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Good housekeeping practices

programme design and application in industry

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INTRODUCTION

The Plan's Regional Activity Centre for Cleaner Production (RAC/CP) of the Mediterranean Action set up the carrying out of the *Guide for Designing and Implementing a Programme of Good Housekeeping Practices in Mediterranean Industries* with the main aim of providing Mediterranean industrialists and experts with some basic criteria and methodology to implement a Programme of Good Housekeeping Practices adapted to the situation, priorities and possibilities of their own company.

The relationship between the industries and the environment has been subject to evolution, and nowadays the prevention approach provides the most benefits and opportunities, both environmentally and economically, often at low or no investment cost by applying good housekeeping practices. The latter involves improving organisation, management, and mostly operational habits, and therefore adopting pollution prevention and ecoefficiency criteria in decision-making is essential.

In order to present a structured and organised scheme for designing and implementing a Programme of Good Housekeeping Practices, the guide we present is divided into five chapters and final conclusions.

The first chapter provides an introductory framework of reference to the cultural change as regards introducing environmental criteria in decision-making and presents a brief overview of the main environmental considerations related to industrial activities.

The second chapter introduces the concept of a Good Housekeeping Practices' Programme and emphasises the importance of a proactive approach to the same while carrying out decision-making. Each company should establish its own objectives when setting up the Programme, which should be realistic and achievable, and revise the same periodically in order to adapt it to the company's evolving needs and respond to the principle of continuous improvement in its quality field.

The third chapter presents the strategies and key responsible persons and elements to implement a Programme of Good Housekeeping Practices.

The fourth chapter explains step by step the implementation process of a Programme of Good Housekeeping Practices, and provides methodological information on how to answer the following questions: what is the company's initial situation (processes, facilities, customers, staff, etc)?, which environmental goodhousekeeping practices should my company choose?, how should the training programme be constituted to implement the previously identified good housekeeping practices?, how to evaluate the results of the Good Housekeeping Practices Programme?

Once the basic criteria and methodology to implement a Programme of Good Housekeeping Practices has been presented, the fifth chapter answers the question that comes next: what can my company do after the latter has been already implemented?, and thus presents other instruments to further adapt the company's processes and products to the present environmental demands and thus obtain further benefits, both environmental and economic.

An additional annex describes in greater detail the tools required to set up the various steps of the implementation process. The annex will be especially useful for those companies that want to carry out a more elaborate implementation of the specified recommendations that appear in the fourth chapter of the guide.

The Good Housekeeping Practices Programme can be integrated within the general training programme of the company and further strategies leading towards the implementation of environmental management systems and other instruments aimed at adding value to the company's products and processes.

CHAPTER I: BEFORE STARTING, ONE NEEDS TO KNOW…

1.1 Environment and Industry: Continual Joint Improvement and the Integration of Environmental Considerations

Maybe people are not aware of it but an important change is going on in man's perception of his surroundings and the environment. Once it is been realised and accepted on a collective basis that human activity directly affect the natural environment (climate, landscape, resources, biological balance, etc.) in a deterministic way, new ways of interacting with the environment can be introduced. All of a sudden, the environment and the activities being carried out there are viewed in a totally different light. The outcome of this new perception is that the way in which many things and habits are done is being modified. This is an important step forward. Once man has assimilated this new way of perceiving his surroundings, he can adopt a new scale of values and from then onwards, his perception, appraisal and actions all change to fit in and agree with the new reality.

The reader is probably wondering: What are they talking about? It's quite simple. Not so long ago - some people even today still have this view of things - it was thought that waste water was liquid that disappeared down the drain; smoke was gas and particles that would go up the chimney and disappear into the air where everything got absorbed; solid waste was a mass of useless things or rejects from manufacturing activities and a lorry would come and take it all away and make it disappear. This way of viewing things is fortunately undergoing a change these days and people now talk of the future sustainability of man's natural surroundings. Just think of waste water full of pollutants being discharged into rivers and the sea, the fumes being belched out into the same air that you have to breathe or the solid waste being thrown anywhere with no consideration for the pollution of aquifers, the atmosphere, the soil or the deterioration of the natural surroundings. A change has occurred in our perception.

This new perception generates new requirements in industry, which need responding to efficiently. First of all, these new requirements that have arisen because of the environment have often been perceived as new obligations that have had to be dealt with in an urgent way. On a second level, they need to be considered as opportunities for the future that may be extremely interesting if ways to make adequate use of them

can be found. On this second level, an in-depth re-examination of the efficiency and cost of the solutions that have already been implemented to protect the environment is also necessary, for they are often irrational and costly in the majority of cases.

It's time for an overall change to be made in the approaches that have been used up until the present. It's time for creative solutions to be developed and implemented that respect the environment without using up scarce resources. It's time for creative solutions that reduce and, in many cases avoid waste flows that need to be processed, stored or destroyed via costly methods and which don't always totally respect the environment. Some of these actions include:

a) Use is made of higher quantities of many materials than that which is strictly necessary. Waste flows get generated for no motive or with no justification
b) It is feasible to substitute certain raw materials for others which as less polluting
c) Materials that have been purchased arrive in unnecessary wrapping or packaging material, which could be done away with,
d) Products put on the market carry quantities of wrapping or packaging materials which are unnecessary for their end purpose;
e) Certain industrial operations and practices generate considerable amounts of waste flows that are avoidable
f) Good use could be made of some waste flows that are generated
g) Etc

One fundamental element in the efficient management of industrial activities is the design and implementation of a Good Housekeeping Practices' Programme. The implementation of one means:

- Making good use of and integrating the company's human resources in a suitable way in relation to the environment.
- Reducing the costs of waste flow treatment and elimination
- Reducing the amount of waste flows generated.
- Increasing the levels of safety in relation to the protection of the environment

Or, in other words, making the efficient management of industrial activities the norm in relation to the environment.

This manual seeks to introduce and help you, the reader, to design and implement a Good Housekeeping Practices' Programme (GHP Programme) that can serve as an aid in the good environmental management of your industrial activities. Without the implementation of appropriate Good Housekeeping Practices, it is clearly impossible for industrial activities to be appropriately managed in relation to the environment.

1.2. A review of the aspects of industry that affect (or interact with) the environment

The main focuses of industrial pollution are well established and are the key to understanding the relationship of a company with the environment. It is proposed that you think how your company relates to the environment in terms of the following, and if the relationship affects it little, a lot or not at all.

1.2.1. Use of resources

Whenever a natural resource is used, the environment is undoubtedly affected. Given that many resources are limited (water, oil, wood, landscape, species, etc.), the use of these sources may compromise their availability in the future.

1.2.2. Wastewater

All industrial activities use water from the public water supply or from private catchment areas that ends up being poured directly or from a treatment plant into water courses or the sea. Elements in wastewater that are not found in the original water, or in quantities that are inferior, are pollutants that can affect the environment and need to be eliminated or reduced to a level that is at least below the maximum values permitted according to legislation before being returned to the water cycle. An increase in the temperature of wastewater must also be considered environmental pollution, for the temperature affects the biological balance of the receptor medium.

1.2.3. Air pollution

Emitting elements that are harmful or a nuisance (particles in suspension, solvents, organic compost in general, flue gases, etc.) into the air damages the environment both nearby (people living nearby are affected by low concentrations of substances that may cause odours, dust, etc.) and a long way away (acid rain, thinning of the ozone layer, etc.).

These emissions are often in the form of substances, but they can also be in the form of radiation (nuclear, X-rays, light, noise, vibrations, etc.).

1.2.4. Industrial waste

Eliminated industrial waste has traditionally affected the environment in such a way that has resulted in its accumulation on landfill dumpsites or incineration. There are now more and more alternatives that favour prevention at source and valuation (acquire value through another use) and this new perspective is just beginning now. A small amount of effort at the place where waste is generated can often bring about an important benefit for the environment, while in other cases this same benefit can be achieved just by putting some effort into merely classifying.

1.2.5. Dumping on the land and underground

The voluntary or accidental dumping or filtration of any type of substance into the soil or underground where industry is located can causes these to be polluted. Apart from being very difficult to eliminate, if this were to be considered appropriate, there is also the very high risk of aquifers that flow beneath these areas being polluted and problems occurring in the quality of groundwater.

1.2.6. Manufactured products

The voluntary or accidental presence of pollutants in manufactured products can cause contamination of the environment if an accident occurs when the product is used or when it is eliminated in the form of waste.

CHAPTER II: GOOD HOUSEKEEPING PRACTICES

2.1. Good housekeeping practices (GHPs): a way to improve the environmental behaviour of industry

The processes and practices involved with supplying products and services to clients have evolved in a spectacular way during recent years. This has been because of the development of more and more powerful technologies that have multiplied process efficiency over and over again. Despite the availability of new tools, however, the determining factors of this change have always been the same: market opportunities and the ease of operation.

A direct consequence of the greater responsibility towards the environment is that the determining factor of environmental impact, or how man's practices affect the environment, has entered into the scheme of industrial progress. Good Housekeeping Practices are environmental practices that are better than the present ones or better than the most common ones. Good Housekeeping Practices (GHPs) are the whole group of personal and collective habits that lead to correct environmental management as the result of each individual's actions in an organisation. Here we start coming to the principle of overall sustainability and, with that, the individual sustainability of the company itself.

GHPs are not actions that are just done exclusively within the scope of industry. There are also examples that can be applied at home. Throwing a fluorescent tube into the garbage is common practice every time a fluorescent lamp goes, for example. Given the toxicity of the depleted fluorescent substances inside the tube, the corresponding GHP would be to store the fluorescent lamp and dispose of it in the appropriate place and time.

2.1.1. Synergy between Good Manufacturing Practices and Good Housekeeping Practices

As a result of all that has been said so far, one could think that undertaking processes in industry according to Good Housekeeping Practices would means an increase in current costs and a reduction in the quality of the product or service provided.

To reflect on this, imagine two stores locations, one with clean aisles, all the material perfectly classified, the packaging/containers intact, no spills on the ground, etc., and another one in complete disorder where the situation is the opposite. Just think for a moment how many incidents would occur in each one (loss of materials, delays in deliveries, soiled packaging delivered to the client, spills, out-of-date products, etc.). Then, imagine what the impact would be on the company's profit and loss statement and on the environment in both cases. Savings in costs, a better quality service to the client (Good Manufacturing Practice) and the reduction in both waste and resources used in manufacturing the products and that in turn become waste (Good Housekeeping Practice) all result from making conscious efforts to maintain order in the stores location.

Efforts to preserve the environment result in improvements in quality and they also bring about the reduction in costs. Thinking for a moment on the two ideas that are proposed further on in this chapter shows how justified this statement is.

2.1.2. The GHPs: a personal issue

Environmental technology and services in general that are available to industry often provide solutions that are more respectful of the environment, while investment in environmental improvements is frequent made in many companies. Who finally decides, however, on the amount of water to be used in cleaning the floor, and who actually does selective collection?

GHPs go beyond just mere investment for they gravitate around **the person** and, as a tool, aim at achieving respect for the environment as the result of the decisions of everybody in the company.

2.1.3. Examples

Following are some examples of the results obtained through the application of Good Housekeeping Practices:

- A Company decided to select and store the packaging material that its raw materials arrived in. The material (sold or returned to the supplier) now generates

a substantial monthly income. Within 10 months, the company got back the investment made in the sorting equipment and in adapting the storage area.

- A Company in the foodstuff sector decided to selectively collect all of the scrap being generated in the maintenance operations. Now, when it has gathered sufficient volume together, the scrap is sold and an economic fund for the workers, which has been set up with the income from this, serves as an incentive to segregate waste.
- A Company in the foodstuff sector was using hoses with a flow volume of 60 litres/minute for 4 minutes in the operation to wash out the process tanks. By using a high pressure cleaning system, the volume of water was reduced to 15 litres/minute while the increased efficiency also reduced the necessary cleaning time. As a result, there was a saving of between 180 to 200 litres in each rinsing operation. The implementation of this system meant an important economic saving for the company.

2.1.4. What GHPs does my industry need?

A rough and simple way of answering this question is to use your intuition in identifying what practices would improve the environmental impact of the industry that you are involved in. It is very useful to read publications on GHP and Cleaner Production for this helps the intuitive process. Common sense then helps to distinguish the GHPs that are most appropriate.

As a more precise answer to which GHPs are appropriate for your industry, the initial premise is that the overall impact of your industry is the consequence of each small impact of all of the operations that are carried out.

The first step, then, is to identify each of the operations that uses up resources or that generates waste flows. Once these are identified, you need to ask the following questions:

- Can the waste flow that is being generated be eliminated?
- Can changes be made in the process so that a less aggressive one, in terms of the environment, can be generated?
- Can it be reduced in quantity or volume?

- Can it be segregated in such a way that recovery is made easier?
- Can it be reused in the same process or in another one in the industry?

Once the environmental management of the operation in question has been optimised on paper from the answers to each of these questions, the following question needs to be asked: What influence does the behaviour of the workers have on the good environmental management selected for the industrial operation in question? If the answer is that the workers have no influence on the efficiency of the magnitude of pollution of the operation, it would only be necessary to implement the actions agreed on. If not, and if the workers are not appropriately trained (implement Good Housekeeping Practices), the efficiency of the management being implemented will be highly jeopardised, if not doomed to failure.

2.1.5. Prior experience

As an example, the following is a series of Good Housekeeping Practices from a pilot project carried out in different sectors of industry in Catalonia and that were considered by all concerned to be of general interest.

- **Communication**: Good Housekeeping Practices consist mainly of considering and assessing the effect of any decision or action on the generation of waste, wastewater and emissions. It is thus important for everybody in the company to work together and to share the information necessary for carrying out their usual tasks and thus contribute to the overall objective of prevention.
- **Established procedures:** Establishing written procedures for doing things and their compliance on the part of the work force can help to save raw materials, avoid the generation of products that don't comply with specifications, minimise the risk of accidents and prevent pollution from being generated.
- **Cleaning:** Efficient cleaning processes save resources and cleaning agents, and prevent the generation of waste, waste water and emissions.
- **Tool and installation upkeep:** Equipment suffers from wear due to intensive use. The careful use of a preventative maintenance programme can minimise wear and its consequences. The goal is to prevent breakdowns before they cause losses in

production or before pollution is generated.

- **Everything in its place:** Everything in its place and a place for everything. The different operations in an industry often need to be done in areas with specific conditions and equipment to minimise the risk to the environment.
- **Turn off and clean up:** The occurrence of leakages and spills is relatively frequent in most companies. Turning off and cleaning up enables pollution to be reduced, it helps in the valuation of spilt products and it minimises the need for water and/or cleaning products. Overall, it means the reduction in the volume and pollutional load of the wastewater generated.
- **Water and electricity use:** A light on for no reason or a stopcock badly closed means that resources get wasted while waste and emissions get produced. A Company that is aware of this fact can prevent pollution from being generated and achieve important economic savings.
- **The stores location and its maintenance:** A well-managed, orderly stores location reduces the generation of waste and therefore reduces the cost associated with waste elimination.
- **Handling and transportation:** By observing the necessary precautions in the handling, transportation and transfer or decanting of products, leakages, spills or other emissions can be avoided and pollution and the environmental cost of the company reduced.
- **Waste segregation:** Waste segregation facilitates minimisation, it enables the most appropriate treatment to be given to each piece of waste, and it increases valuation fractions and reduces the economic costs associated with management.

CHAPTER III: PUTTING GOOD HOUSEKEEPING PRACTICES INTO PRACTICE

3.1. Introduction to Good Housekeeping Practices' Programmes

The way to put GHPs into practice in industry is through Good Housekeeping Practices' Programmes, which provide specific solutions to the need for improving a company's environmental behaviour.

Through the application of a set programme, a specific GHP gets put into practice:

- So that everybody involved in a process is aware of its impact on both the local environment and the environment as a whole, and
- By presenting how they should carry it out in order for its impact to be reduced to a minimum, given the tools available for achieving this.

Having got to this point, it should be mentioned that a Good Housekeeping Practice may be attainable or maybe not, for in principle it is only an idea. A GHP Programme, however, must above all be attainable and it therefore has to take into account what the existing means and resources are and start out from the current level of environmental awareness in the company. If the first programme is a failure, it is going to be very difficult to propose another one.

