The participants (entrepreneurs) will know what practical ideas their workers and colleagues have. The interactive discussions between workers and entrepreneurs in filling out the action-checklist will surely help in establishing the firm basis for implementing the improvements in the latter stage of the course.

## Activity 2 - Visit by participant groups to as many enterprises as possible

Objectives	Identifying opportunities for improvement in all participating enterprises by exchanging participants' different views.
Duration	2 - 3 days
Output	The participants will strengthen their skills in identifying the feasible improvement areas.
Methods	Workplace visits
Training Tools	Filled out action checklists Interactive discussion

It is important to visit the workplaces of group members in a friendly and pleasant manner. The participants must ensure that the group should not criticize negative points of their group member workplaces. Instead, they should be assured that the positive attitudes of learning good aspects from their fellow enterprises would increase the opportunities for identifying practical improvement points. It is also advisable that the host entrepreneurs should keep open and positive attitudes to the visiting group members. It is not a shame at all to show some points to be improved and to ask for advice from the group members. The host entrepreneurs should be proud of explaining their previous efforts in improving productivity and working conditions. This frank exchange of views will create a valuable opportunity for doubling their previous improvement experiences in a very realistic manner.

It is possible to organize group factory visits by several sub-groups. Each sub-group can visit all the sub-group member factories. Experiences of all the sub-groups should be later reported in the mid-course workshop. Some participants may say that they are too busy to join all the workplace visits. It is an important role of facilitators to remind the participants of the value of these technical visits. How can the participants develop such a rare opportunity of visiting many local workplaces with the view of productivity and work improvements? Convince them that this is a rewarding investment. Sincere discussions in the real workplaces will surely help the participants come up with wonderful ideas for the improvements.

## Activity 3 - Completing a form (Action Plan) in identifying potential improvements in each enterprise

Objectives	Establishing a concrete action plan in each enterprise.
Duration	About 1 day
Output	Firmly established improvement plans
Methods	Filling out the action plan form while exchanging views among different participants.
Training Tools	The Action Plan form A sample completed Action Plan to be used as a handout.

The week allotted for the group company visits and the preparation of action plans is approaching the highlight. The step of completing the Action Plan form will be the most challenging to the participating entrepreneurs. Here, they are requested to use up all their technical know-how obtained from both their own experiences and WISE technical sessions. Probably, they may select some simple and easy-to-implement actions first. At the same time, they may also develop some innovative ideas for improving their work environment. Very often, a fresh, innovative idea is born from the lively discussions between entrepreneurs and workers in their own workplaces. It is effective to advise the participants not to stick to one or two technical improvement areas. Often, they may pay most attention to one or two distinct technical areas in their workplaces. It is true that looking at multiple aspects will give them more opportunities to discover a number of possible improvement points.

It is useful to advise the participants to develop workable improvement ideas. They should consider the necessary inputs for the improvement such as materials, skills, budget and time. Previous experiences of WISE demonstrated that using materials and skills existing in their own local workplaces is the key for the success of action plans. Workplaces have some workers who are strong in particular types of skills such as carpentry, welding or designer jobs. Mobilizing these skills will create several advantages for making productive workplaces. First, local resources and skills are inexpensive. Second, the workers implementing the improvement process for their workplaces will be very proud of their assignments and increase their motivation to their work. Third, since the improvement processes are open to all workers in their workplaces, this will easily create more involvement of other workers. These self-motivation processes will further enhance the sense of belonging of the workers to their workplaces.

**Activity 4 - Developing entry for the “simple, inexpensive and clever” (SIC) contest**

Objectives	Motivating the participants to develop innovative and inexpensive improvement ideas.
Duration	About 1 day
Output	Improvement ideas entered into the SIC contest
Methods	Filling out the entry form for the “small, inexpensive and clever” contest.
Training Tools	The Action Plan form, A sample completed Action Plan to be used as a handout.

SIC (simple, inexpensive and clever) contest is an invention of the Philippines. This contest meets the intention of WISE that small workplace changes have a practical value. They are sustainable since they are rooted in local practice and resources. Attitude of receiving small changes as a firm step to the further growth of their enterprises should be encouraging to many local entrepreneurs. They will realize that they can do something or better things for their workplace improvements.

The inexpensive awards have the same context with the small awards. Inexpensive improvements have profound meanings for the wider changes of many local

workplaces. It is likely that expensive improvements can be done by anybody if they have money. Inexpensive improvements need more experiences and skills relying on local resources, and they are widely applicable in the local context. The clever awards are aimed at the improvement examples which are creative. Many clever improvement examples have been formulated based on the basic principles of WISE. The experiences on how awardees used up the local resources in an innovative way or how they can avoid their safety and health risks by changing their conventional attitudes will be highly appreciated.

### **STEP 5: Mid-course Visits/Workshop**

This step is important for facilitating the participants' actions. Trainers should visit the participants' factories or organize a mid-course workshop. The mid-course visits or workshop should be organized in a relaxed mood, where the participants can speak out their points to overcome constraints (technical or managerial). It would be encouraging if some participants have already completed some improvements. These participants can assist other entrepreneurs in implementing their action plans. It is also advisable to organize a mid-course workshop at a time when most of the entrepreneurs can easily attend. Evenings may be the best time for them to attend. It is the facilitators' role to make the mid-course visits/workshop most productive.

#### **Activity 1 - Visits to enterprises or group meetings**

Objectives	Learning the processes of the improvements by groups.
Duration	2 - 3 days
Output	Facilitated improvement actions
Methods	Walk-through investigation / Interactive discussion.
Training Tools	Action-checklist / Action plans / Previous improvement examples

Experiences of WISE have demonstrated that simple, frequent visits to workplaces often motivate the people to take actions than expected. The workplace people will accept the visits as a kind attention of many other colleagues and trainers. When they face technical difficulties, interactive conversation with friends will often lead them to the right directions. Ideas and knowledge from many other people are more powerful than those from one person. It is highly possible that people know the right places for obtaining necessary materials and skills to overcome the technical constraints of their group members.

Mid-course visits to group member factories will also stimulate the participants to accelerate their positive actions. The progress of their group members will provide lots of hints for solving the technical difficulties they are facing. Seeing workers' involvement in implementing the improvements will provide the participants with another positive impact. Management alone can have limited ideas, time and power. The participants will realize that mobilizing workers' support for implementing the improvement is critical for the survival of their enterprises. It is the facilitators'

technique to increase these inter-visiting effects for discovering the participant's unexploited potential for positive change.