3.1.1. Crossing the bridge when you come to it

The method described below for carrying out a Good Housekeeping Practices' Programme consists of four basic stages that are called TIMES. Musicians and music lovers know the importance of following the rhythm or of keeping time. In the right type of environmental management, Good Housekeeping Practices' Programmes continue one after the other in time, just as in music, so that the processes done in the company can be carried out in harmony with the surroundings.

The TIMES that are proposed here are as follows:

- TIME 1. Knowledge of the current situation of each area of the company in relation to the environment

- TIME 2. Identify all of the possible good housekeeping practices and select which GHPs are to be implemented and where
- TIME 3. Specifically communicate the GHPs to everybody and to all the homogenous groups in the company and have them all trained in them
- TIME 4. Assessment of the results of the GHP Programme

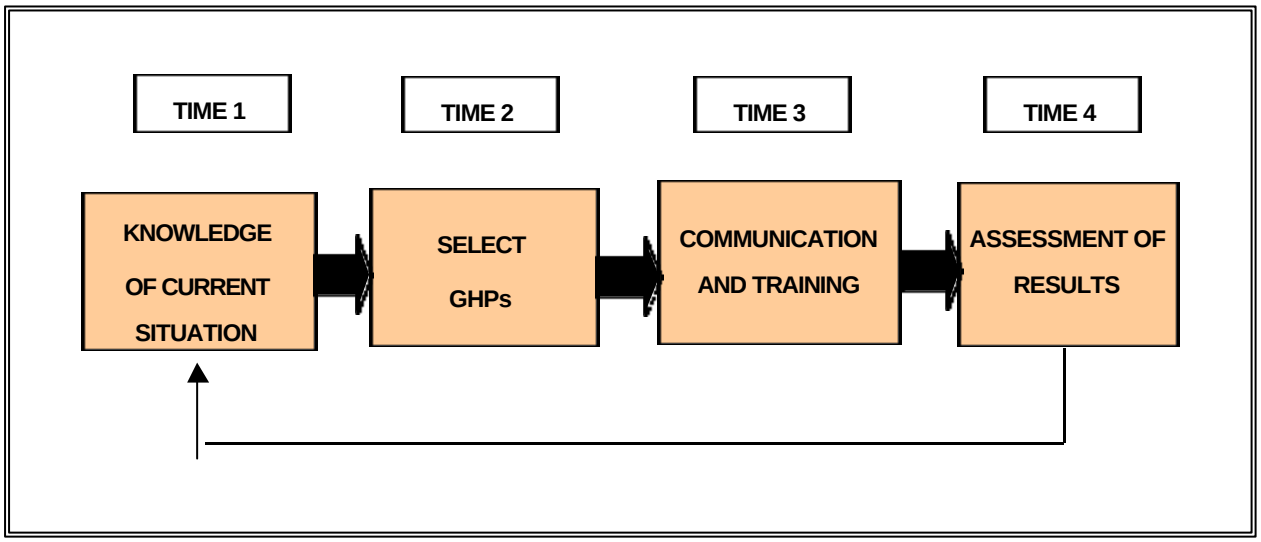


Figure 3.1. The TIMES that make up a Good Housekeeping Practices' Programme

3.1.2. Two strategies for putting GHPs into practice

A Good Housekeeping Practices' Programme can be planned simply by using one's intuition and common sense or in a more complex way by using management tools.

Given the heterogeneity of the companies that this manual is aimed at, two parallel strategies for putting into practice a Good Housekeeping Practices' Programme are proposed:

- A basic one that is simple and direct, and
- An advanced one that requires more effort but that also helps to make decisions because it provides more data.

Each company has to decide which strategy is more appropriate or if the use of some intermediary point between the two would be more suitable. The most important thing, however, is that the Programme adopted is the most efficient, that is, that the means that it uses are proportional to the goal and, above all, that they guarantee the success of the project.

The steps for completing the basic strategy are summarised in the flowchart appearing as figure 3.2. and are explained in the next chapter.

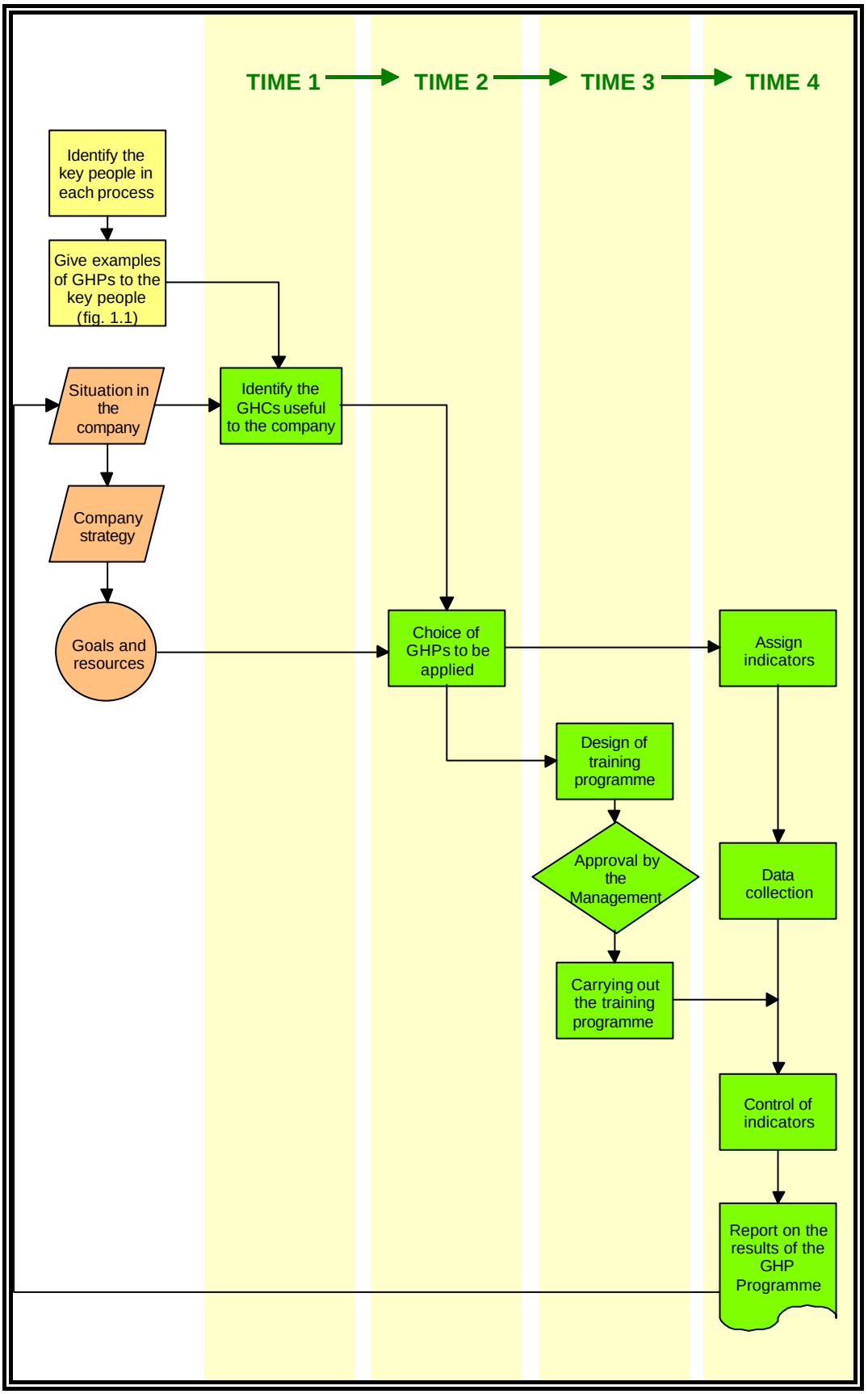


Figure 3.2. Basic strategy for applying a GHP Programme

The actions for completing the advanced strategy are explained in more detail in the next chapter, and include tools in appendix 1 that complete the process explained and forms in appendix 2 that can be used directly.

3.2. Key elements in a GHP programme

Following is a description of some of the key elements that can help make a GHP Programme to be a success.

3.2.1. The role of the management

According to its function as leader of the company, the Management plays a fundamental role in the effective implementation of a Good Housekeeping Practices' programme.

It has to take on and carry out the following tasks:

a) Define the environmental policy of the company
b) Define the functions, authority and responsibilities of each person involved in relation to environmental management (and in particular the GHP Programme)
c) Resolve any possible conflicts that may arise due to differences of opinion
d) Lead the Programme: by congratulating when goals are achieved and making decisions when the Programme is not fulfilled.

Without the decisive and active participation of the Management of the company, any action aimed at introducing any new knowledge, such as Good Housekeeping Practices, is condemned to failure.

The management must at all times assume its function of leader by orientating and directing efforts in the appropriate direction. The definition of an environmental policy and its dissemination amongst the personnel is one of the most effective ways of carrying out this task.

Even so, it will be difficult for each of the necessary functions to get carried out if these have not been clearly assigned to an particular person and, at the same time, if this person:

a) Is not clear on the responsibilities and authority delegated in him/her
b) Does not have the appropriate knowledge and ability for the task with which he/she has been entrusted; and
c) Does not have the freedom no the necessary means for carrying out the functions;

A Good Housekeeping Practices' programme is fundamentally a programme for changing the mentality of the people who work in the company. A considerable number of these will accordingly oppose any type of change (like the phenomenon of inertia that opposes movement in a physical system that is at rest). The actions and attitude of the Management will be fundamental in overcoming this inertia. It will need to make very clear what the direction mapped out is in its declaration of principles (Environmental Policy), and this is done basically with the support of the decisions made on a daily basis.

3.2.2. The right choice of Good Housekeeping Practices to be implemented

The right choice of Good Housekeeping Practices to be implemented is fundamental in their being a success or a failure. In this selection, the GHPP Co-ordinator should get everybody that is responsible for the processes that are affected to take part, and also take into account the opinion of all of those involved together with the information they provide.

In principle, when making the choice, one should:

1. Identify the critical points where the main waste flows or waste of resources occur as a result of the existence of practices that are not friendly to the environment.
2. Listen to the opinion of everybody involved to discover any possible GHP that could enable improvements to be made in the current situation (it's important that none of the ideas that are generated get thrown out).
3. Get those in charge of the affected areas to be familiar with and accept the GHPs that have been chosen to be applied in their areas.

The definitive choice of the GHPs out of all of those under consideration is made by the GHPP Co-ordinator through attention being paid to:

- The quantitative importance of each GHP (that it has a greater effect on the more important impacts),
- The psychological importance of each GHP (that it's seen to be important for the majority of the people), and
- The resources assigned by the Management.

An excessively ambitious Programme that is not fulfilled may jeopardise other programmes in the future. It is important therefore to choose just a few Good Practices but to choose them well. Everybody (management, process controllers, workers and trainers) will be much more satisfied if practical results are evident.

3.2.3. Training and appropriately informing the entire work force

Once the process controllers have decided which Good Housekeeping Practices are to be considered, it is a serious error to think that the people who will have to carry them out:

1. Are familiar with them
2. Know what their purpose is; and
3. Are aware of the consequences of carrying them correctly

According to the degree to which this is not so, it will be necessary to establish and carry out a training and communication programme that informs everybody involved:

1. In a clear and precise way what the Good Housekeeping Practices to be adopted are
2. What the results of each of the Good Housekeeping Practices will be
3. What the consequences for the environment will be if the established Good Housekeeping Practices are not fulfilled.

A group that is especially important in terms of training, and about which special mention needs is required, are the process controllers (heads of department, charge-

hands, etc.). They control the day-to-day organisation of the work in their corresponding areas, together with the practical training of the people for which they are responsible.

3.2.4. Relying on the help of outside experts

People working in companies and in society in general have never had so little time, while companies have never had so much and so varied information. These two facts often mean that there is literally no time to convert this information into knowledge and even more often, there is a shortage of time for putting knowledge into practice.

When the issues don't initially have to do with the market or costs, it's even more difficult to find time. Everyone is concerned about the environment but being realistic means that other preoccupations take preference over environmental ones.

On the other hand, the effort in terms of time that an organisation has to make when carrying out a GHP Programme is concentrated basically in a period of two or three months and falls mainly on the GHPP Co-ordinator and, to a lesser degree, those in charge of processes (process controllers).

The help of an external specialist in the company can benefit the GHP Programme in terms of:

- Time-saving for the company's own personnel;
- A similar or greater efficiency of the project, given the specialist's experience;
- The guarantee that projected time limits will be complied with
- A new, objective point of view for the company;
- Technical resources for giving the training sessions.

Relying on the help of an outside specialist does not have to mean that the company stops controlling the project; the results will be more effective if it is the company itself that knows what it wants and makes its own decisions, notwithstanding the fact that it has listened to the opinion of the expert. When we talk about GHPs, we are talking about people and not machines, and it can be difficult to perceive the real character of the people in an organisation when seen from the outside.

External specialists took part in the pilot campaign that is explained further on, and the results were assessed as being satisfactory by the different companies and sectors that took part.

3.3. Good housekeeping practices' programme: the performers

Carrying on with the musical comparison, performing or giving specific form to a Programme requires qualified musicians who perform skilfully and accurately interpret the different parts in the established time signature. In some cases, the performers will be soloists who are usually in charge and are defined as such within the company. On other occasions, the Management of the company will have to choose the most appropriate people for each case.

These performers have already been identified. It is important then to know what their characteristics are and what role they have to play in the GHPs.

Before beginning the Good Housekeeping Practices' programme, it is important to know who the directors, controllers and workers are in each process, as well as deciding who will have to take on the role of co-ordinator and trainer. In many cases, there will obviously not be a role for each person while in others; somebody may have to play more than one role. In this case, the important thing is to use the right instrument at the right time, above all, to be 'in time', and 'in tune'.

3.3.1. The management

In the majority of companies, this role will be assumed by the managing director, the manager, the management committee, or in general any person who has the resources and authority in a specific field.

The management Rulebooks State that the Management has to lay down the policies to be followed and the goals to be attained in the different strategic areas and, above all, assign the necessary resources that are available. Within the terms of reference of the subject at hand, it is no different; there is only the added difficulty of the change in corporate culture that the management itself has to experience. It is thus important for the management to understand the environmental challenge facing the company.

Point 2.1. In this chapter gives an in-depth description of the guidelines to be followed by this performer.

3.3.2. The Co-ordinator of the GHPP

This will be a person designated by the management. In principle, it is better for the person not to be employed full-time in this role.

This person will have the functions of presenting the project and of its overall co-ordination. His/her task will basically be to have an overall view of the relationship of the company with the environment, mark out the priorities and inform everybody in the organisation of the results of the project, especially the Management and the Key Group.

This performer will need to have good knowledge of:

a) The personnel,
b) The processes used in the industry,
c) The different sources of pollution and the techniques of prevention and reduction,
d) The current situation in relation to the protection of the natural environment, and
e) Good Housekeeping Practices.

It is important that the GHPP Co-ordinator has the sufficient authority for guaranteeing the success of the Programme and that he/she believes in the need for the GHPs.

One function that already exists within the company and that may possibly correspond with this role is that of the person in charge of Quality Control. In small companies, this performer could be the Director or Manager him/herself.

In the previous cases, the help of an external advisor who is an expert in the particular sector and also in the environment may be advisable.

This performer adjusts the overall rhythm of the Programme according to the interpreting ability of each of the performers. He/she will have to inform the

Management of the main difficulties, if there are any, preventing the Good Housekeeping Practices' programme from progressing as anticipated.

3.3.3. Key Group

It would be recommendable for the GHPP Co-ordinator, or the Director, to form a workgroup with the key individuals who have, as a whole, knowledge of the current situation in all the areas of the company.

The functions of this key group are:

- As a source of information for the situation of the company in relation to the environment,
- To spread the awareness of Good Practices and communicate aspects of the GHPP within its area of influence.

It is not at all necessary for the people in this group to have any direct authority over an area in the company. What is important, however, is that they have the necessary time to be able to participate in the meetings of the workgroup. Apart from the GHPP Co-ordinator, some of the people who are in charge that should form part of this are the Head of Human Resources, the Head of Maintenance and the Heads of the different areas of production.

The ideal size for the group should be as small as possible provided that it has access to all of the necessary information (from one to six people at the maximum).

This team may be unnecessary in the case of very small companies.

3.3.4. The Trainers

These will be in charge of conveying the principles and methods of the Good Practices and the Programme. They may be people from any area in the company who have the ability to communicate, or outside specialists (which is the recommended option, wherever possible).

In the case of in-house personnel:

- They will have the ability to communicate,

- They will be highly thought of by the personnel to be trained,
- They will be familiar with, or trained in, techniques of communication,
- They will know the scope needed for the training or, lacking this, they will be capable of assimilating it easily within a reasonable period of time

For the training of management and heads/controllers, collaboration with an outside specialist is recommended.

In the case of outside specialists:

- They should be chosen according to their experience in communication and training in Good Housekeeping Practices or, failing this, in training in industrial matters (safety at work, quality, etc.).
- It is recommended that they are familiar with the industrial sector that the company belongs to and able to identify the Good Housekeeping Practices that are considered to be the easiest.
- They should have good communication skills and/or be familiar with techniques of communication.

It is important to emphasise that this performer's skill in communicating is a key element, because it is not a question of just winning someone over but of really convincing them. Guidelines to help those who have little experience in this are given in chapter 4 of this manual (TIME 3) and in appendix 1.

3.3.5. Process controllers

This role corresponds to the heads of department and those in charge of lines in the company.

This performer manages the resources assigned by the Management (people and equipment) in a particular area for carrying out a process in order to achieve the goals established by the Management (costs, quantities, quality, etc.). The Process Controllers define on a day-to-day basis the specific criteria for the process to be carried out by the workers and will therefore be the key performer for making sure that what is specified today continues to be done tomorrow.

Before choosing any specific Good Practice, it is very important to get the opinion of the Process Controller. This will probably be the person who knows most about the feasibility of putting it into practice, and if he/she is not convinced about it, the adoption of the Good Practice is bound to fail.

3.3.6. Process workers

These are all of the people who carry out operations in processes where GHPs are to be applied (workers, analysts, office workers, etc.). This is the most important performer for getting GHPs to work.

The results of the Programme depend on the conviction and skill of the process worker. This is why his/her abilities (knowledge and practice) must be taken into account at all times for the Programme to be in harmony with them.

A real case is explained to make the importance of involving the workers really clear.

The Head of maintenance in a company, who was concerned about the excessive use of water, decided to put a fast-closing stop-cock on the end of the cleaning hoses in the production area. He made the decision after observing that the workers were leaving the hoses running so as not to waste any time. You can imagine his surprise when the following month he found out that somebody - of course no-one owned up to it - had cut off the taps that had been fitted on the end of the hoses, because this wasn't as 'convenient' as having the water running continuously.

3.4. Pilot campaign: a positive experience

The Ministry of the Environment of the Autonomous Government of Catalonia promoted a pilot campaign for carrying out a GHP Programme in different sectors of industry in Catalonia during 1998 and 1999, with the intention of establishing the bases for a general campaign.

The overall evaluation of the experience was highly positive for different reasons, including:

a) The project was well accepted by all the groups from industry (directors, bosses, charge-hands, workers, and unions) despite some initial reticence due to the lack of knowledge about the goals of the campaign.
b) The results that were obtained were positive in relation to the resources that were used.
c) A definite level of synergy exists between the implementation of a System of Environmental Management and the Good Housekeeping Practices' Programme.

The experience was also beneficial for detecting problems and trying out possible solutions. These include:

a) Prior presentation of the aims of the GHP Programme has to be made to all of the directors and the different committees (workers, safety and health and quality control) in the company.
b) The situation in every company is different to any other and thus each one requires a specific GHP Programme that is adapted to its situation and needs.
c) When the GHPs are carried out, the performance of a particular operation may go down, despite the overall increase in efficiency in the organisation. Precautions must thus be taken in production planning, because demands that are impossible may put the fulfilment of the GHP at risk.
d) The support of an outside specialist can be useful in facilitating the decision-making process and the preparation of training activities.

The conclusions of the pilot campaign appear in table 3.1 where an overview is given of both the strong and weak points that were detected, the opportunities that are provided and the hazards that may arise during the implementation of a Good Housekeeping Practices' programme.

STRONG POINTS	**WEAK POINTS**
• It makes use of and integrates the company's human resources in relation to the environment.	• It doesn't necessarily give the workers the technology that is most respectful of the environment.

• It does not involve an important investment in terms of time or money. • How ambitious a project is (economic resources and time) depends on the company itself. • It reduces the costs of treatment and of eliminating waste flows. • It reduces the quantity of waste flows generated and of resources used. • It increases safety in the plant in relation to environmental protection. • It improves in-house communication.	
OPPORTUNITIES • It establishes the systematic for satisfying the requirements for the formation of an Environmental Management System. • It improves the work environment. • It provides the opportunity of bringing in an outside specialist who provides a new perspective of the environmental management of the company.	**HAZARDS** • Incoherence between the day-to-day decisions made by the management or those in charge and the directives of the Programme. • Arguments between those in charge and the workers. • The company's lack of experience and knowledge in terms of the environment and training.

Table 3.1. The strong points, weak points, opportunities and hazards of implementing a GHP Programme

CHAPTER IV: A GHP PROGRAMME, TIME AFTER TIME

4.1. TIME 1. Know the current situation of the company

A CASE HISTORY

Taking care of the environment was fundamental for the company, but the Management didn't know it

Here is the case of a company specialising in the manufacture of cakes and confectionery products. The Management began an important promotion campaign for its products. It employed the necessary resources to carry out market research; prepare marketing plans; create an appropriate distribution and merchandising network; contract a publicity campaign, etc. Everything was going perfectly, with sales even exceeding what was anticipated due to favourable market circumstances.

In TIME 1,

The aim is…

To know the fulls facts about the industry in terms of the environment (suppliers, processes, installations, clients, workers, owner, people living nearby and legislation) and to identify which GHPs are useful according to the current situation of the company.

Then two articles about the company appeared in the press. One of them gave a list of products including one of those of the company in question that had to do with inappropriate dumping that was harmful to the environment. The article went on to say that the disposed products could be exploited in a much better way and that it was a problem both for the environment and in the management of limited natural resources. The second article explained that the people who were living near to the factory had started a series of protest actions aimed at eliminating the unpleasant smells being emitted from the plant's oven chimneys - the smell of baked cakes all day long didn't make the neighbours at all happy, on top of which the situation was made fun of by their friends when these would come to visit. The protest

actions also referred to the nuisance caused by the noise of the industrial installations.

The Management of the company was greatly surprised by the news of the dumping. It had absolutely no idea of the final destiny of the factory's waste, nor of the annual volume or what the nature of the waste was. While the problems related with the people living in the vicinity had reached the notice of the Management, the company believed that the people were wrong. In any case, when they had all moved into the area, the factory had already been there for years and had always made the same noise and given off the same smells.

Coinciding with the publication of these two articles, the sales of the company's products begun to drop.

A careful study of the real causes of the decline showed that consumers didn't want to buy products of a brand which was involved in problems of noise and smells, nor from a company that wasted natural resources and that polluted the environment.

The Management had to accept this. The new situation clearly showed that customers not only want to buy good products but that they also demand that these are produced in a way that is friendly to the environment.

The Management was faced with a new problem. The company had perfectly good control over matters concerning the purchase of raw materials, production, merchandising and human resources, but it was totally ignorant of its situation in relation with the environment.

This story illustrates one of the basic principles of management: that one can make a mistake when making decisions (it's impossible to be 100% right) but you can't brandish disregard for the reality of a situation. The implementing of a GHP Programme may be considered necessary or not but a company cannot be allowed to not know the reality of its situation in relation to the environment in the whole scope of its activities (suppliers, processes, installations, clients, workers, ownership, people living nearby and legislation).

Concerning the GHPs, the information on the reality of the situation of a company is not normally found in a report or library. This information is found more or less widely distributed in the knowledge of the different people in charge in the company.

Before beginning the TIMES of a GHP Programme, the first job for the Management or the GHPP Co-ordinator is to identify the people who know about the real situation of the company and to bring them together as a group. This group, which is identified as the Key Group, should be as small as possible provided that access can be given to all the information (from one to six people, at the maximum).

Before handling the project, it is necessary for this Key Group to get trained in the significance of the GHPs and for it to receive information on other different GHPs (the 10 GHPs in chapter 3 are an example). The training of this Group could be the job of the GHPP Co-ordinator or of an outside specialist.

The first resolution that this Group must make is the convenience or not of starting a GHPP, given the current situation of the company. In the case that its implementation is considered appropriate, it then needs to handle the Programme and the GHPs that, in principle, are to be applied within its area of influence.

4.1.1. Basic strategy

Once the decision has been made to start the GHPP, the Key Group identifies the GHPs that it considers most useful for the company.

Identifying the GHPs can be done at a meeting of the Group led by the GHPP Co-ordinator. Before the meeting, the GHPP Co-ordinator clearly explains the aim of the meeting to those present and, as preparation, he/she asks each of them to gather information about their particular area related with the environment.

In the actual meeting, brainstorming (appendix 1) can be used to identify the GHPs (T1 T5). In order to direct the meeting in an even more effective way, the different processes in the company from the receipt of raw material through to the dispatching of the finished product can be brainstormed.

Once all of the ideas about the possible GHPs are down on paper, their effectiveness is checked according to the benefits that they can contribute to the company's environmental management. The assessment of the stage to which these benefits can be achieved will be the indicator of the effectiveness of implementing the GHP Programme.

The result of this meeting will be a list of the possible GHPs, together with the benefits that will be obtained in the case that each of them is put into practice.

Process	GHP	Projected benefits
A	1 A	
	2 A	
	3 A	
B	1 B	
	2 B	
C	1 C	
D	1 D	

Where:

- A, B, C, D, etc. are processes, and
- 1,2,3 are the possible GHPs for each of the processes

4.1.2. Advanced strategy

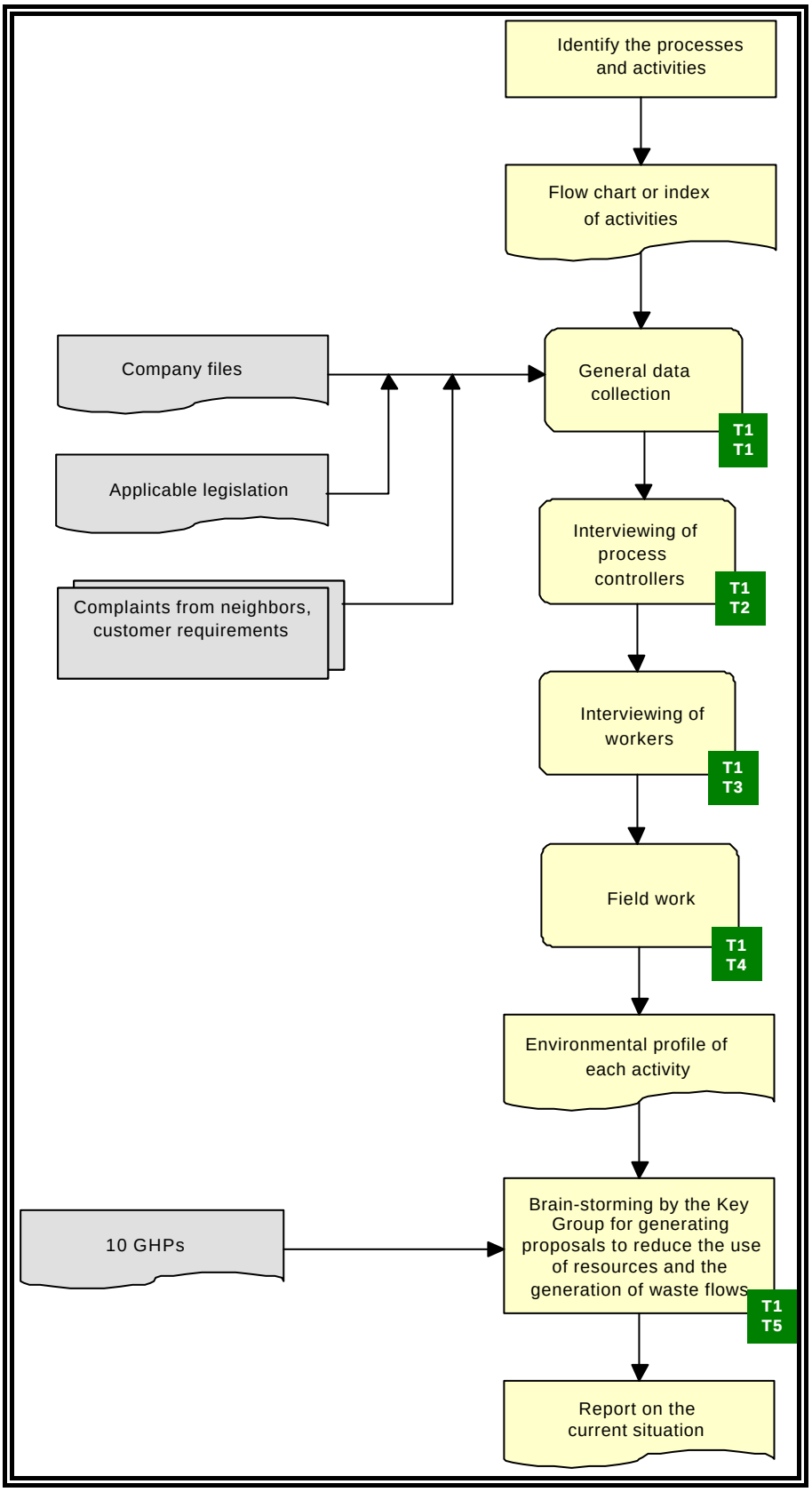


Figure 4.1. Advanced strategy for TIME 1

The general data information and the knowledge of the GHPP Co-ordinator, together with the support of the key group will serve as the basis for preparing a flow-chart that includes all of the processes and their operations carried out in the company.

The diagram should be laid out so that all of the processes and operations and, more particularly, those that involve the use of natural resources or that generate waste flows, are identified. In the case of operations that are not included in any specific process (cleaning, maintenance, insect fumigation, etc.), these can be grouped in a section for general operations (see figure 4.2).

The environmental profile of each operation is prepared using the diagram and the data from the interviews with the process controllers, workers and the fieldwork that has been collected and checked.

Once the environmental profiles of all of the operations have been completed, one or several meetings with the Key Group are organised to compile ideas for improving the environmental management of the industry.

The environmental profile record is then completed by using the results from these brainstorming sessions, with the knowledge of the Key Group and the proposals for reducing the environmental impact of each operation (see form T1F0).

All of these data finally appear in the report, which shows the situation of the company in relation to the environment. As well as the data already mentioned, it is advisable for the report to describe the environmental culture of the people working in the company and the awareness of all of those who may be affected by the company's environmental management activities (interested parties).

One type of structure for the report is as follows:

1. A quantified summary of the different ways in which the company has an impact on the air, water, soil, noise and waste;
2. A diagram or diagrams where the main processes of the company are described;
3. Environmental profile records with proposals for improvement

4. An assessment of the environmental culture in the different groups and departments;
5. An assessment of the current and future environmental requirements of parties concerned in or affected by the company (customers, owner, people living nearby, the authorities, suppliers, etc.).