**Activity 2 - Mid-course workshop (optional)**

Objectives	Sharing the process of changes.
Duration	3 - 4 hours (probably in the evening)
Output	Firmly established improvement ideas and designs
Methods	Presentation / Group discussion
Training Tools	Flip-chart / Slides / Transparencies

Organizing the mid-course workshop has practical value for accelerating the participants' improvement actions. Careful preparation is necessary for making the mid-course workshop a success. The key issues for implementing a successful mid-course workshop are:

- to select most useful periods when many participants are half finished with their improvements;
- to set aside the appropriate time so most of the participants can attend (probably in the evening);
- to develop photos or slides of the finished or half-finished improvements;
- to know the conditions of the implementation of each participant so that trainers can facilitate the discussion most effectively for supporting their improvements;
- to prepare the options for overcoming technical difficulties which the participants are facing by learning local available solutions;
- to facilitate the discussion about organizational aspects (in addition to technical aspects) of the improvements such as workers' involvement, mobilization of local resources and managing the progress of the improvements.

In the workshop, participants will present their action progress. It is highly recommendable to provide sufficient time (usually about 30 to 40 minutes) for them to prepare their presentations. It will be very helpful to use an overhead projector so that the participants can clearly show the progress of their actions on transparencies. It is also a good idea to utilize flip charts for showing their improvement processes.

It is highly likely that most of the participants will talk about the technical aspects of their improvements. However, when considering the future sustainability of actions, it is crucially important to share ideas on how to organize the action. The essential issues are the steps of the improvement planning, mobilization of workers' support, obtaining information for necessary materials and skills for continuing actions. It is worth remembering that this mid-course workshop is actually the seeds for developing a local network for sustainable actions in the future. It is true that many regions could succeed in the development of such networks after joining the WISE courses. WISE trainers are responsible for facilitating the development of self-sustaining improvement systems in the local conditions.

### Activity 3 - Advice regarding relatively difficult improvements

Objectives	Assisting participants in solving technical or managerial difficulties for implementing plan of actions.
Duration	About 2 to 3 days depending on the conditions
Output	Technical solutions regarding relatively difficult improvements
Methods	Group discussion
Training Tools	Action-checklist / Action plans / Previous improvement examples

This activity may be integrated into the mid-course visits or mid-course workshop. In any case, it is important to provide the participants with useful advice regarding relatively difficult improvements. WISE trainers may sometimes be challenged by relatively difficult technical questions to answer. How to respond to these technical questions is one of the most important roles of WISE trainers. It is highly recommendable to invite the answer from other participants before WISE trainers provide the solution. Experienced WISE trainers know the importance of local solutions. The WISE trainers come to the workplaces only on several occasions while the local people stay there. It would be much more appreciated if the local people could solve their technical problems by using their own supporting network.

However, in due course, WISE trainers should be ready to respond to any aspect of technical and managerial questions which may arise from the participants. For meeting this purpose, it is imperative to learn as many local examples and their implementing processes as possible. These lively materials are so impressive that the trainers will remember them more easily than the textbook style information. Further, the WISE project team has been developing several supporting tools for assisting the trainers' efforts.

- a set of good example slides attached in this training package;
- the Database management system;
- the Booklet of Philippine improvement examples;
- WISE topic flyers;
- Industry-specific Action Manuals for garments manufacturing, food processing, woodworking and metalworking industries.

Showing the WISE promotional videos in which many practical achievements are explained will assist your training purpose.

*Ergonomic Checkpoints*, newly published by the ILO will also serve as a valuable information source for strengthening your technical background.

*Productivity Performance Assessment System (PPAS)* will be helpful for answering the questions about evaluating the productivity gains by the improvement.

All these supporting tools and information are obtained through the regional labor offices or the Bureau of Working Conditions of DOLE.

#### **Activity 4 - Motivate groups to implement as many improvements as possible**

Objectives	Maximizing the participants' improved potentials in the local conditions.
Duration	About 2 to 3 days depending on the conditions
Output	Participants' commitment to carry out more number of improvements
Methods	Walk-through in their workplaces / Group discussion
Training Tools	Action-checklist / Action plans / Previous improvement examples

This activity may also be a part of the mid-course visits or the mid-course workshop. The purpose of this activity is to encourage the participants to carry out as many improvements as possible, whether simple or difficult, prior to the final workshop. The participants would obtain more experiences for the future survival and growth of their enterprises if they could implement a larger number of improvements. It is WISE trainers' role to remind them of the value of this opportunity.

Probably, WISE trainers can assist them in taking a fresh look again at their workplaces for finding new improvement points. Every workplace must have several outstanding problems to which people tend to stick. It is often true that they may overlook many feasible action points after implementing relatively difficult or outstanding improvements. Simply remind them that they can double the fruits of their efforts by looking at multiple aspects of their working conditions.

Some entrepreneurs may develop many small improvements. WISE trainers should pay equal attention to both outstanding and small improvements by mentioning that they are all firm steps for their further improvements. It is also necessary to challenge the entrepreneurs to implement rather complex improvements. The WISE trainers can assist them in making a long-term plan for the complex improvements. The entrepreneurs will learn much from developing long-term improvement schemes since they have to carefully consider the budget, manpower, implementing periods and necessary technical skills. These long-term improvement plans may not be accomplished before the final workshop. However, the entrepreneurs should be encouraged to present their long-term plans in the final workshop.

#### **STEP 6: Improvements in Enterprises and Preparation of Group Presentations**

##### **Activity 1 - Completing possible improvement activities**

Objectives	Advancing the work improvement within the assigned periods.
Duration	About 1 to 2 weeks
Output	The improvements the participants carried out

Methods	Implementing planned actions using local resources.
Training Tools	Good example booklet / Industry-specific Action Manuals

After the mid-course visits/workshop, all the participants will continue the implementation of the improvements with increased confidence. The time allotted to this step should be at least one week but not more than two weeks. It is important to set the time limit so that the participants will try to complete their actions in time. The participants should be informed that WISE trainers are anytime ready to accept their questions and provide technical advice during the implementing periods.

### **Activity 2 - Compiling necessary materials and information for the final workshop**

Objectives	Reviewing all experiences obtained from the improvement practices for the final presentation.
Duration	About half a day
Output	Compiled improvement experiences for the final presentation
Methods	Documenting the progress of the improvements / Illustrating some improvement examples.
Training Tools	Flip-charts / Transparencies

After the completion of their improvements, the group members should sit together for reviewing all the improvement experiences. Trainers should provide an appropriate time and place for this activity. The purpose of this process is for finalizing the preparation for the final presentation. This process has a practical meaning for future steps. The joint review of the concrete steps carried out by the group members will increase the understanding of the participants about WISE improvements. Sharing the real experiences of small, innovative steps for the improvements will make the fundamental technical base for continuing improvements. The group members will also be able to share their concrete experiences of “managing changes”. The experiences of how they could mobilize their workers’ support or how they could obtain necessary resources for the improvements in the local conditions will be of practical value.