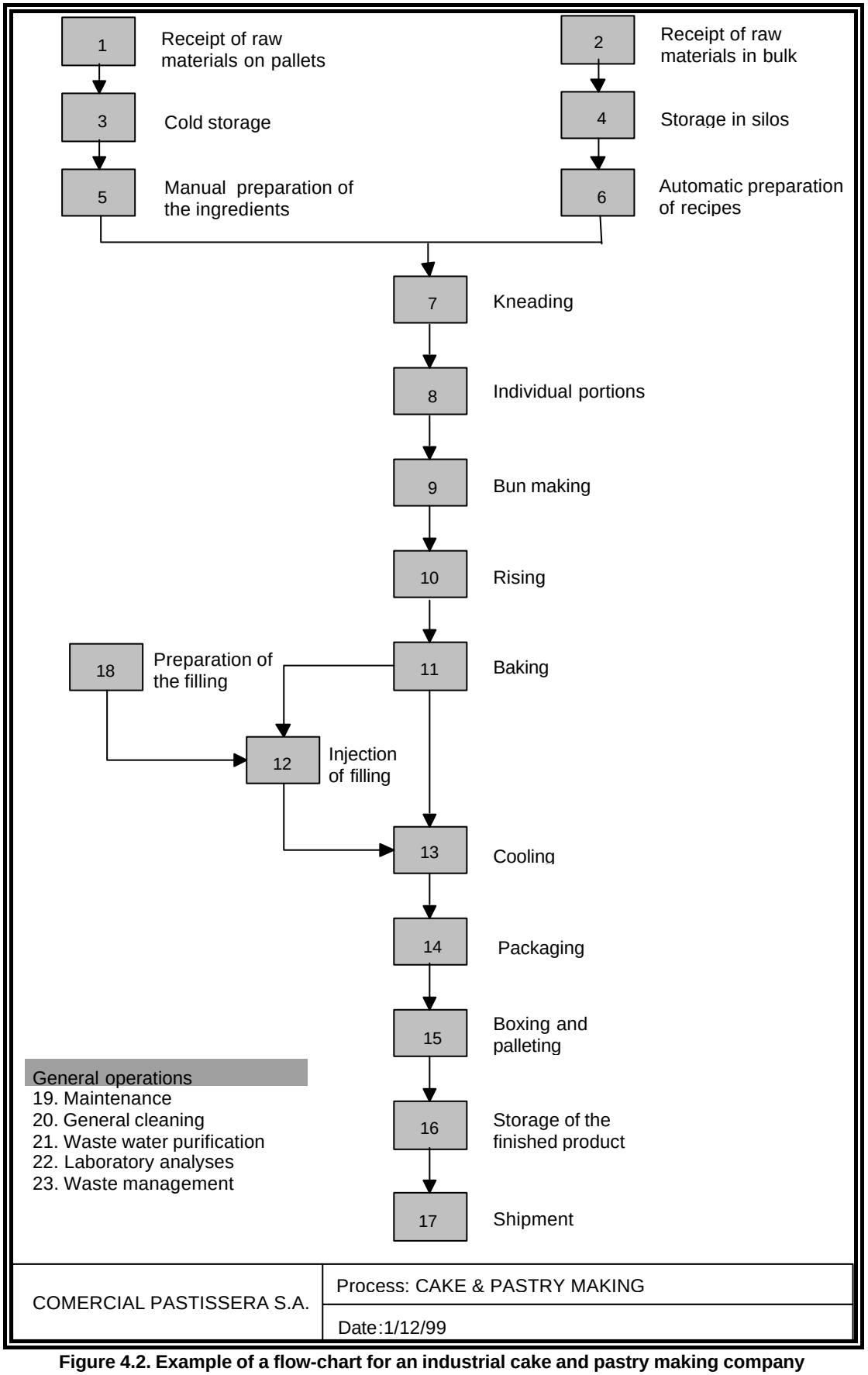


Figure 4.2. Example of a flow-chart for an industrial cake and pastry making company

4.2. TIME 2. Select which good Housekeeping Practices (GHPs) to apply

A CASE HISTORY

The workers didn't know that the Environment was as important as Production

The Management of a company specialising in toy production had designed a General Plan for the Protection of the Environment, with the object of reducing production costs, of protecting and improving the company's corporate image and to comply with the current regulations. One part of the Plan anticipated the selective separation of solid waste. Another aspect dealt with the collection of machine lubricants by making sure that none of these ended up in the wastewater or solid waste. A third aspect was the recycling of office paper to produce a conglomerate that formed part of a new toy that had been recently designed.

In TIME 2,

The aim is…

Select out of all of the GHPs that have been identified those that are most appropriate for being applied in the GHP Programme in progress in accordance with the determining factors of the industry itself (awareness of the parties involved and resources).

The person in charge of Quality Control found out, practically at the same time, of two high-cost nonconformities. The first was that one of companies collecting the cardboard had made an important economic claim because the last twenty five ton batch of cardboard collected was highly contaminated with mineral oil. This had caused serious damage to its cardboard recovery process and so the company was making a claim of a large quantity of money for breach of contract and they were also threatening with legal action. The second nonconformity was that the head of quality control had detected the presence of a large quantity of mercury in the new toy that incorporated the office paper conglomerate. As a result, all of the toys had to be withdrawn from the market.

The person in charge of waste complained that the level of solid waste segregation was much lower than anticipated, and that the small quantity of waste in the selective

waste containers was not very well separated and that it was practically the same kind of waste as in the ordinary waste containers.

" I don't understand", said the person in charge of waste, "the workers have got containers for all different types of waste. They're labelled perfectly well. The factory is full of signs that remind people of the importance of waste selection. But it seems that no one is taking any notice of them".

The people in charge of quality and waste met together with the Director of the company to talk about the situation created by the nonconformity and the low level of solid waste segregation. They also took advantage to talk about the low level of compliance of the current Plan. After a lot of talk on the question, the person in charge of waste said, "The problem is that the workers don't want to collaborate in the prepared Plan. If we don't force them to do more, there's no way of solving it".

The head of quality control replied, " It's not a question of just winning them over but of really convincing them. If we analyse it, most of the workers are probably unaware of the importance of the Plan being implemented; they probably think that it's just something extra and that the really important thing, which they've always been told, is to increase productivity".

The Director said, "I don't understand. With the money that each of these incidents has cost us and our employees persisting in refusing to collaborate with the Plan…"

The person in charge of quality control ventured to ask, "Do you think that the workers know about the data that we have and of the damage caused by the non-fulfilment of our Environmental Protection Plan?

The Director answered by saying: "Maybe you're right. What's needed is a Training Programme to be designed and given to the workers on this subject".

The person in charge of quality control added, "If you want, I know a method for implementing Good Housekeeping Practices that I think is just what we need".

4.2.1. Basic strategy

Starting with the list of GHPs identified in the company, the GHPP Co-ordinator estimates the investment and the increase in costs that will be necessary for applying each of them. This valuation assessment should be as accurate as possible. With these data, the GHPP Co-ordinator prepares a list of GHPs in order of priority.

Let's take, for example, a chemical company where the Key Group has identified the following Good Housekeeping Practice:

"Fix any small vapour and non-hazardous substance leak in piping within a week, at the maximum, from the time when any worker in the plant informs of one",

Which is an improvement on the current system that consists of a *quarterly monitoring of leaks.*

After making some consultations, the GHPP Co-ordinator of the company estimates that 10% of the monthly wastage statistics is due to leakages. By consulting the person in charge of maintenance, he finds out that 50 small leaks are repaired on average every quarter.

These are the data that he will use to fill out the list of GHPs in order of priority:

Priority	GHP	Benefits	Investment	Increase in costs
1	Fix any small vapour and non-hazardous substance leak in piping within a week, at the maximum, from the time when any worker in the plant informs of one	• Energy saving • Avoid 10% of monthly wastage • Cleaner installations • Reduction in the emissions of volatile organic compounds	0	20%

The GHPP Co-ordinator presents the list of GHPs to the Management. The Management then defines which are the GHPs that it considers appropriate to apply in accordance with its policy. If the strategy of the Management of the chemical

company in the example had to do with costs, it wouldn't agree with the implementation of the priority 1 GHP. On the other hand, if the strategy was to keep the installations clean in order to receive visits, the benefits resulting from the implementation of this Good Housekeeping Practice could help the decision to be made.

The choice of the most appropriate GHPs would most ideally be decided on at a joint meeting of the Key Group with the participation of the Management, and by realistic decisions being made in terms of the GHPs that are to be implemented. The principles for making an appropriate choice are developed in more detail in tool T2 T1 in appendix 1.

Once the GHPs have been chosen, then comes the moment of defining the indicators to be used for assessing the results in TIME 4 and for moving to TIME 3.

4.2.2. Advanced strategy

In contrast to the basic strategy, the advanced strategy is based on permanently establishing a General Plan for the Protection of the Environment**.** This Plan enables the company to plan and carry out a series of actions aimed at protecting the environment and also organises the whole group of actions, installations and controls that are established for achieving specific environmental goals.

In accordance with this concept, the GHPs are not an entity in themselves but depend on some established goals.

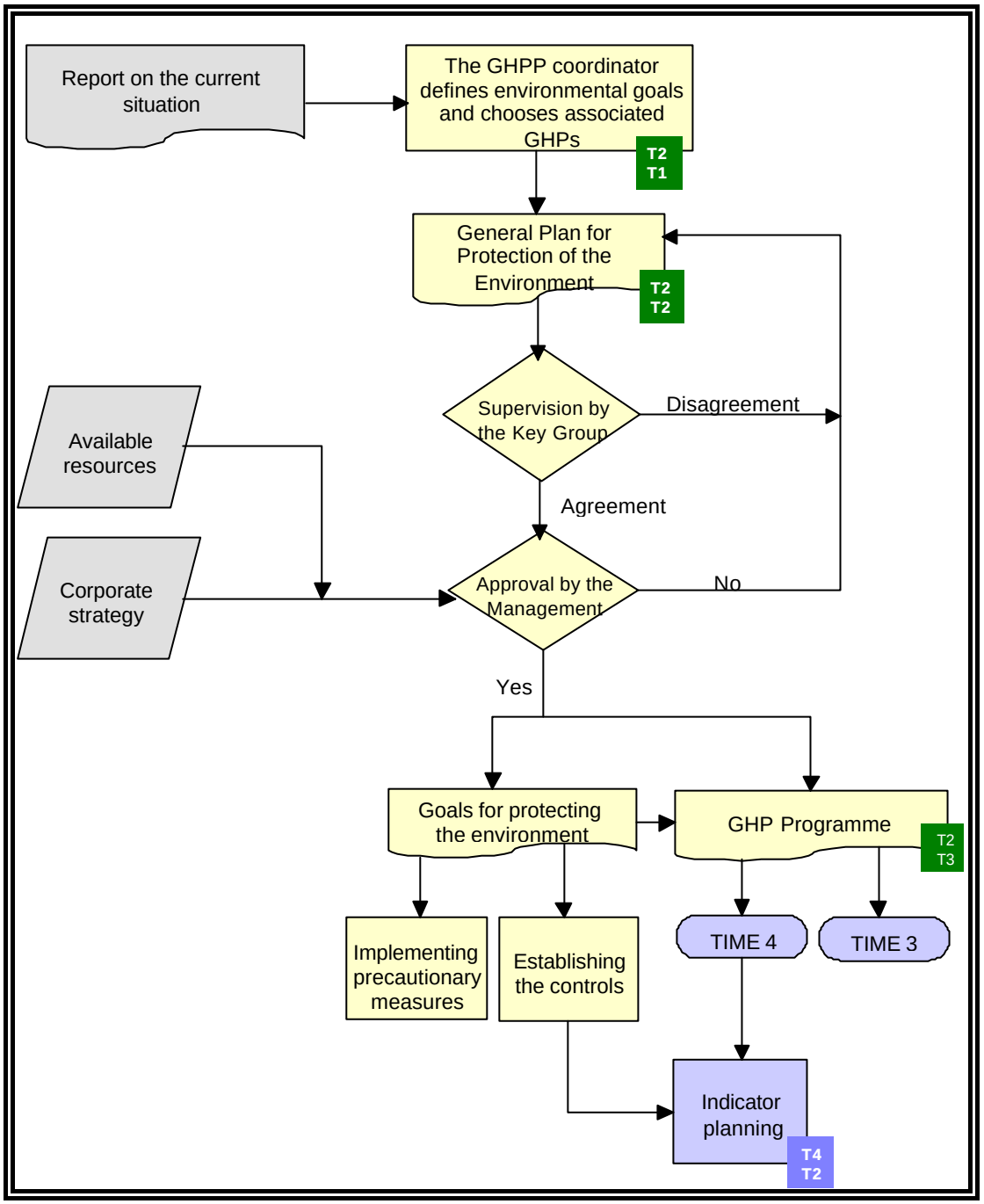


Figure 4.3. Advanced strategy of TIME 2

4.2.2.1. The General Plan for the Protection of the Environment

Starting with the knowledge of the real situation, the GHPP Co-ordinator designs a General Plan for the Protection of the Environment that must be checked by the Key Group and approved by the Management. This lays down all of the actions, controls

and corrective measures that need to be applied to ensure that the environmental goals are achieved. The Plan in question is based on a definition of the values for the levels to be attained (in terms of both the generation of waste flows and the use of resources) for each operation in the different processes.

One way of expressing the goals of the Plan is in the form of a diagram, where all of the operations that make up the different processes are represented, and where the reference values for each operation are associated. In appendix 1, the tool T2 gives an example of this kind of presentation, where the goals for the operations that are considered critical are marked out in a special way.

The Plan should at least contain the following elements:

- A diagram of all of the industrial operations carried out, in both production as well as general ones (maintenance, cleaning, refrigeration, heating, process water conditioning, etc.).
- The identification of critical operations that generate or can generate waste or environmental pollution and for which an environmental goal has been assigned.
- For each critical operation, the following must be documented:

    a) The anticipated goals for resource use and for the elimination, reduction and/or recycling of waste flows
    b) The actions that will needed to eliminate or reduce the environmental impact below the level fixed by the goal for the operation in question
    c) Who the person-in-charge is for carrying out these actions
    d) The necessary control checks for ensuring that the environmental impact does not exceed the levels set in the goal
    e) Who the person-in-charge is for carrying out the control checks
    f) If the case warrants, where will the results of the control checks be recorded;
    g) What the established limits are for each of the control checks made
    h) What corrective actions need to be undertaken when the results of the control checks exceed the maximum permitted
    i) Who the person-in-charge is for adopting the corrective measures
    j) Where will the corrective measures decided on in each case be recorded.

4.2.2.2. Supervision of the General Plan for the Protection of the Environment and the selection of GHPs to be applied

Starting from the preliminary draft proposed by the GHPP Co-ordinator, the Key Group will have to supervise the feasibility of the Plan.

For each of the operations identified in the previous point, the Key Group will have to decide whether:

- The culture,
- The level of training,
- The available records,
- The available resources and means,
- And the motivation of the personnel,

Are adequate for reducing the environmental impact below the levels established for the operation in question.

If any of the five points is not sufficient for ensuring the goal that has been set, the corrective measures will need to be adopted so that any shortcoming can be overcome. If the point in question is one of the first three, the corrective measures will be in the form of Good Housekeeping Practices; in the case of the last two, they will take the form of investment or an increase in costs.

Having reached this point, Good Housekeeping Practices (GHPs) can be defined as:

Appropriate corrective measures so that every person in the company has the right cultural awareness and has received suitable training and instruction to ensure the effectiveness of all of the critical operations involved in a General Plan for the Protection of the Environment.

So, for example,

- If a shortcoming is related to the level of cultural awareness of the workers and process controllers in relation to the environment, the kinds of inappropriate mentality that have been identified need to be precisely defined (the workers involved in the reactor operation don't realise the importance of preventing the thermal oil leaks from going down the drain and the environmental problem that this creates), together with the solution that is being proposed (specific training needs to be designed to eliminate this shortcoming).
- If the shortcoming has to do with the appropriate training of the workers that carry out a specific operation, the kind of lack of training identified needs to be precisely defined (the workers that do the cleaning process don't know how to stop the cleaning fluids from going down the drains, instead of in the recovery bin), together with the solution that is being proposed (specific training needs to be designed to ensure the correct handling of the installation when being cleaned by the workers).
- If the shortcoming has to do with clearly instructing the workers so that they are reminded how to act, the kind of shortcoming that has been identified needs to be precisely defined (there is no instruction available for the workers reminding them of how to stop the vent installation so that it minimises the number of reject products. This means that the installation sometimes gets stopped in an incorrect way), together with the solution that is being proposed (put clear and visible instructions next to the installation control panel on how to stop it).
- This is also a good time to point out the existing shortcomings in terms of the means available to the workers (although the workers in the packing plant have the right cultural mentality, training and instructions for separating empty or broken glass containers for recovery, there is no specific container to put the glass to be recovered in), together with the solution that is being proposed (install appropriately labelled containers near the workers in the packing area that are for the specific purpose of collecting glass for recycling).
- This is also a good time to point out the shortcomings that may exist in terms of motivation (although the workers in the ingredients weighing area have the right cultural mentality, training and appropriate instructions for cleaning out as much as possible of the contents of the raw materials containers, their work situation is such that maximum productivity is being required of them, which makes it impossible for them to adequately clean out the containers), together with the

solution that is being proposed (modify the work programme so that it is possible to adequately clean out the containers).

4.2.2.3. Feasibility of the GHP Programme

Once one has identified the Good Practices for each environmental goal, an overall check needs to be done to make sure that implementation is feasible. Excessively ambitious plans can cause the whole Programme to fail, whereas a realistic plan will in practice improve certain aspects while others will get completed in subsequent programmes as a result of the first one having been a success.

The key action with this point is to prioritise. The criteria for determining the priorities will be equivalent to those mentioned in the basic option, tool T2 T1, in appendix 1.

4.2.2.4. Application of the General Plan for the Protection of the Environment

Definitive approval of the Plan means that the projected investment and actions in the Plan get made and put into practice. As far as the associated Good Practices Programme described in the diagram is concerned, this is the moment to plan the TIME 4 indicators and to begin data collection so that a comparison can be made between the before and after of the training activities. It is also the moment to start TIME 3.

4.3. TIME 3. Training actions in GHPs

A CASE HISTORY

The environmental controller at a spinning mill has reached the conclusion that none of the factory's problems will get resolved until there was a change in the mentality of a significant proportion of the workers in the company. He has finally convinced the Director to carry out the training session that he had been asking for so long. The Director informs him that production will stop for maintenance purposes one hour before the end of the shift on Monday and that he can make use of this time to carry out the training that he has been clamouring for.

The environmental controller tells him that it is a bit at short notice, and that he will need more time for both preparing and giving the training.
The Director replies by saying that he is always raising objections to everything and that, if he wants, he can take advantage of the hour that is being offered and, if not, he doesn't know when another opportunity like the one at hand will come up.

In TIME 3,
the aim is…

To design training activities and to carry them out so that the GHPs chosen in TIME 2 are effectively transmitted to the people that have to apply them.

The environmental controller, a somewhat shy and quiet young man, prepares the training session without the help of any special methodology. The time comes to give the training and, nervous and trembling, he addresses all of the factory workers. He begins with an introduction on the importance of protecting the environment and then goes on to explain the importance of each of the pollutants given off by the industry, together with some that don't have anything to do with the industrial activities of the company. All of a sudden, he looks at his wristwatch and sees that it says two o'clock. He can't believe it; he thought that maybe five minutes had passed at the maximum, but his watch tells him that an hour has gone by which is all the time that he has. The problem is that he still hasn't started to talk about what he really

wanted to. His bewilderment reaches new heights and he starts to explain in a flustered and disorderly way what he originally proposed to say. It's now two thirty - the shuffling of feet and the murmuring of those present has become quite intense by now; their attention is only centred now on the clock; they should have knocked off some time ago and they're bound to not get paid for the extra half hour. The environmental controller decides to end the explanation by saying that the things that were left out will reach everyone via an internal message.

The following day, it is very clear to him that the training session has been a complete error. He didn't put over the proposed message - he didn't even express it in words - and bad precedent has been set for the effectiveness of any further training action.

Training actions can clearly not be improvised and they need to be planned and executed in a professional way for them to be successful.

In TIME 3, consideration must be given to the fact that, just as basic intuitive strategies are viable in the case of diagnosis and decision making (the same thing will happen in the assessment of results), the results obtained in this TIME are very much related to the quality of training and it is thus not advisable to skimp on technical resources. The basic strategy in this TIME is set so close to the advanced strategy that the reader should decide what and what not to do according to the circumstances. Although the GHPP Co-ordinator must select the GHPs and administer the approach and monitoring of the training action, it is recommendable that qualified training personnel do the preparation of the training sessions, as well as giving them.

The chosen GHPs and the goals to be achieved are the starting point for this stage. It is here where the conclusions of the analysis are put into practice after the decisions have been made, and where the ideas that have been distilled during the previous TIMES need to manifest and become real in the daily work of many people in the company. This is the biggest difficulty in this phase.

The problems that need to be resolved at this point are:

- Ignorance in general, and on all levels of the organisation, about the impact of the activities of the industry on the environment, and the fact that this is perceived as being of secondary importance.
- Activities in the company that are rooted in habits that have been optimised and orientated towards improved productivity over many years,
- Any training action that is done will have an economic impact, and this may mean decreased production and jobs being lost.

Figure 4.4 summarises the actions to be carried out in TIME 3.

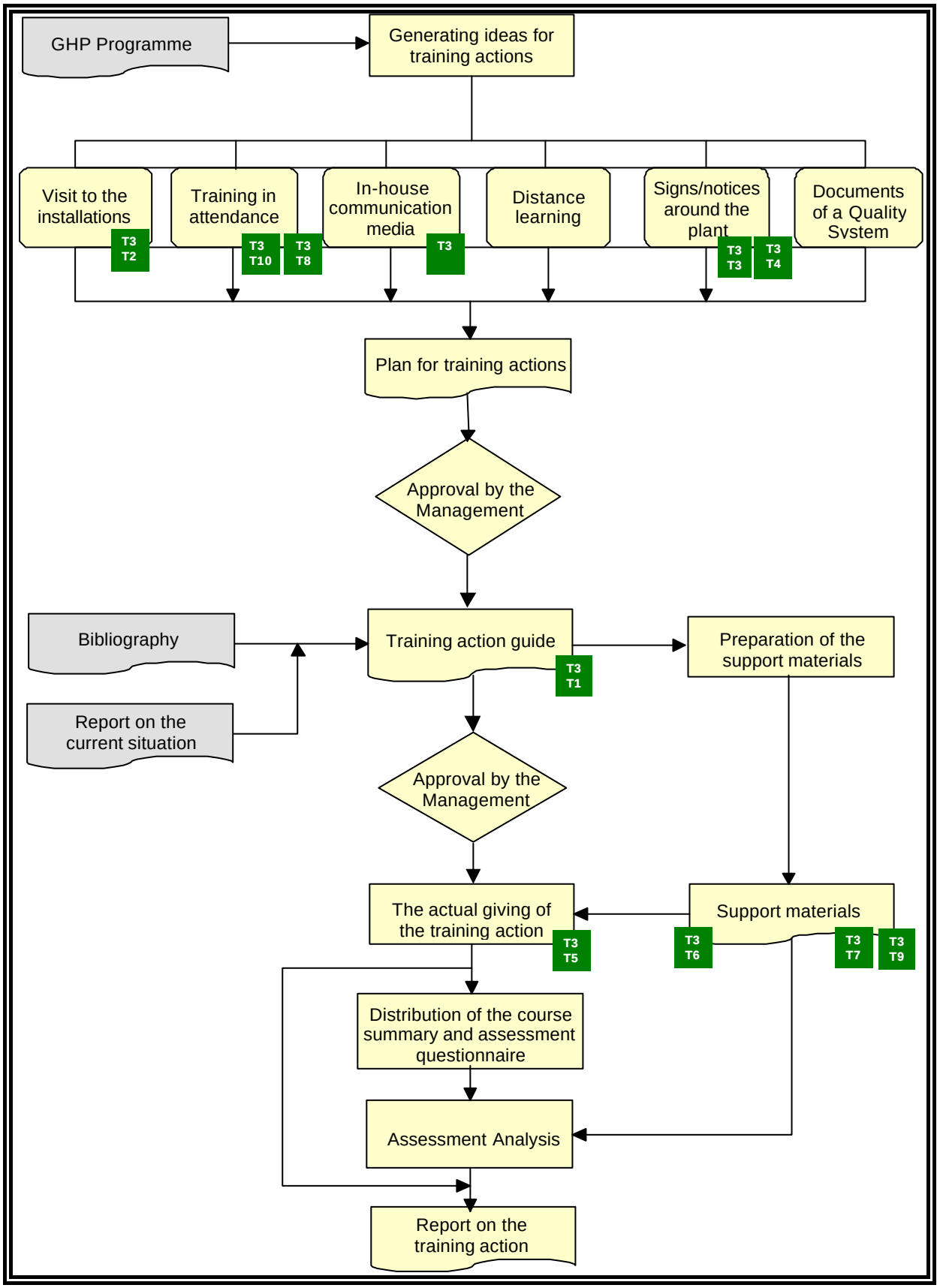


Figure 4.4. Diagramme of TIME 3

4.3.1. General planning of the training actions

Imaginative proposals are required together with the fact that the training actions need to go beyond the personal attendance type of training to which people are accustomed in order to overcome the obstacles raised in the previous point. Some ideas for going beyond the class attendance type of training are:

- Guided tour of the installations
- Publications in the company's in-house communication media
- Distance learning
- Materials in the plant;
- Use of the existing Quality System, ISO 9000 or the equivalent (if one exists).

It is recommendable to take all of these possibilities into account when designing the Training Actions Plan. A good Plan should essentially follow the sequence of 'communicate and train'.

To understand this properly, just focus on something that is commonplace, such as advertising campaigns. These make use of any resource available to project a message in order that you see the importance of a product that you aren't in possession of. So you find ourselves surrounded by the same message reaching you from a multitude of sources: radio, TV, advertising hoardings/billboards in the city, the walls of the underground, display stands, etc.

It is highly evident that if people carrying out activities that are liable to affect the environment are not made aware, they will not see this as being something that is important. So, even though “clean techniques” are explained to them, the end goal of integrating the environment into day-to-day professional activities will not get achieved.

What is being done in this TIME has partly to do with communication, so that something which is not seen as being important now can seen to be so, and partly the response to a new source of anxiety with a new way of doing something, which is the most ambitious goal of all.

It is just as important to respect this sequence during the planning of the training actions as it is to plan with a reasonable amount of time and resources within the capabilities of the company.

When planning the training, it may be difficult to resist the temptation of wanting to find room for lots of GHPs in a small training action. Doing too many GHPs in a reduced period of time will produce the effect on the trainee of "they give you lots of instruction but don't explain why". Implementation of the GHPs will be effective if the trainees understand why and with the environment it is easy to do for it belongs to everybody.

Another key issue in the Training Action Plan is selecting the “best available trainer” for each action. Even though it is an absolute term, the best depends a lot on the action to be carried out. This means that being the best one isn't always the one who is the best prepared the one with the most knowledge or the one who is the most expert. The ability to "connect" with the trainees and also the authority that the trainees confer on the trainer form part of being the best.

Doing the Training Action Plan isn't an easy thing to do. To do it well, one needs extensive knowledge of the organisation as a whole, plus some ideas about communicating and above all common sense. In large organisations, it is advisable that a team combining the aforementioned requirements carry this out.

Another element to consider, and one which was highly motivating for all of the groups who were included in the pilot campaign mentioned in chapter 3, is that the Good Housekeeping Practices Programme in general, or some Good Housekeeping Practices in particular, come from initiatives by public institutions in collaboration with private entities recognised by those receiving the training (government administration, ecological organisations, union organisations, employers associations, etc.). During the pilot campaign, the fact that the training actions bore the logotype of the Autonomous Government of Catalonia as promoters of the initiative (that was made obvious in the materials and the presence of a representative of the Autonomous Government of Catalonia's Department of the Environment during the training sessions) was one of the key factors in it being accepted by the participants who took part in the training

The Training Action Plan can be carried out by following the model proposed at the end of this chapter or by using any system that is established in the organisation itself, but likewise it is recommendable that each training action at least consider:

- The group that it is aimed at,
- The number of people in the group,
- What information will be dealt with,
- What means will be used,
- Who will carry it out
- And what will the approximate cost be in terms of time and resources

The next step consists of approval by the Management, who make an assessment of the Training Actions Plan proposal from a purely commercial perspective: what do I provide (investment) and what do I receive (results). It is obviously important for the Plan to be realistic and in proportion to the opportunities of environmental improvement.

4.3.2. Specific planning of the training actions

Once the Management has given the go-ahead, the different trainers need to be brought together. The GHPP Co-ordinator informs them of the Management's decision and gives a more in-depth explanation of what is required from the training actions that they will be in charge of.

The trainer makes an summary of the training action that is as extensive as he/she considers necessary and outlines the support materials to be used (documents, slides, posters, etc.). The following should be kept in mind when undertaking this task:

- What the goal of the training action is (the Good Practices to be imparted),
- What the level of comprehension and the interests of the group to be trained are.

Presenting training actions with language that is either excessively technical, that exceeds the comprehension of the trainees, or that is excessively commonplace may lead to invalid results. However, the trainer must never lose sight of motivating his/her audience and this will be achieved by making the interests of the audience coincide

with those that the trainer wants to put across. This process, which is very easy when these coincide, can make the task impossible when the interest of the trainees is somewhat different or if it clashes. Within his/her possibilities, the trainer must anticipate these difficulties and take measures beforehand to avoid any complicated situations arising during the training.

Once the trainer has established what the approach for the action will be (training action guide and support materials), the GHPP Co-ordinator supervises its suitability for the assigned purpose and also if it is coherent with his overall view of the company and of the General Plan for the Protection of the Environment or the company's own environmental strategy.

In the case that the Good Housekeeping Practices Programme receives some kind of institutional support (government, sector programme, union organisation, ecologists' association, etc.) the GHPP Co-ordinator establishes the way to make this support obvious within the training action, provided that this provides benefits that reinforce the audience's attitude.

4.3.3. Carrying out the training actions

It can sometimes be a complex task to put over a message with a specific recommendation to somebody and convince the person who you are talking to carry it out. However, doing this with various people and in a complex setting like the organisation of a company is a real challenge.

To be able to do this, the training action needs to be prepared in order for the training itself to have the desired effect.

Preparation includes the appropriate call for the people to meet. On many occasions, this can be suitably done over coffee but it is always recommendable that it be formalised in the usual way in the organisation. Preparations also include checking that the materials that are going to be used are ready, that the space where the training is to be done in is the one anticipated and that everything in general is ready for the people to come in.

During the talk or presentation, using whatever means, you will need to get people's attention, capture their interest and put over the synopsis in a way that is convincing.

One technique that is suitable in GHP training is as follows:

1. Portray a real process (using photography, video, a visit to the installations, description, etc.).
2. Number and describe the environmental consequences that it has. These can be termed ENVIRONMENTAL IMPACTS. This point could be otherwise described as “What happens to the environment by acting in the way that is shown”.
3. Make propositions for alternatives to improve the environmental behaviour. This is perfect for describing Good Housekeeping Practices at the level of detail that the audience requires and within the setting of the training action being carried out. It is essential when the case warrants it to state the means that are available, and which obviously have to be sufficient.

An example of this proposed technique could be applied in the case of a sack emptying dust vacuum system in a silo. The outline is as follows:

1. Show a photograph or accompany the trainees to the chimney outlet at the end of the centrifugal separator and have them see that it is filthy with dust.
2. Explain that there are defined limits for the presence of particles in the air which are regulated by law, that the particles being emitted into the air dirty the cars of people living nearby and that they have already reported this.
3. Explain that there is a centrifugal separator and filter at the end of the air intake line that catches the dust, which need to be kept operative in order to avoid the aforementioned contamination. Explain that the way to do it is by always using new filters and changing them each week, emptying the dust collector every day, closing the factory doors well and by checking at the end of the shift if there is any dirt around the chimney.

4.3.4. Assessment of each training activity

At the end of any training activity, or after publishing an article or doing a flyer campaign, the question, "What has been the result on the people that it was aimed at?" needs to be asked.

As far as training activities where contact between the trainer and the participant is direct are concerned, the immediate result of the activity can be perceived directly by the trainer him/herself by analysing the non-verbal (interest or disinterestedness, sleepy participants, lost gazes, gossiping amongst the participants, etc.) or verbal (comments in public, questions, disagreement, etc.) behaviour.

In the case of posters and stickers around the plant, and with any type of action where there is no personal contact between the trainer and the trainee, this can be perceived by observing the number of times that somebody stops to look at them or by the comments made about them when people get together.

All of this information is highly valuable for making an assessment of how the message of the GHPs that have been imparted has been received. It is thus recommendable for the trainer to make a written assessment addressed to the GHPP Co-ordinator.