Trainers should advise the participants to prepare clear presentations. Practical information in implementing the improvements such as the costs, materials and manpower used for practicing or installing the improvements should be included in their final presentations. It is advisable to encourage them to develop a flowchart or diagram for exhibiting the improvement processes and clear illustrations showing the improvement examples. They should be shown either on flip-charts or transparencies. It is imperative to ask them for their long-term plans which are to be continued. It would be of practical value if they could include possible plans for developing a local network in which the local entrepreneurs will continuously share the improvement experiences within their own initiatives.

The groups must also complete their entry to the “simple, inexpensive and clever” (SIC) contest.

### Activity 3 - Rehearsing the final presentation

Objectives	Preparing clear and positive presentations for the final workshop.
Duration	About half a day
Output	Well-prepared presentation package for the final workshop
Methods	Setting necessary presentation materials.
Training Tools	Transparencies Illustrations

The groups must have prepared slides, drawings and other visual aids with clear presentation texts and possible long-term plans. It is recommended that the group representatives take opportunities to rehearse the presentations in front of other group members to make the presentations more clear-cut. Active participants often try to talk much and put too detailed information in their presentation materials. This practice would reduce the rewards of their efforts since the audiences would not understand too detailed information at once. It is the responsibility of WISE trainers to assist them in making clear presentations. The previous experiences of practicing clear and crisp presentations as WISE trainers should be transferred to the participants.

### STEP 7: Final Workshop: Group Presentations

#### Activity 1 - Opening

Objectives	Providing public acknowledgment of the program as a whole.
Duration	15 - 20 minutes.
Output	Encouragement to the participants
Methods	Congratulatory greetings from guest speakers and organizers
Training Tools	Program of the Final Workshop

A short but crisp opening ceremony will increase the motivation of the participants to present their achievements effectively. Invite leaders in the local community such as the mayor of the city, leaders of management associations or labor unions. The speech from the head of the regional labor office would also be helpful in order to increase the sense of achievements of the participants. All the speakers may congratulate the WISE team for their achievements and mention that WISE approaches are very important for the social and economic development of the local society. Printed programs showing the names of guest speakers and group participants should be prepared. Participation of the local press will be very important. It is also advisable to invite as many local entrepreneurs and union members as possible who will be future participants of WISE training courses.

## Activity 2 - Group presentations

Objectives	Preparing clear and positive presentations for the final workshop.
Duration	2 to 3 hours depending on the number of groups
Output	Well-prepared presentation
Methods	Presentation, Interactive discussion
Training Tools	Slides, Transparencies, Flip-charts

This is the highlight of the training course. The presenters should be very proud of their achievements. Advise them to present their achievements with confidence. Conditions of slide and overhead projectors and other audio-visual aids should be carefully checked before starting their presentations.

Invite questions and comments from the audiences. The trainers themselves can give their comments for each presentation. The trainers' comments should be brief and positive, rather than critical or analytical so that the subsequent questions from the audiences will follow the same line.

Discussions on organizational aspects as well as on technical aspects should be promoted. It is the intention of WISE that growing improvements on productivity and working conditions will be done by using local resources and skills with the active involvement of workers and managers. The presenters will emphasize the importance of mobilizing workers' support and finding available local resources. The trainers are responsible for facilitating the positive discussions among the participants to convince them to sustain their improvements. Slides, transparencies and other presentation materials used in the final workshop should collect and duplicated. These presentation materials will be useful training instruments for the next training course.

## Activity 3 - SIC awards

Objectives	Giving the participants a sense of achievements and motivating them for further efforts.
Duration	15 - 20 minutes
Output	Shared sense of achievements among the participants
Methods	Selecting and providing each award
Training Tools	Certificate of the awards and small presents

There are two important purposes in the SIC awarding: encouraging the participants on continuing efforts; and convincing them on the importance of local solutions at low cost. The participants will understand better the concept of WISE improvements when they see what improvement examples get the awards.

The trainers should carefully observe all the group presentations and select SIC awards in a fair and balanced manner. It is a good idea to ask for some advice from the guest speakers to select the appropriate SIC awardees. However, the final decisions should always be made by the trainers themselves based on the previous WISE technical experiences. It is highly recommended that all the groups will be able to have some awards. Invited guests will be appropriate persons for giving the awards to the selected participants.

#### Activity 4 - Evaluation

Objectives	Finding the points for better organization of WISE training courses.
Duration	20 - 30 minutes
Output	Suggested plans for organizing the next WISE training courses
Methods	Filling out the evaluation sheet, Interactive discussion
Training Tools	Evaluation sheet

Direct and immediate feedback from the participants is an important source for organizing better WISE training courses. Frank and positive ideas for the improvement of the courses should be collected from the participants. It is wise to prepare an evaluation questionnaire sheet. The question items should cover the broad aspects of WISE organizing elements. They should include: participants recruitment, marketing programs, brochures, programs of the training, information covered in the technical sessions, the place of the training; training materials such as action-checklist, audio-visual aids used in the training; factory visits, mid-course visits/workshop and the organization of the final workshop.

Efforts should be made for assessing the WISE courses at various stages of the implementation. Such assessments will generally be designed to test:

- the participants' general approval of the course (or otherwise);
- the strong points and improvement points;
- the appropriateness of the timing of the course;
- the utility of particular sessions;
- the relevance of the course to the company's own needs;
- whether the participant feels he/she has learned something;
- what changes might be made in overall design, content, time or staffing.

Time should be allotted for the participants to directly speak out their suggestions for upgraded WISE training courses. Ideas and suggestions for continuing future actions or developing the local collaboration network should be most important. Efforts should be made among the local entrepreneurs for setting up a kind of sustaining follow-up mechanisms.

### Activity 5 - Closing

Objectives	Congratulating the achievements of participants and confirming their continuing efforts.
Duration	15 - 20 minutes
Output	Sense of fulfillment and the motivation for further action
Methods	Providing certificates for all the participants, Closing remarks from guest speakers and a representative of the participants.
Training Tools	Certificate and small presents (probably a copy of the Action Manual)

The certificate will be distributed to each participant. Some guest speakers may play this important role. After distributing the certificates, some congratulatory speeches from the guests will be provided. Speeches and remarks from the representatives of the participants should also be requested. They will appreciate the efforts of the organizers and confirm their continuing efforts for implementing actions.

A WISE trainer will close the training course by mentioning that all WISE trainers are happy to see the great accomplishments of the participants and their decision of continuing improvement efforts.

### STEP 8: Follow up

Follow up should be integrated into the original plan of the WISE courses. The follow-up visits to the enterprises will be useful for assisting the people in implementing action and knowing their future potential. Improved examples collected through the follow-up visits will be used as lively training materials in the next WISE training course.