Assessing the results in the way described above will provide subjective, biased information for only the comments that have been heard and the attitudes of the more extrovert people will get assessed. Objective information can be obtained without any great effort, provided that this is considered appropriate, from a questionnaire that all of the participants fill out and where we can:

1. Ask those who are taking part what their opinion is about the training activity.
2. Ask the trainees questions to assess how much they have understood about the GHPs that have been imparted.

This short period of time of approximately 5 minutes that is spent will provide information that is more objective concerning the results of the training activity.

4.4. TIME 4. Assessment of the results

A CASE HISTORY

A series of training actions have been designed and imparted to the workers at a factory to enhance their cultural mentality in relation to the environment and to show them what practices and habits are needed to reduce the environmental impact of the factory's industrial activity. Everybody considers that the training action has been a complete success and so any new action on the subject is ruled out.

The real situation does not exactly correlate with people's views on the subject. One of the things that were mentioned during the course is that waste needs to be reduced to a minimum. One worker in the packing section has decided, on his own account, to recycle all the jars that fall on the ground or that have got some small defect. As a result, in one month the company has received seven complaints from customers complaining that they have found extraneous objects in the packaged product.

In TIME 4,

the aim is…

To check the effectiveness of the anticipated GHP Programme and to get everyone to participate in the results of the GHP Programme, either through the feeling of satisfaction, by realising that even more could be done or, in the worst of cases, that nothing at all has been done.

Another thing that was said in the course is that maximum savings need to be made in the amount of water used. Another worker has decided, also on his own account, to not rinse out the machines that he cleans with water, nor to dry them with clean, disposable paper. Instead, after washing them with detergent he dries them directly with a cloth that gets cleaned once a week. Even though they don't know it, the people in quality control have detected the presence of the remains of detergent and dirt in the product being sent to the market.

It appears that some of the messages put across during the course have not been interpreted very well. The course wasn't as perfect as was believed. This is logical! It is unrealistic to think that all of the messages programmed in a training action get across to the participants and, moreover, that they get applied in the appropriate way.

It is no longer a question of perfect training actions but more of the necessity of implementing a system for assessing and monitoring the results of the actions, in order to establish the appropriate corrective actions.

One thing is to say something and another is to get it done. After having spent time and invested resources in saying what needs to be done (GHPs), the real situation may be somewhat different from the GHPs that everybody considers to be suitable and necessary or even that they are interpreted in a totally different way to that anticipated.

This TIME phase is for:

- Doing the processes according to the GHPs that have been explained,
- Stopping, once in a while, and checking if things are being done in accordance with the training.

4.4.1. Basic strategy

The system proposed for making the periodic assessment of the Good Housekeeping Practices Programme is structured according to 4 overall goals with greater reinforcement being given to that one immediately following the training and decreasing in progressively longer periods of time. The gradations could be established after the last training action and as follows:

1. 1 month after,
2. 3 months after,
3. 6 months after,
4. Final assessment after 10 months

As a basic option, these goals could consist of Key Group meetings where the applied GHPs are analysed one by one and where answers are given to each of the following questions:

a) Is the GHP being carried out?
b) Has the anticipated investment been made and have the appropriate resources been provided?
c) Are the training actions understood?
d) Are the benefits obtained the ones that were anticipated, and are the indicators developing in the anticipated way?

The GHPP Co-ordinator must take notes and prepare a summary of each of the meetings that he/she brings to the notice of the whole work force of the company via the Key Group, the Heads of Department and the notice boards.

This assessment should serve both the GHPP Co-ordinator so that he/she can undertake corrective actions in cases where the results have not been appropriate, and all of the people who have taken part in the trainings, and as such is a reference of the effectiveness of the GHP Programme. These results will also enable a decision to be made on whether it is necessary to reinforce the GHPs given in the training sessions or if it is possible to continue with the preparation of training for new GHPs.

4.4.2. Advanced strategy

The advanced strategy involves the meetings of the Key Group and the establishment of quantitative indices that give no room for error or subjective interpretation.

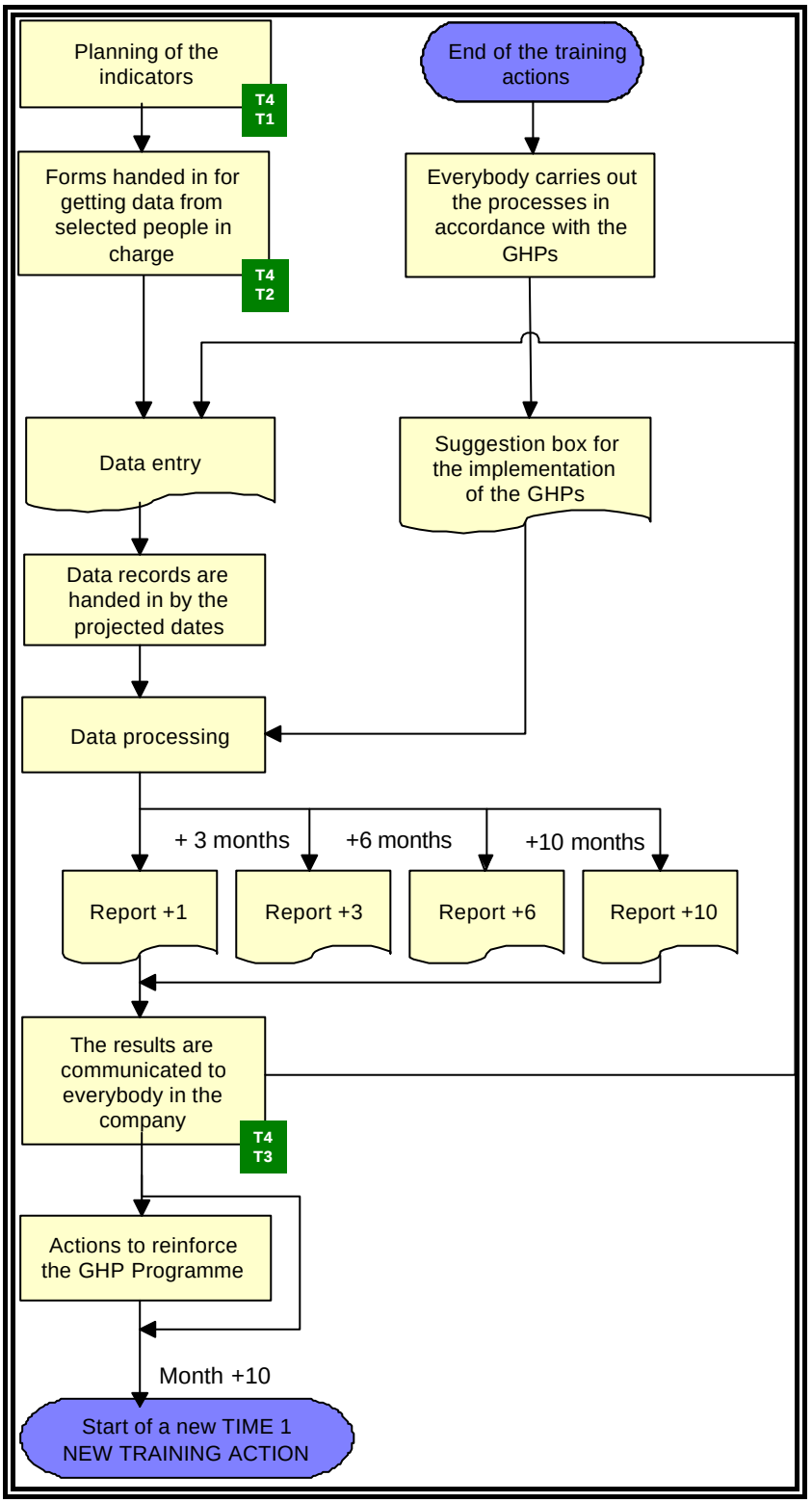


Figure 4.6. Advanced strategy for TIME 4

4.4.2.1. Indicator planning

Indicators are used to make decisions about many things in everyday life. The speedometer in the car tells you to reduce speed so as to not exceed the speed limit, the rev counter tells you the best time to change gear, and the petrol indicator when to stop and fill up the tank.

In industry, where many processes are very complex, all of the machines and installations have control panels or rooms where there are countless indicator dials for the temperature, pressure, time, product concentration, etc.

It is not an easy task to define the most appropriate indicators that provide information on the application and success of the GHPs but it is an essential one.

The GHPP Co-ordinator is the most suitable person to plan the indicators, for this it he/she who has the best overview of the company and who is most familiar with the GHPs and the whole process of selecting them.

In this context, two types of indicator can be defined:

- Indicators of habits
- Indicators of results

The habit indicators give information on the degree to which the GHPs have been introduced into the day-to-day work process.

The results indicators give information on the results of the environmental vectors of the company (use of resources, emissions and waste).

The GHPP Co-ordinator first decides on the habit indicators for each Good Housekeeping Practice. For example, if the decision made "*for maintenance to check the state of the vats and stopcocks once every month"* is a good Housekeeping Practice for minimising resources and emissions, the indicator could be:

$$\% \text{ Of checks month i} = \frac{\text{No. of checks made during month i}}{\text{No. of vats and stopcocks}} \times 100$$

Once the habit indicators have been decided on, the results indicators need to be defined. In this case, if there is a stock control card for each of the vats and liquid dosages, this could be:

Environmental wastage index = Dinv1 x Camb1 + Dinv2 x Camb2 +…+Dinvn x Cambn

Where:

- Dinv n = Differences in stock for product n in KGs.
- Camb n = Coefficient of environmental impact of product n
- Camb1 if n is an inert and abundant product (for example, N_2)
- Camb2 if n is a non-special, scarce product (for example, water)
- Camb5 if n is a special and highly scarce product
- ...

There will usually be some GHPs that affect the same indicator. This could be the case of the amount of water used per month, which gets affected by the maintenance stopcock GHP or the elimination of waste and subsequent cleaning with water.

Once a decision has been made concerning the information to be obtained, the GHPP Co-ordinator organises the data collection sheets according to the people who are designated to gather the necessary information. The data required and the data collection frequency need to be clearly noted.

Another non-systematic indicator that can be used is to create a suggestion box on the GHP Programme being put into practice, which is open to everybody who participates. On the suggestion box could be written:

I think that the GHP…

Following a training action, you should explain that the suggestion box is there and how it works, and people should be encouraged to participate. The suggestion box should work in such a way that only the GHPP Co-ordinator has access to it, both signed, and anonymous notes should be accepted.

4.4.2.2. Data collection

The data entry sheets are given to the people who have been considered appropriate in the organisation so they can provide the data within the time limit requested.

For example, the head of maintenance could be designated to obtain the data on *the no. Of maintenance checks per month,* because he has the workers' worksheets. Before getting the required data, the head of maintenance could look in the records for the number of checks or, with a certain amount of foresight, he could note down on a separate sheet every time that one is done.

The obligation of the GHPP Co-ordinator is to make sure that it is very clear what data are required, and to provide a simple sheet where this appears. The way that the chosen person organises this is his/her own responsibility.

When there is any doubt as to the veracity of certain data, it is recommendable for the GHPP Co-ordinator to request complementary data to verify their exactness.

4.2.3. Periodic reports

The GHPP Co-ordinator compiles the different data within the anticipated periods (+1, +3, +6, i +10 months).

It can be very useful for the Co-ordinator to have a spreadsheet where all the data appear together and where the indicators get calculated automatically.

It is advisable to present the results of these indicators in a simple, graphic way to the people in the company so they can make an overall assessment of what their contribution has been to the expected result. In the case where the GHPP Co-ordinator has established a lot of indicators, he/she should consider which the most

important and easiest ones are to be put across, because no-one will pay any notice if this is done in an excessively complicated way.

The GHPP Co-ordinator also makes a summary of the most significant comments that have been left in the GHP suggestion box, with additional comments and clarifications, if he/she considers this appropriate.

CHAPTER V: AND AFTER…

5.1. A Company with an Environmental Culture

The decisions in a company are made by all the people that work in it so the relationship of a company with the environment is, in the end, the result of the people. Environmental impact is not so much a question of technology but of people. Promoting appropriate environmental culture in the different areas of decision-making in an organisation must be a permanent on-going goal of any company.

5.2. Be attentive

One could think that once the time signature has been established for the piece of music, then it would be complete. The musical score indicates however that this is just the rhythmic basis and that the melody and harmony still remain to be interpreted. The complicated thing is that no-one has written the score and although lots of treatises have been written and concepts formulated concerning the challenges facing the environment, nobody has actually established which one will be ideal for their own particular industry or company.

Many environmental forecasts over the last fifty years have been excessive in terms of their disheartening expectations. However, they have made us realise that there are limits to the environment and that some of these limits, some possibly still unknown to us, may make tomorrow's industrial activities unsustainable. Given this fact, there is only one answer: be aware.

The strategy of being aware implies a very important jump with respect to the attitude of most companies, which at present is to simply comply with legislation. Although this is a permissible strategy, it is hazardous because changes in environmental

regulations may mean that a company's environmental management becomes insufficient. Socially speaking as well, there has been a substantial increase in the general public's awareness of environmental matters.

At the very least, the proposed system of the GHP Programme with its four TIMES is a simple tool for keeping people actively aware. Designing and cyclically reapplying Good Housekeeping Programmes is the minimum guarantee for a company with an environmental mentality rooted in the corporate structure to stand up to the challenge of the future.

As was mentioned before, new instruments have appeared in recent years to help face the environmental challenges in industry and that can serve as a further opportunity for maintaining this state of awareness active. The industrial corporate culture has definitely progressed in recent years with the incorporation of concepts like environmental management systems, cleaner production, clean technologies, pollution prevention at source, best available technology (BAT), environmental audits, environmental impact assessment, life-cycle analyses, etc.

The most effective making environmental culture real in a company is by appropriately using one or several of these concepts or instruments to bring about improvements in the environment in a way that conforms to the special characteristics of a company and/or industry.

5.3. Tools

5.3.1. Environmental Management Systems (EMS)

A company's Environmental Management System includes all of the organisational structure, procedures, responsibilities, practices and resources that define the environmental policy of the company and the way that it puts it into practice.

These management systems enable companies to:

- Reduce environmental expenditure due to the lack of or inefficiencies in management (treatment and/or elimination of waste, fines, insurance, taxation, etc.).
- Guarantee high levels of environmental protection.
- Continually improve their environmental behaviour.
- Easily demonstrate to the pertinent authorities and clients the measures that have been implemented in relation to the environment, and thus forestall any misunderstandings.
- Increase employee motivation.
- Guarantee the compliance with current legislation and avoid penalties due to ignorance or the lack of planning.
- Make the environmental commitment of the company or industry known, together with the endorsement of a third party.

The elements that make up an EMS are very similar to those of a quality management system (type ISO 9001). In very general terms, the main elements of an EMS are:

- Environmental policy,
- Goals and milestones,
- Authorities and responsibilities,
- Training,
- Documents and records,
- In-house and external communication,
- Preparation and response to emergencies,
- Audits.

Figure 5.1. Gives details of the stages in an EMS design and implementation project.

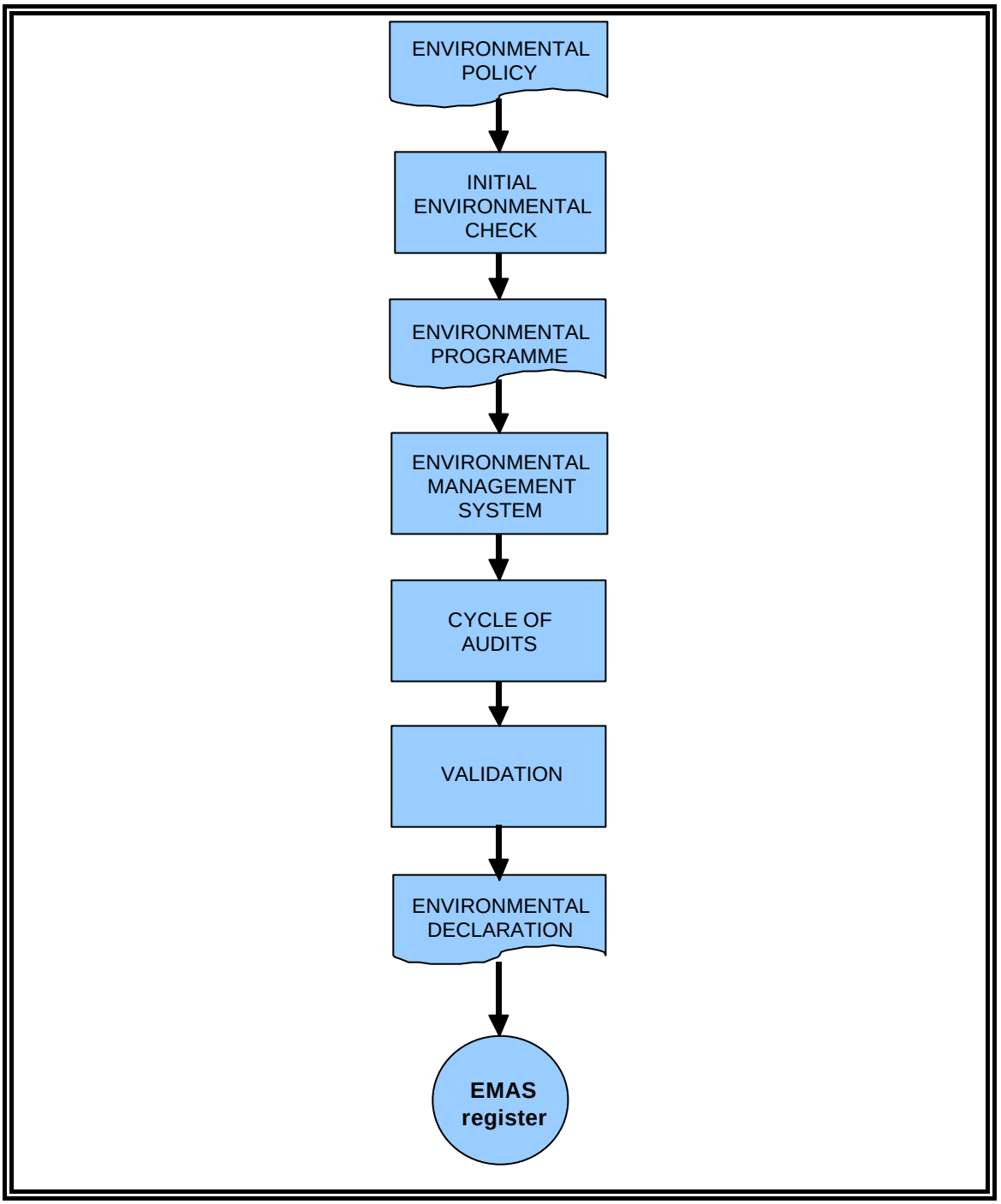


Figure 5.1. Outline of the process

5.3.2. Pollution prevention at source

Pollution prevention at source groups together a series of organisational, operative and technological measures that are necessary for reducing the quantity and hazardousness of the waste materials generated in a production process (main or auxiliary) by way of reduction or recycling at source.

The main advantages provided by prevention at source, either in an existing process or even better in a project for a new industry, are the following:

- Savings in raw materials,
- Savings in natural resources,
- Improvements in production methods, with an increase in performance,
- Savings in expenditure on the treatment and management of waste flows,
- Improvements in the quality of the product,
- Improved corporate image

In no way does prevention at source impede the implementation of a SEM; in fact, they are complementary for reduction and/or recycling put the emphasis on the production system, while the SEM puts it on organisation and planning.

The general stages for achieving the prevention at source of pollution generated by industrial activities are:

- The planning and organisation of a diagnosis,
- The collection of economic data, data on materials, etc.
- The assessment and analysis of the data and the researching of possible alternatives,
- Analysis of the technical feasibility and economic viability of the proposed alternatives,
- The prioritisation of actions,
- Implementation of the viable alternatives brought together in the diagnosis,
- Repetition of the process (on-going assessment)

Guides have been published for carrying out the diagnosis.1

1 RAC/CP has edited a Manual for carrying out a *Minimisation Opportunities Environmental Diagnosis (MOED), (2000).*

5.3.3. Life-cycle analysis (LCA)

The life-cycle analysis consists of a series of techniques for identifying, classifying and quantifying the pollution load and the material and energy resources associated with a product, a process or an activity, from the moment when it is conceived to its elimination. The life cycle, within this ambit, is the series of phases through which a product passes while it is useful and includes production, use and elimination.

The goal of the LCA is to reduce any environmental impact associated with a product, process or activity by reducing at the same time the use of raw materials, energy and the generation of waste flows by starting actions to improve the system under study.

The main applications of LCA in industry, amongst others, are:

- To compare materials,
- To compare products that are functionally equivalent,
- To identify the processes and resources (material and energetic) that contribute most to a product's environmental impact,
- To provide information on the product/process/activity,
- To direct a strategic planning,
- To increase competitively,
- To provide information for the consumer and official authorities

5.3.4 Environmental Audit

The Environmental audit is the systematic, documented, periodic and objective assessment that is made to establish if the management system and the environmental behaviour of a company:

- Satisfy the established regulations,
- Have been implemented effectively, and if they are
- Adequate for achieving the environmental policy and goals that have been set.

An environmental audit answers the question *Where are we right now?* And it enables one to clearly see *where we should be going.*
The current situation is identified according to the following four aspects:

- Legislative and regulatory requirements of the area where the company is located,
- Assessment and recording of significant environmental effects,
- Examination of all of the environmental management practices and procedures,
- Assessment of the treatment given to previous incidents and cases of non-conformity

As a consequence of the assessment of the aforementioned aspects via the study of documents, reports, interviews and an inspection of the installations, a report is issued with:

- The strong points, weak points, opportunities and hazards of proposing goals,
- A list of the significant effects, and
- A list of the current applicable legislation and new developments since the previous audit.

CHAPTER VI: CONCLUSION

The system that is proposed in this manual is more of a concept than a format. This is because you are not going to find the best GHP Programme for a particular company in a manual. The best Programme is the one you do yourself after having consulted different treatises, of having listened to other people who are more expert than yourself and asking for their help and, above all, after reflecting on the real situation in your company and the industry. The best programme is the one that challenges the problems facing your own company and that uses your company's kind of in-house communication.

The best Programme will be the one in which the Management entrusts its environmental policy, and which counts on the active participation of all the people who are involved in the decision-making process in the company, especially those who are involved in each of the different areas, processes and products. GHPs involve an environmental culture that impregnates the whole organisation so that the impact on the actual installations, machines and available methods is minimal. If nobody knows about the GHPs, there is a very low probability of everybody finding about them. If nobody explains the need to respect the GHPs, they'll just end up being good environmental intentions.

If, after having read up to here, the reader fancies making a change in his/her company, environmentally speaking of course, then take into account the resources available and do trainings in the GHPs that are available. Given that economic resources and people's time are limited just like natural resources, to be able to do this you'll have to do something that is difficult and that is choose according to your priorities. This exercise is very beneficial for achieving your assigned goals, which will then become the starting point for new initiatives for improvement of the same system, but with new horizons that are more and more respectful of the environment.

The best GHP Programme is not an isolated programme in a labyrinth of isolated programmes involved with quality, productivity, and hazards at work or new technology. The best GHP Programme for your company or industry is integrated in a management system like the one proposed in the four TIME phases or in other more

complex ones. These systems endeavour to embrace the concepts and the material resources for developing them, and guarantee the coherence of the day-to-day decisions made by the different people in charge in the company.

Despite the effort that it represents, the best GHP Programme for your company or industry will only represent a small contribution that, together with the many contributions of so many people like yourself that will have turned the best GHP Programmes into something real in their companies, brings us closer to the goal at hand: to produce in harmony with the environment so that it is available in the future.

APPENDIX 1: TOOLS

TOOLS INDEX

TIME 1 TOOL 1	GENERAL DATA COLLECTION	T 1 T 1

The overall figures for the company in terms of the environment can be obtained from:

a) Invoices for resources consumed (water, gas, and fuel); packaging, certain resources consumed but eliminated and not incorporated into the end product, etc.
b) Data given to the authorities in the different periodic statements relating to the environment (waste, wastewater, atmospheric pollution, etc.)2.
c) Continuous environmental impact assessment indices of specific activities.

An outline of the information to be compiled, together with the different sources, is given in table A1.1.

Aspect related with the environment	Sources of information[3]
Waste	Annual waste statement
Noise and smells	Professional licence, periodic checks
Emissions into the atmosphere	Periodic reports
Wastewater	Pollution statement, periodic check
Water consumption from private wells	Statements and/or reports
Water consumption, fossil fuels, raw materials, etc.	Suppliers' invoices or the business' accounts
Elimination of certain substances or products	Purchasing invoices and excise registers

Table A1.1. Sources of general information

In some cases, the data won't be very precise, so they will need to be verified during fieldwork.

Although it is essential to compile the annual values for the last period when collecting the data, it may also be useful to have dossiers available for use in the training activities, whenever possible.

2 In countries where this type of statement exists.
3 In cases where these exist.

TIME 1 TOOL 2	**INTERVIEWS WITH PROCESS CONTROLLERS**	**T 1** **T 2**

It is fundamental to know the opinion of the people who are directly responsible for a process and who control the work organisation of the workers to be able to establish the level of culture and awareness in relation to the environment. These interviews can also provide the GHPP Co-ordinator with more knowledge about the process itself.

The specific information that can be obtained is as follows:

- The level of awareness towards the environment in the area under their responsibility;
- The willingness to act in agreement with Good Environmental Practices;
- What support is expected from the management and workers;
- Which aspects are considered to have more influence on the environment
- Doubts of the GHPP Co-ordinator's about the operations under his/her supervision can be dissipated.

While there does exist an established outline, the ideal for the interview is for it to be as natural as possible with both the person in charge of an area and the GHPP Co-ordinator acting in a normal way. The interview should not be at all like a survey or audit, because what is required is their real opinion; it should just be a conversation to find out the person's opinion.

T 1

T 3

TIME 1 **TOOL 3**	**INTERVIEWING THE WORKERS**

It is also fundamental to know what the workers' opinion is about the different processes in the industry for this is the starting point (the real situation and degree of awareness) and it also provides specific, highly valuable complementary information. Be aware that if the workers are asked for their opinion, their ideas will need to be taken into account and feedback given at some time afterwards. It also has to be made very clear why this information is being asked for and what it will be used for, for otherwise they may feel as though they are being inspected and threatened.

When developing this tool, one needs to be aware of both the information that is required and the opportunity of carrying out an initial action to make people aware in general and above all make it very clear that the information requested is aimed at bringing about environmental improvements in industry.

Specific information that can be obtained from these interviews includes:

- How a worker contributes to improving the environment from his/her workplace;
- The support he/she receives from their immediate superior or from the company's management
- The aspects of the worker's area that have a negative effect on the environment.

The number of interviews to be carried out will depend on the criteria and the time available to the GHPP Co-ordinator. At any rate, it is useful to identify the opinion of at least one, if not two workers in each process, the latter being recommendable for it would enable the comparison of two different opinions.

TIME 1 TOOL 4	FIELD WORK IN THE DIFFERENT PROCESSES AND OPERATIONS	T 1 T 4

Carrying out fieldwork in the different processes will provide information on:

- Existing resources
- The different activities that make up the processes
- The coherence and genuineness of previously compiled data
- The pollution that is generated in each of the activities, and
- Above all, if this pollution depends on people's attitudes.

For the field work, all one needs to do is observe and note down as precisely as possible the data concerning the different operations involved in the process, not just the production activities but also maintenance, cleaning, and preparation, as well as any possible emergencies or incidents that may occur.

For the fieldwork, a flowchart is fundamental for describing all of the operations that make up each of the processes that are carried out. For each operation, all of the appropriate information concerning the environment and related with the operation is recorded. Figure A1.1 shows an example of how to present the information that has to be compiled or checked for each operation:

❶ Previous process or operation

❷ Name of the operation

❸ Quantity of pollutants emitted into the air, signalled with a (P) if this is affected by the workers' participation.

❹ Quantity of pollutants released as wastewater, signalled with a (P) if this is affected by the workers' participation.

❺ Quantity of solid waste generated by the activity, signalled with a (P) if this is affected by the workers' participation.

❻ Other environmental aggressions produced by the process in question (noise, heat, etc.), signalled with a (P) if this is affected by the workers' participation.

❼ Resources used (energy, steam, raw materials, and packaging)

❽ Following operation

❾ Operation number

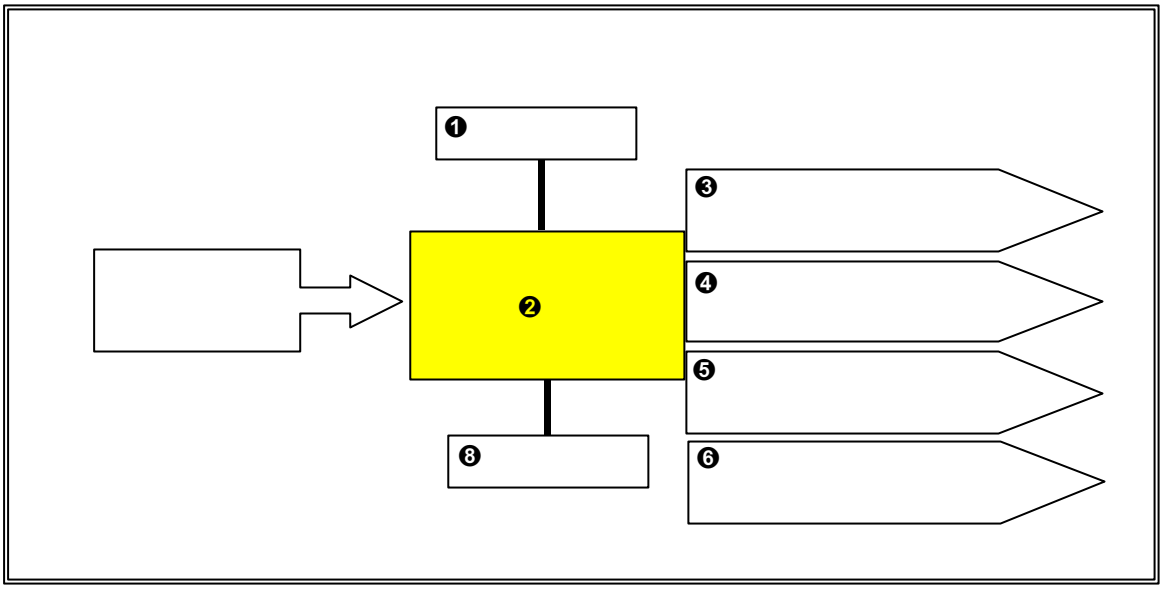


Figure A1.1. Description of the elements that make up the environmental profile

Any additional information is jotted down on a blank sheet of paper, with reference always being made to the operation and the process. Interesting additional information may include:

- Name of the machinery used for carrying out the operation and the capacity.
- Devices, containers, information and the existing means in general aiding the implementation of Good Environmental Practices.
- The number of people involved.
- The degree of automation of the operation, and
- Any other relevant information.

It can be interesting during field work to take photographs of the activities and of their different results (for example, waste on the floor, a puddle of water leading to the drain, a container, etc.) for they serve as very useful additional material when making the report and also for training actions that may subsequently be necessary. It is advisable that they show the details of a real situation that is being described and for them not to be just snaps or views (see figure A1.3.).