### Activity 1 - Preparation of the follow-up visits

Objectives	Contacting the previous participants.
Duration	1 - 2 days
Output	Concrete plans of follow-up visits or meetings
Methods	Telephones / Letters
Training Tools	

Over the following three to six months, the previous course participants must have completed several actions. During this period of implementation in the enterprises, the difficulty may also arise in terms of workers involvement and motivation to implement changes. They should be encouraged to implement more planned actions.

Follow-up support may be necessary to help them overcome technical or managerial problems they may be facing. The previous participants will also be motivated to implement more actions by keeping in touch with each other throughout this process. Thus, follow-up visits have practical values for implementing improvements systematically.

The first step for the follow up is contacting the previous participants by phone or by letters. Probably, after the short greetings, trainers can make appointments to visit their workplaces. If their workplaces are distant, several trainers should share the visit plans.

Organizing a follow-up meeting will be necessary if the participating enterprises are located in a distant area from the trainers' offices. For this, communication to the group leaders or coordinators will be necessary for asking their help in contacting other participants and deciding on the venue and date for the meeting.

### **Activity 2 - Follow-up visits**

Objectives	Direct visits to the previous participants' workplaces and assisting them in implementing further improvements.
Duration	1 - 2 weeks
Output	List of the achieved improvements and overcoming the technical and managerial difficulties of the improvement
Methods	Direct visits / Workplace walk-through / Interactive discussion
Training Tools	Good example booklet / Action Manuals / Follow-up sheets Low-cost improvement sheet

During the follow-up period, the companies should be visited by resource persons who may be trainers or group coordinators. Ideally, there should be involvement of participant group members in these visits. The resource persons should be prepared to learn from the accomplished achievements and record them into the low-cost improvement sheet. Besides the technical aspect of the improvement, the strong points of the managerial aspect of the company such as workers involvement or resources mobilization should be properly described in the follow-up sheet.

The visiting resource persons should be ready to give advice or to provide information on specific sources of assistance. Newly developed WISE Database Management System (DBMS) will also provide practical information for overcoming technical constraints. Entrepreneurs can access to the WISE DBMS through the computers equipped in the regional labor offices. Participants may also be encouraged to meet on an informal basis (independent of the resource persons) to discuss common problems.

All the strong points and the aspects to be strengthened found in the particular enterprises should be documented in the follow-up sheet. This information will have practical value for the next occasion of follow-up visits. It will also help trainers know the common features of the solutions and problems in the implementing region.

### Activity 3 - Follow-up meetings (optional)

Objectives	Providing the place for discussion of the achievements and ways of implementing relatively difficult improvements.
Duration	3 - 4 hours depending on the number of presenters
Output	Presentation / Interactive discussion
Methods	Direct visits / Workplace walk-through / Interactive discussion
Training Tools	Good example booklet / Action Manuals / Follow-up sheets Low-cost improvement sheets

It is also useful to arrange a follow-up workshop after a few months. The content of this workshop will be determined by the quantity and quality of the progress made in the preceding period. The workshop will therefore be structured using materials drawn from the individual companies. The workshop will play two practical roles: (1) the exchange of achievements; (2) technical assistance for furthering actions.

It would be a great success of WISE trainers if the local people could make all the necessary arrangements for the follow-up workshop within their own initiatives. This is a strong signal that the regional entrepreneurs already have a firm network for continuing their exchanges. In the follow-up meeting, areas where there is potential for future cooperation or sharing of external costs should also be highlighted, for example, in establishing common canteen, recreation, medical or transport facilities.

It is highly likely at all that workers' involvement will be a crucial agenda among the participants of the follow-up meeting. The entrepreneurs who could mobilize the workers' support would be able to develop more improvements easily. This means higher productivity. It is of particular interest to plan some special arrangements for involving their workers' which would be of great help for the companies. The possible ideas may include:

- educational seminars to explain what is being done in the WISE course;
- presentation of the WISE promotional video for workers;
- slide presentations to give examples of good practices;
- task group work for development and implementation of improvements.

The sessions with workers can be organized on company premises and incentives given to those who will attend, by allowing part of the session to take place during working time. Snacks or drinks may also be provided.

#### Activity 4 - Compilation of improvements undertaken

Objectives	Inputting the improvement data into the WISE Database Management System.
Duration	3 - 4 hours depending on the number of improvements
Output	Increased database about the WISE improvement examples
Methods	Inputting the necessary information items
Training Tools	Computers / WISE Database Management System

The WISE Database Management System has opened up a new paradigm in the work of WISE trainers. Now, the trainers can easily access to the abundant information of the improvements in the Philippines and easily obtain the necessary technical assistance. All WISE trainers should train themselves well on the Database Management System. Accessing the System can be done in any regional labor office.

It is the WISE trainers' new important duty to input valuable information on the local improvement examples into the Database Management System. By these efforts, other trainer, entrepreneur or worker can use the same information for progressing his/her actions. Imagine that the information input by a trainer in Davao might assist an entrepreneur in Cebu in implementing his/her action plans. The WISE trainers can also make practical and analytical researches about the types, technical areas, costs and any other aspects of the WISE improvements done in the whole Philippines easily in one sitting.

It would be highly possible that the System will be connected to the international information network in the very near future and will provide tremendously wider information about the low-cost improvement examples not only in the Philippines but also in other countries. It will be assured that the Philippines will be one of the most powerful information sources of WISE improvements. Thanks to the active contribution of WISE trainers.

#### **MODULE 4: OUTLINE OF TRAINING MATERIALS AND THEIR POTENTIAL ROLES**

As the WISE project progresses, various types of related training materials and products have been developed. They are:

- WISE awareness presentation package;
- WISE promotional videos for entrepreneurs and workers;
- The Productivity Performance Assessment System (PPAS) on garments manufacturing, food processing, wood processing and metalworking industries;
- Industry-specific Action Manuals on the garments manufacturing, food processing, wood processing and metalworking industries;
- The WISE Database Management System;
- Action Manual for Workers;
- Environmental protection module;
- Advisory inspection methods.

They are all the fruits of the WISE activities in the Philippines. Application of these WISE products has a large potential for developing unique WISE training courses, responding to the particular needs of the local people in the regions. It is highly recommended that the WISE trainers should utilize these WISE materials for making their training courses more effective and attractive.

WISE materials	Outline of the contents	Potential roles
WISE Awareness Presentation Package	<ul style="list-style-type: none"> <li>- Promotional and information brochure and leaflets;</li> <li>- Locally done low-cost workplace improvement examples booklet;</li> <li>- Flyers for showing technical know-how on the improvements;</li> <li>- Success stories;</li> <li>- Sample programs of comprehensive workshops and awareness courses;</li> <li>- Annual schedule of the WISE training courses in the region.</li> </ul>	<ul style="list-style-type: none"> <li>- For distribution when visiting potential participants during recruitment;</li> <li>- In providing participants of awareness courses further information.</li> </ul>

WISE materials	Outline of the contents	Potential roles
<p>WISE promotional videos for entrepreneurs</p>	<ul style="list-style-type: none"> <li>- The six principles of WISE;</li> <li>- The eight technical areas of WISE;</li> <li>- Potential benefits of WISE courses for local entrepreneurs;</li> <li>- Introduction of success stories about the workplace improvements done by some entrepreneurs who attended WISE courses</li> </ul>	<ul style="list-style-type: none"> <li>- For showing when visiting potential participants for recruitment.</li> <li>- For showing to the participants of the comprehensive workshops or the awareness courses as a part of the training program</li> </ul>
<p>WISE promotional videos for workers</p>	<ul style="list-style-type: none"> <li>- The six principles of WISE;</li> <li>- The eight technical areas of WISE;</li> <li>- Potential benefits of WISE courses for workers and local trade unions;</li> <li>- Success stories about improving working conditions in local enterprises in collaboration with the workers and the owners.</li> </ul>	<ul style="list-style-type: none"> <li>- For showing when visiting potential participants for recruitment in local factories;</li> <li>- In introducing WISE activities to the local trade unions;</li> <li>- For showing to participants of workers awareness courses as a part of the training program.</li> </ul>
<p>The Productivity Performance Assessment System (PPAS) on the garments manufacturing, food processing, wood processing and metalworking industries.</p>	<ul style="list-style-type: none"> <li>- Practical assessment methods of productivity which can be widely applicable in local small enterprises;</li> <li>- Case studies of productivity enhancement and their evaluation by using the PPAS.</li> </ul>	<ul style="list-style-type: none"> <li>- In assisting the local entrepreneurs in identifying potential areas for enhancing their productivity;</li> <li>- In integrating the PPAS application as a part of the comprehensive workshop program.</li> <li>- In evaluating improvement examples done by WISE participants.</li> </ul>

WISE materials	Outline of the contents	Potential roles
<p>Industry-specific Action on garments manufacturing, food processing, wood processing and metal-working industries.</p>	<ul style="list-style-type: none"> <li>- The six principles of WISE;</li> <li>- The eight technical areas of WISE; Action-checklists</li> <li>- which are rearranged for meeting the specific conditions of the garments, manufacturing, food processing, wood processing and metal working industries;</li> <li>- Clear illustrations showing locally available good examples of these industries.</li> </ul>	<ul style="list-style-type: none"> <li>- As training materials Manuals for conducting industry-specific comprehensive workshops or awareness courses;</li> <li>- In providing a guide text for the local entrepreneurs when they voluntarily improve their productivity.</li> </ul>
<p>The Database Management System</p>	<ul style="list-style-type: none"> <li>- The computer database about technical areas, know-how and costs of the improvement examples carried out by WISE methods in the Philippines.</li> </ul>	<ul style="list-style-type: none"> <li>- In providing local entrepreneurs with useful information for implementing workplace improvements;</li> <li>- In upgrading WISE trainers' knowledge and advisory skills for assisting local entrepreneurs in implementing improvements.</li> </ul>
<p>Action Manual for Workers</p>	<ul style="list-style-type: none"> <li>- The six principles of WISE;</li> <li>- The eight technical areas of WISE; An action-checklist which meets the specific needs of workers and local trade unions for improving safety and health at work;</li> <li>- Clear illustrations showing locally available good examples about the improvement of working conditions.</li> </ul>	<ul style="list-style-type: none"> <li>- As a main text when conducting workers' awareness courses;</li> <li>- In introducing the potential benefits of WISE to the workers;</li> <li>- In developing an innovative, comprehensive workshops for workers and local trade unions.</li> </ul>

WISE materials	Outline of the contents	Potential roles
Environmental protection module	<ul style="list-style-type: none"> <li>- The simple technical guides for joint improvements on waste reduction and the improvements on the negative impacts on the workplace and the general environment;</li> <li>- Clear illustrations showing low-cost good examples for environmental protection and waste reduction.</li> </ul>	<ul style="list-style-type: none"> <li>- In integrating into the comprehensive workshops or awareness courses as a part of the programs;</li> <li>- As a practical tool for assisting the local entrepreneurs in practicing environmental protection and cost reduction.</li> </ul>
Advisory inspection methods and suggested inspection form	<ul style="list-style-type: none"> <li>- Checkpoints for identifying the potential improvement points for better working conditions.</li> </ul>	<ul style="list-style-type: none"> <li>- Making labor inspections more advisory and action-oriented;</li> <li>- Linking WISE training courses with labor inspection by motivating the inspected enterprise owners to participate in WISE trainings.</li> </ul>

## MODULE 5: TRAINING MATERIALS

- 1) Workplace Checklist
- 2) Suggested transparency sheets for technical sessions
- 3) Examples of low-cost improvement
- 4) Potential questions and answers
- 5) Action plan forms
- 6) Follow-up result forms

## 1) Workplace Checklist

### How to use the checklist

1. Define the work area to be checked. In the case of a small enterprise, the whole production area can be checked. In the case of a larger enterprise, particular work areas can be defined for separate checking.
2. Read through the checklist and spend a few minutes walking around the work area before starting to check.
3. Read each item carefully. Look for a way to apply the measure. If necessary ask the manager or workers questions. If the measure has already been applied or it is not needed, mark NO under "Do you propose action?" If you think the measure is worthwhile, mark YES. Use the space under REMARKS to put a description of your suggestion or its location.
4. After you have gone through the whole items, look again at the items you have marked YES. Choose a few where the benefits seem likely to be the most important. Mark PRIORITY for these items.
5. Before finishing, make sure that for each item you have marked NO or YES, and that for some items marked YES you have marked PRIORITY.

### Materials storage and handling

1. Clear and mark transport ways.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

- 2 Keep transport ways wide enough and even, with ramps of a small inclination where necessary.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

3. Use carts, hand-trucks, rollers and other wheeled devices when moving materials.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

4. Provide multi-level shelves or storage racks near the work area for tools, raw materials, parts and products.

Do you propose action?

No             Yes             Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

5. Use specially designed pallets or containers of appropriate size to hold and move materials, semi-finished products and products.

Do you propose action?

No             Yes             Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

6. Use mobile storage racks for storing and moving materials, tools and semi-products.

Do you propose action?

No             Yes             Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

7. Use hoists, conveyers or other mechanical means for moving or lifting heavy materials.

Do you propose action?

No             Yes             Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

8. Provide good grips or holding points for all containers and packages.

Do you propose action?

No             Yes             Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

## Machine safety

9. Attach proper guards to dangerous moving parts of machines and power transmission equipment.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

10. Use safety devices which prevent operation of machines while the worker's hands are in danger.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

11. Use mechanical devices or magazines for machine feeding to avoid hazards and increase production.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

12. Attach labels and signs easy to read in order to avoid mistakes.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

13. Make sure machines are well maintained and have no broken or unstable parts.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

14. Make emergency controls clearly visible and easy to reach.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

**Work-stations**

15. Adjust working height for each worker at elbow level or slightly lower than elbow level.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

16. Use foot platforms for small workers and work item holders for tall workers.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

17. Put frequently used tools, controls and materials within easy reach of workers.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

18. Use jigs, clamps, vices or other fixtures to hold items while work is done.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

19. Use hanging tools or conveniently fixed tools for operations repeated at the same place.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

20. Provide a conveniently placed home for each tool.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

21. Change work methods so that the workers can alternate standing and sitting while at work.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

22. Provide chairs or benches of correct height (with the feet comfortably and flatly placed on the floor) with a sturdy back rest.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

### **Lighting**

23. Add skylights and keep skylights and windows clean.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

24. Paint ceilings and walls in light colours and keep them clean.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

25. Provide general artificial lighting adequate for the type of work done, by adding light sources, installing reflectors or re-positioning lamps.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

26. Provide local task-lights for precision and inspection work.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

27. Relocate light sources or work positions or provide shields to eliminate direct glare to workers.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

### **Control of hazard sources**

28. Move the sources of dust, hazardous chemicals, noise or heat out of the workplace.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

29. Install screens, partitions or barriers to reduce the harmful effects of dust, hazardous chemicals, noise or heat by having more openings, windows or open doorways.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

30. Make sure all the containers of hazardous chemicals have labels.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

31. Make sure all organic solvents, paints, glues, etc. are in covered containers.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

32. Clearly indicate each area where the use of personal protective equipment must be observed.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

33. Introduce or improve local exhaust ventilation.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

**Premises**

34. Ensure safe wiring connectors for supplying electricity to equipment and lights.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

35. Improve the heat protection of the building by backing walls or roofs with insulating materials.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

36. Increase natural ventilation by having more openings, windows or open doorways.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

37. Provide enough fire extinguishers within easy reach and be sure that workers know how to use them.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

38. Provide at least two unobstructed ways out of every floor or every big room and make sure that workers know how to evacuate in an emergency.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

### **Welfare facilities**

39. Provide an adequate supply of cool, safe drinking water in all workplaces.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

40. Provide regularly cleaned toilets and washing facilities (with soap) close to the work area.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

41. Provide resting corners and a separate hygienic place for eating meals.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

42. Provide first-aid equipment and train a qualified first-aider.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

### **Work organization**

43. Combine tasks so that each worker can perform varied and interesting work.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

44. Set up a small stock of unfinished products (buffer stock) between different work-stations in order to keep work flow constant while allowing self-paced work.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

45. Rearrange layout and the order of operations to ensure smooth flow of work between different workstations.

Do you propose action?

No       Yes       Priority

Remarks \_\_\_\_\_  
\_\_\_\_\_

## 2) Suggested transparency sheets for technical sessions

### TRANSPARENCY 1

#### MATERIALS STORAGE AND HANDLING

##### *THREE GOALS*

- ✚ Better organized storage
- ✚ Fewer and shorter transport and handling operations
- ✚ Fewer and more efficient heavy lifting operations

### TRANSPARENCY 2

MATERIALS HANDLING DOES NOT ADD VALUE, JUST COST

MANUAL HANDLING CAUSES DAMAGE, FATIGUE AND ACCIDENTS

### TRANSPARENCY 3

#### RULES ON BETTER ORGANIZED STORAGE

- ✚ If in doubt, take it out
- ✚ Avoid placing materials on the floor
- ✚ Save space by introducing multi-level racks
- ✚ Provide a “home” for each tool and work item

### TRANSPARENCY 4

#### RULES ON FEWER AND SHORTER TRANSPORT AND HANDLING OPERATIONS

- ✚ The more you use it, the closer it should be
- ✚ Use mobile storage
- ✚ Make your equipment easy to move to where it is needed

### TRANSPARENCY 5

#### RULES ON FEWER AND MORE EFFICIENT LIFTING

- ✚ Don't lift loads higher than necessary
- ✚ Move materials at working height
- ✚ Make lifting more efficient and safer

## **TRANSPARENCY 6**

### **SUMMARY OF RULES ON MATERIALS STORAGE AND HANDLING**

- ✚ If in doubt, take it out
- ✚ Avoid placing materials on the floor
- ✚ Save space by introducing multi-level racks
- ✚ Provide a “home” for each tool and work item
- ✚ The more you use it, the closer it should be
- ✚ Use mobile storage
- ✚ Make equipment easy to move to where it is needed
- ✚ Don't lift loads higher than necessary
- ✚ Move materials at working height
- ✚ Make lifting more efficient and safer

### **WORK-STATION DESIGN**

- ✚ Keep materials, tools and controls within easy reach
- ✚ Work at elbow height and with enough leg space
- ✚ Use clamps, jigs, vices and other fixtures
- ✚ Make displays and controls easy to see and understand

## **TRANSPARENCY 7**

### **WORK-STATION DESIGN**

Four rules

- ✚ Keep materials, tools and controls within easy reach
- ✚ Work at elbow height and with enough leg space
- ✚ Use clamps, jigs, vices and other fixtures
- ✚ Make displays and controls easy to see and understand

## **TRANSPARENCY 8**

### **IDEAS FOR BETTER WORK-STATION DESIGN**

- ✚ How to increase productivity by changing the position of tools and materials
- ✚ How to redesign a work height and chair to increase product quality
- ✚ How to avoid wasted effort using simple fixing device
- ✚ How to locate dials and controls to minimize mistakes

## **TRANSPARENCY 9**

### **RULES ON EASY REACH**

- ✚ Keep materials, tools and controls within easy reach

## **TRANSPARENCY 10**

### **RULES ON WORK POSTURES 1**

- ✚ Change work-surface height or positions of work-items, tools or controls so that the work is done at elbow height
- ✚ Provide a stable, non-wobbling work-surface on which work items can be firmly placed
- ✚ Use platforms so that the short workers can be at the proper height

## **TRANSPARENCY 11**

### **RULES ON WORK POSTURES 2**

- ✚ Place materials, tools, and controls where they can be reached easily by the worker without bending or twisting the body
- ✚ Provide good chairs of correct seat height and with a good backrest
- ✚ Provide enough leg space to allow easy leg movement

## **TRANSPARENCY 12**

### **RULES ON USE FIXTURES**

- ✚ Use clamps, jigs, levers and other devices to save time and efforts

## **TRANSPARENCY 13**

### **RULES ON DISPLAY AND CONTROLS**

- ✚ Improve displays and controls to minimize mistakes
- ✚ Make mutually related dials and controls grouped together
- ✚ Make clearly identifiable control
- ✚ Use different shapes or colors for different kinds of switches or signals
- ✚ Label dials and switches clearly what operation is meant
- ✚ Make the emergency switch easily visible

## **TRANSPARENCY 14**

### **SUMMARY FOR WORK-STATION RULES**

- ✚ Keep materials, tools and controls within easy reach
- ✚ Improve work posture for greater efficiency

## **TRANSPARENCY 15**

### **PRODUCTIVE MACHINE SAFETY**

- ✚ How to increase productivity by a simple feeder
- ✚ How to select reliable machine guards which do not reduce efficiency
- ✚ How to increase workers' safety consciousness
- ✚ Why the use of personal protective equipment should be a very last resort

**TRANSPARENCY 16**  
**RULES ON SAFE FEEDING**

- ✚ Use feeding and ejection devices to increase productivity and reduce machine hazards

**TRANSPARENCY 17**  
**RULE ON MACHINE GUARDS**

- ✚ Use the right type of guard

**TRANSPARENCY 18**  
**PRODUCTIVE MACHINE SAFETY**

- ✚ Always in this order:
- ✚ Eliminate the hazards; or
- ✚ install guards; or
- ✚ as a last resort, use personal protective equipment

**TRANSPARENCY 19**  
**SUMMARY FOR MACHINE SAFETY RULES**

- ✚ Use feeding and ejection devices to increase productivity and reduce machine hazards
- ✚ Use the right type of guard
- ✚ Maintain machines properly
- ✚ Eliminate the hazards; or install guards, or as a last resort use personal protective equipment
- ✚ Maintain machines properly

**TRANSPARENCY 20**  
**CONTROL OF HAZARDOUS SUBSTANCES**

- ✚ How to replace expensive solvents by other chemicals
- ✚ How to improve local ventilation without increasing electricity consumption
- ✚ How to reduce loss of chemicals and save energy

**TRANSPARENCY 21**  
**RULE ON SUBSTITUTING CHEMICALS**

- ✚ Replace a dangerous substance with a less dangerous one

**TRANSPARENCY 22**  
**RULES ON USING COVERS AND ISOLATING HAZARDOUS SOURCES**

- ✚ Use lids, covers, maintenance and isolation of process to control hazards and reduce losses
- ✚ Save energy used to overheat chemicals

**TRANSPARENCY 23**  
**RULES ON COST-EFFECTIVE VENTILATION**

- ✚ Use natural air flow to reduce air contamination
- ✚ Clean properly-don't spread dust
- ✚ Use fans properly
- ✚ Use push and pull ventilation
- ✚ Use personal protective equipment as a last resort

**TRANSPARENCY 24**  
**SUMMARY FOR RULES OF CONTROL OF HAZARDOUS SUBSTANCES**

- ✚ Replace a dangerous substance with less dangerous one
- ✚ Use lids, covers, maintenance and isolation of process to control hazards and reduce losses
- ✚ Save energy used to overheat chemicals
- ✚ Use natural air flow to reduce air contamination
- ✚ Clean properly-don't spread dust
- ✚ Make local ventilation cost-effective
- ✚ Use personal protective equipment as a resort
- ✚ Don't eat or bring home dangerous substances

**TRANSPARENCY 25**  
**LIGHTING**

- ✚ How to reduce your electricity bill by using natural light
- ✚ How to get better lighting out of your existing features
- ✚ How to raise productivity and quality by using local lighting and avoiding glare
- ✚ How to lighting maintain and save your money

**TRANSPARENCY 26**  
**RULE ON USE OF DAYLIGHT**

- ✚ Make full use of daylight

**TRANSPARENCY 27**  
**RULES ON AVOIDING GLARE**

- ✚ Using blinds, curtains, louvers, shades, and trees
- ✚ Changing windows to translucent ones
- ✚ Changing the position of light sources or work-stations
- ✚ Deep shades or shades low enough to ensure that light bulbs or bright surfaces are outside the normal field of view
- ✚ Matt surfaces without reflected glare

## **TRANSPARENCY 28**

### **RULES ON REPOSITIONING OF LIGHTS AND LOCAL LIGHTS**

- ✚ Find the right place for light sources
- ✚ Distinguish an object from its background
- ✚ Reveal its surface texture
- ✚ Reveal its shape
- ✚ Enable any marking on its surface to be seen easily

## **TRANSPARENCY 29**

### **RULES ON AVOIDING SHADOWS**

- ✚ More and cleaner windows and skylights
- ✚ Light-coloured, matt-surfaced ceilings, walls and equipment
- ✚ Layout which avoids shadow zones
- ✚ Group of lights for group of machines
- ✚ Use reflected light to avoid glare
- ✚ Avoiding isolated pools of bright light
- ✚ Better light direction

## **TRANSPARENCY 30**

### **SUMMARY FOR RULES FOR BETTER LIGHTING WITHOUT AN INCREASE IN THE ELECTRICITY BILL**

- ✚ Make full use of daylight
- ✚ Avoid glare
- ✚ Choose an appropriate visual task background
- ✚ Find the right place for light sources
- ✚ Avoid shadows
- ✚ Ensure regular maintenance

## **TRANSPARENCY 31**

### **WELFARE FACILITIES**

- ✚ How to reduce fatigue and maintain health of your workers by providing facilities meeting their needs
- ✚ How to be ready for emergencies
- ✚ How to make sure that rest means recovery
- ✚ How to attract and retain the best workers

## **TRANSPARENCY 32**

### **RULE ON UPGRADING THE MOST BASIC FACILITIES**

Make sure essential facilities serve their purpose

- ✚ Drinking water
  - Water bags or bottles
  - Drinking water containers
  - Drinking fountains
- ✚ Sanitary facilities
  - Toilets
  - Wash-basins

**TRANSPARENCY 33**  
**RULES ON FIRST-AIDS**

- ✚ Be ready for emergencies
- ✚ Sterile bandages, pressure bandages, dressings and slings
- ✚ Cotton wool for cleaning wounds
- ✚ Scissors, tweezers and safety pins
- ✚ An eye bath and eye wash bottle
- ✚ Ready-to-use antiseptic solution and cream
- ✚ Simple over-the-counter medicines such as aspirin and antacids
- ✚ A booklet or leaflet giving advice on first-aid treatment

**TRANSPARENCY 34**  
**RULE ON REST AREAS**

- ✚ Make sure that rest means recovery

**TRANSPARENCY 35**  
**RULE ON ATTRACTIVE LOW-COST FACILITIES**

- Use low -cost facilities to attract and retain workers
- ✚ Work clothes
- ✚ Locker and changing rooms
- ✚ Eating areas
- ✚ Canteens
- ✚ Health services
- ✚ Transport facilities
- ✚ Recreational facilities
- ✚ Child-care facilities
- ✚ Factory day

**TRANSPARENCY 36**  
**SUMMARY FOR RULES FOR WORK-RELATED WELFARE FACILITIES**

- ✚ Make sure essential facilities serve their purpose
- ✚ Be ready for emergencies
- ✚ Make sure that rest means recovery
- ✚ Use low -cost facilities to attract and retain workers

**TRANSPARENCY 37**  
**PREMISES**

How to make low-cost improvements in your factory such as:

- ✚ Temperature control;
- ✚ Better ventilation;
- ✚ Properly designed floors and layout;
- ✚ Fire and electrical safety

**TRANSPARENCY 38**  
**RULE ON PROTECTION FROM HEAT**

- Protect your factory from outside heat and cold
- ✚ Let nature help you
- ✚ Improve the heat reflection of the walls and roof
- ✚ Improve heat insulation
- ✚ Use shades to protect against heat from the sun

**TRANSPARENCY 39**  
**RULES ON NATURAL VENTILATION**

- ✚ Let natural air-flow improve ventilation
- ✚ Make better use of horizontal air-flow
- ✚ Utilize the tendency of hot-air to rise

**TRANSPARENCY 40**  
**RULE ON POLLUTION SOURCES**

- ✚ Eliminate or isolate sources of pollution

**TRANSPARENCY 41**  
**RULES ON FLEXIBILITY AND ADAPTABILITY INTO PLANT LAYOUT**

- ✚ Reserve free space in the work area
- ✚ Allocate sufficient passageways and make sure that they are kept clean
- ✚ Avoid the use of rail-type floor transportation systems
- ✚ Use production equipment and storage facilities
- ✚ Provide evenly distributed general lighting and supply lines throughout the production area

**TRANSPARENCY 42**  
**RULES ON PREVENTING FIRES**

- ✚ Ensure that electrical circuits are enclosed, insulated, earthed and properly fused
- ✚ Lubricate properly the moving parts of machines
- ✚ Keep combustible and flammable materials well away from hot surfaces and open flames
- ✚ Store flammable liquids in appropriate containers away from heat sources
- ✚ Dispose of oily used rags in airtight containers

### **TRANSPARENCY 43**

#### **RULES ON PREVENTING ELECTRICAL HAZARDS**

- ✚ Any repair or maintenance work on machines should only be done when the power is off and the switch is locked in the OFF position
- ✚ Be sure that all electrical wiring is identified and protected
- ✚ All circuits should be protected with circuit breakers or fuses
- ✚ All equipment should be earthed
- ✚ Portable tools and equipment should be double insulated and earthed
- ✚ Be certain that electrical power can be shut off immediately in case of emergency

### **TRANSPARENCY 44**

#### **SUMMARY FOR RULES ON PREMISES**

- ✚ Protect your factory from outside heat and cold
- ✚ Let natural air-flow improve ventilation
- ✚ Eliminate or isolate sources of pollution
- ✚ Improve your floor
- ✚ Build flexibility and adaptability into plant layout
- ✚ Prevent fires and electrical accidents

### **TRANSPARENCY 45**

#### **WORK ORGANIZATION**

The most essential elements of working conditions and the working environment that provide a basis for productive work.

### **TRANSPARENCY 46**

#### **GET RID OF EXTRA TASKS AND OPERATIONS**

- ✚ Introduce changes into the design of the products
- ✚ Switch to new production methods
- ✚ Perform a number of tasks in one operation by using special multi-tasks tools or machines
- ✚ Machine several parts in one operation

### **TRANSPARENCY 47**

#### **DEFEAT MONOTONY TO KEEP WORKERS ALERT AND PRODUCTIVE**

- ✚ Frequent changes in tasks
- ✚ Opportunities to walk around or change from sitting to standing or standing to sitting
- ✚ Frequent, short breaks
- ✚ Opportunities to communicate with other workers or listen to music without leaving their work-station

## **TRANSPARENCY 48**

### **INSTALL BUFFER STOCKS TO MAKE THE WORK FLOW SMOOTHLY**

In designing buffers one should try to:

- ✚ Minimize the floor space taken up by the buffer
- ✚ Ensure easy maintenance, transport and replacement
- ✚ Choose the appropriate height for the buffer and design it to minimize the effort needed
- ✚ to put stock in or take it out
- ✚ Store work-pieces in a systematic manner so you can get an exact idea at a glance of what is available

## **TRANSPARENCY 49**

### **DESIGN RESPONSIBLE, FLEXIBLE JOBS**

- ✚ Jobs should make clear who is responsible for output and quality
- ✚ Jobs should help workers to develop skills and become interchangeable
- ✚ Jobs should occupy each worker fully but should remain within each workers capacity

## **TRANSPARENCY 50**

### **SET UP AUTONOMOUS GROUPS TO IMPROVE EFFICIENCY AND TO CUT SUPERVISORY COSTS**

Group work arrangements have several advantages:

- ✚ It is much easier, and less time-consuming
- ✚ The work flows more smoothly, and less supervision is needed
- ✚ It takes less time for new workers to learn a skill
- ✚ Continuous co-operation between the workers help them to spot mistakes more promptly

## **TRANSPARENCY 51**

### **MAKE THE ORGANIZATION OF PRODUCTION FIT YOUR BUSINESS OBJECTIVES**

- ✚ Set up one simple, preferably straight line flow of materials for each product or family of products
- ✚ Let everyone concerned not only with the quality of his or her own operation but with the total quality of the products
- ✚ Keep constant and rapid feedback between the customer or dealer and everyone engaged in production
- ✚ Provide individual reward not only on performance of a given task but on attaining a common final goal

## **TRANSPARENCY 52**

### **SUMMARY FOR RULES FOR EFFECTIVE ORGANIZATION OF WORK**

- ✚ Get rid of extra tasks and operations
- ✚ Defeat monotony to keep workers alert and productive
- ✚ Install buffers to make the work flow smoothly
- ✚ Design responsible, flexible jobs
- ✚ Set up autonomous groups to improve
- ✚ Make the organization of production fit your business objectives

## **TRANSPARENCY 53**

### **RULES ON INSTALLING BUFFER STOCKS TO MAKE THE WORK FLOW SMOOTHLY**

- ✚ Minimize the floor space taken up by the buffer
- ✚ Ensure easy maintenance, transport and replacement
- ✚ Choose the appropriate height for the buffer and design it to minimize the effort needed to put in stock or take out stock
- ✚ Store work-pieces in a systematic manner so you can get an exact idea at a glance of what is available