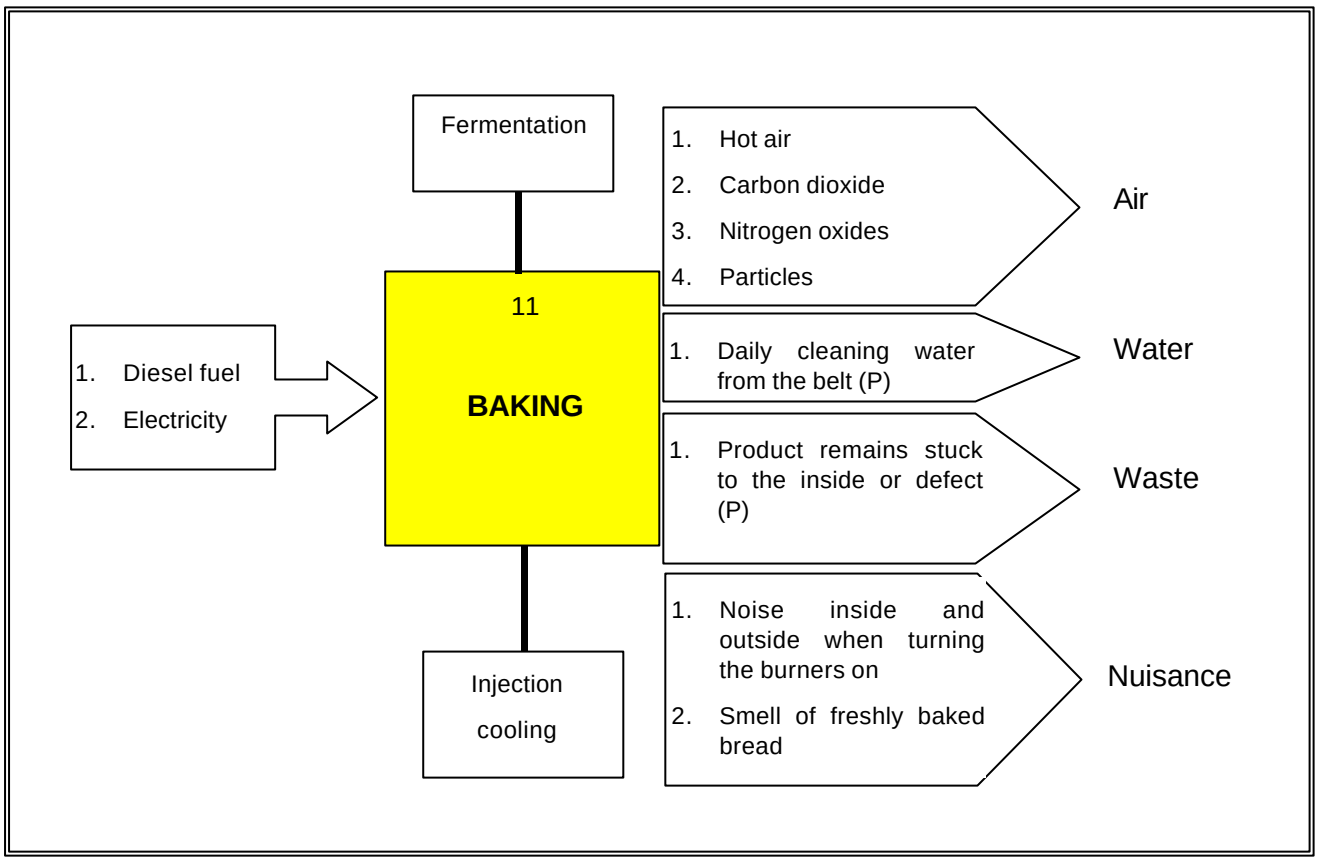


Figure A1.2 Environmental profile of the baking operation

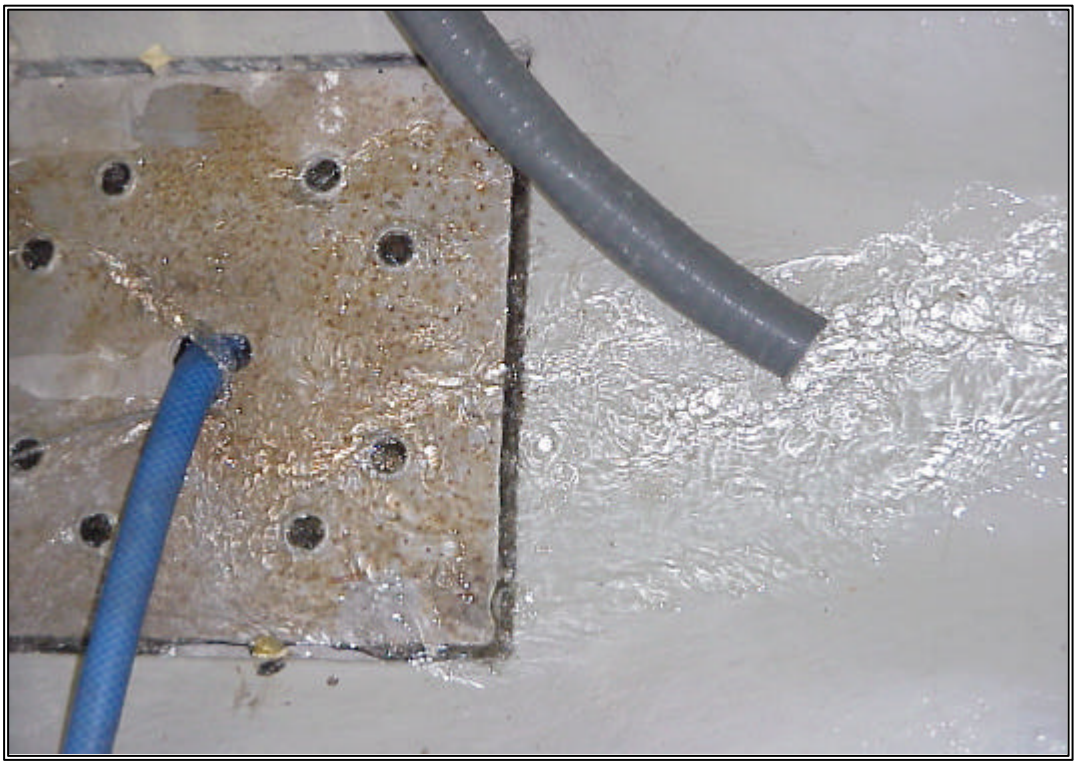


Figure A1.3. An example of a photograph made during field work

T 1

T 5

TIME 1 **TOOL 5**	**BRAIN STORMING WITH THE PROCESS CONTROLLERS**

Brainstorming as a tool makes use of the creative knowledge and experience of a group of people when carrying out tasks.

Here, the people who are familiar with each operation or process are invited.

Going round the group one by one, each of the participants is then asked to make proposals for reducing the waste flows generated by each operation. Each time it goes round, they only talk about one element of pollution. The GHPP Co-ordinator compiles the proposals made by each participant for each element discussed.

Once all of the ideas have been exhausted, all of the proposals for a specific operation are checked together, and each person can give their opinion on how good they think the proposals are.

T 2

T 1

TIME 2 **TOOL 1**	**WHICH GHPs NEED TO BE IMPLEMENTED**

Using their knowledge and experience, the Key Group, together with the Management if necessary, will have to decide which GHPs need to be applied.

Here the problem is to prioritise. If this need arises, the GHPP Co-ordinator with the support of the opinions of all of the Key Group chooses the GHPs in the following order:

1. GHPs that provide obvious and important practical results for the majority of the people in the company.
2. GHPs that are directly related with the compliance of some legal requirement.
3. GHPs that bring about a lower environmental impact.
4. GHPs that produce a saving in costs that may have repercussions on environmental investment,
5. GHPs that have an important educational component and, although their environmental and economic benefit is small, they thus have an important effect on the environmental culture of the workers.

It is important to bear in mind that a Programme that is too ambitious and that is not completed may jeopardise future programmes. It is important to choose few GHPs but to choose them well.

When making the choice, one also needs to think of the effort involved in terms of training and the dissemination of each GHP and if the help of experts will be necessary for doing the training. Knowledge of the time available to the personnel and the group of trainers, together with the money that is available if training actions have to be paid for, is important for calculating this. In terms of the estimate, one can calculate that 20 people can be trained in three Good Housekeeping Practices in a training that lasts one hour long.

TIME 2 TOOL 2	GENERAL PLAN FOR THE PROTECTION OF THE ENVIRONMENT

T 2

Proposals for a company's General Plan for the Protection of the Environment consist of the following elements:

- General diagram of the operations with the indication of those that are considered to be critical for the environment,
- Environmental profile of each operation with the defined goals,
- Table with the implementation of goals for each operation.

An example of the Plan follows, which deals with the manufacturing of the tracks of a toy train set.

The process diagram could be like the one in figure A1.4 where the critical operations in environmental terms are marked in red.

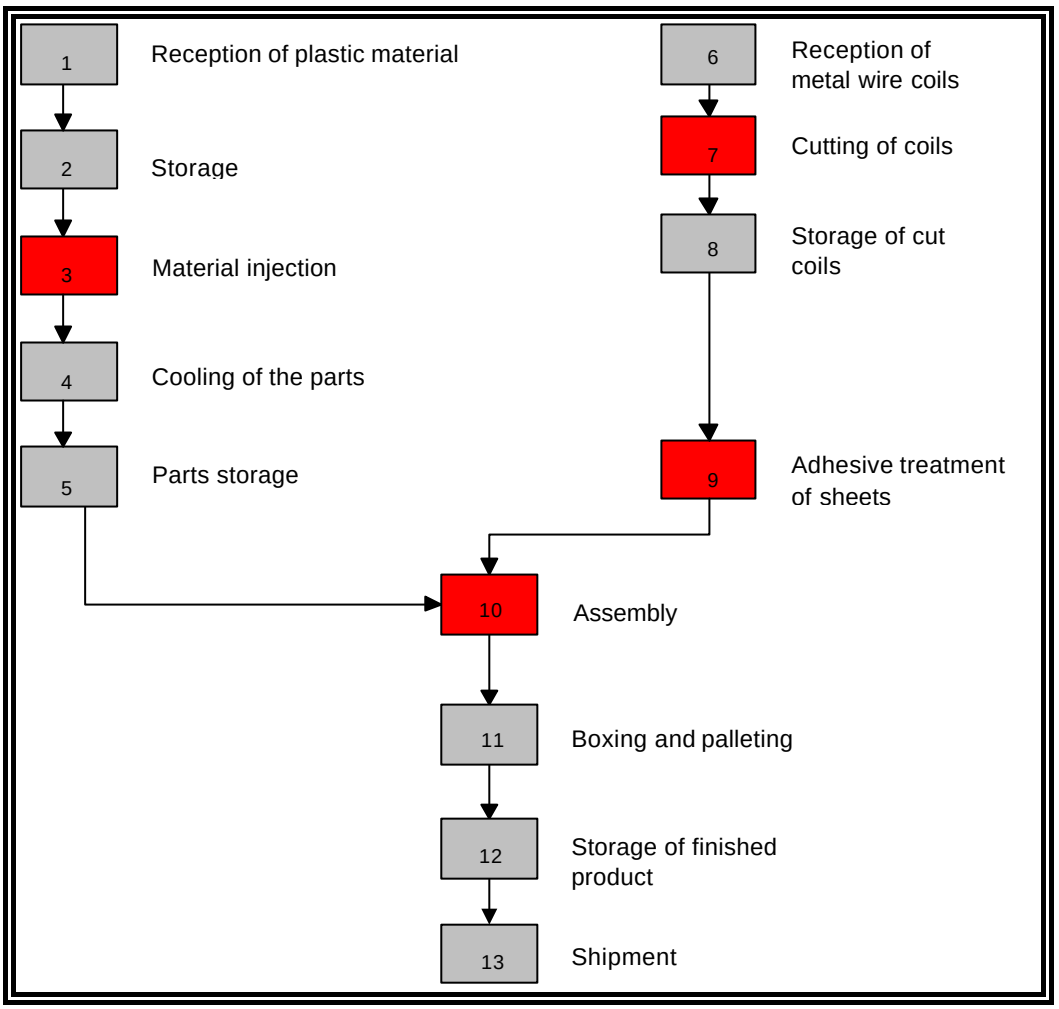


Figure A1.4. Diagram of the production of the tracks of a toy train set

Figure A1.5. shows how the environmental profile of the previous point in the definition of environmental goals (EG) is transformed.

This goal is completed in the goals implementation table that appears in figure A1.6.

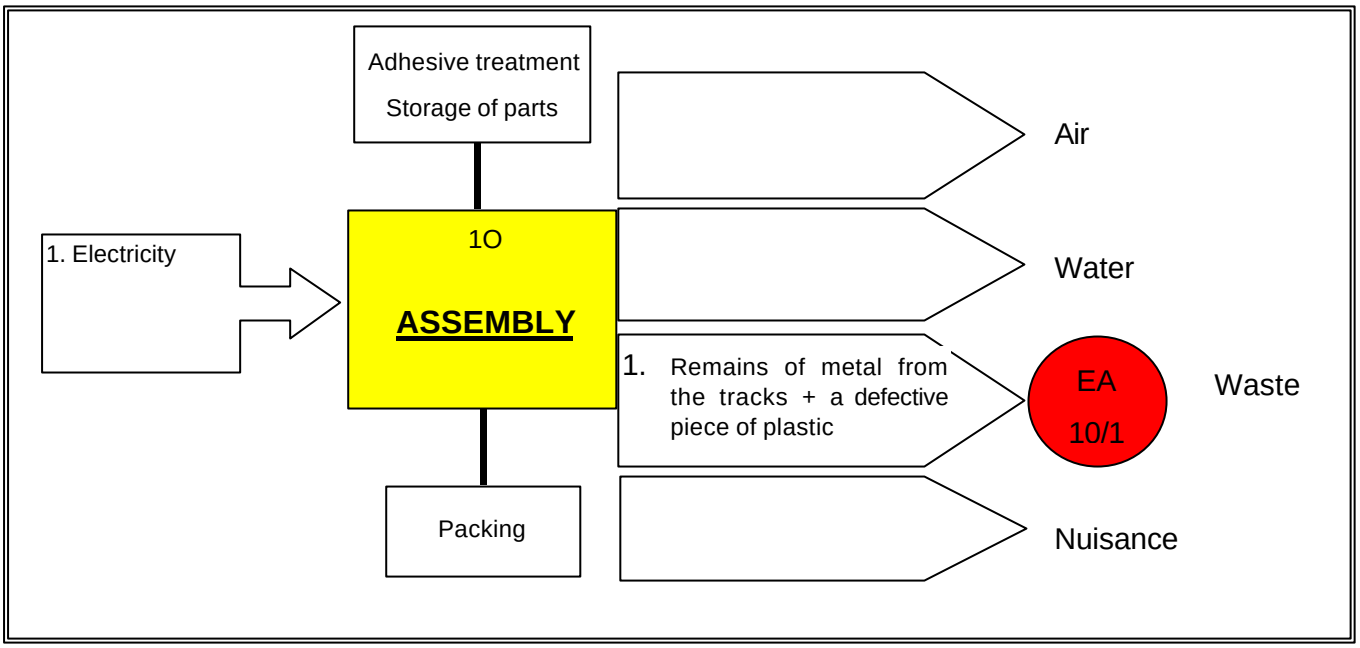


Figure A1.5. Environmental profile with defined goals

	EG 10/1
DEFINITION OF GOAL	Recycle 100% of the waste plastic from the injection operation and valuate the waste metal externally
INSTALLATIONS AND TOOLS WITHIN REACH	Containers with signs and pliers
PROTECTIVE ACTION	Separate the metal from the plastic and classify it correctly
PERSON IN CHARGE OF ACTION	Assembly worker
CONTROL	Supervision of the separate collection containers and the ordinary ones after each shift
PERSON IN CHARGE OF CONTROL	Charge-hand
CONTROL CHECK	None will be done
ACCEPTED LIMITS	Correct separation in the separate collection containers, and the absence of defect tracks in the ordinary waste container
CORRECTIVE MEASURES	Reprocess the tracks that are incorrectly classified
PERSON IN CHARGE OF DECIDING THE CORRECTIVE MEASURES	Charge-hand
RECORD OF THE CORRECTIVE MEASURES	Daily production report

Figure A1.6. Details of the implementation table of the goal from figure A1.5.

TIME 2 TOOL 3	GOOD HOUSEKEEPING PRACTICES PROGRAMME

A way of clearly representing the Programme of the defined GHPs using the criteria of the tool B2 T3 is again by using the environmental profile.

Given the issues raised in the case of TIME 2, the implementation of the GHP would be indicated in the profile (see figure A1.7.) and documented in a more concise way in a summarised table of the GHP Programme like the one proposed in form T2 F2 of appendix 2

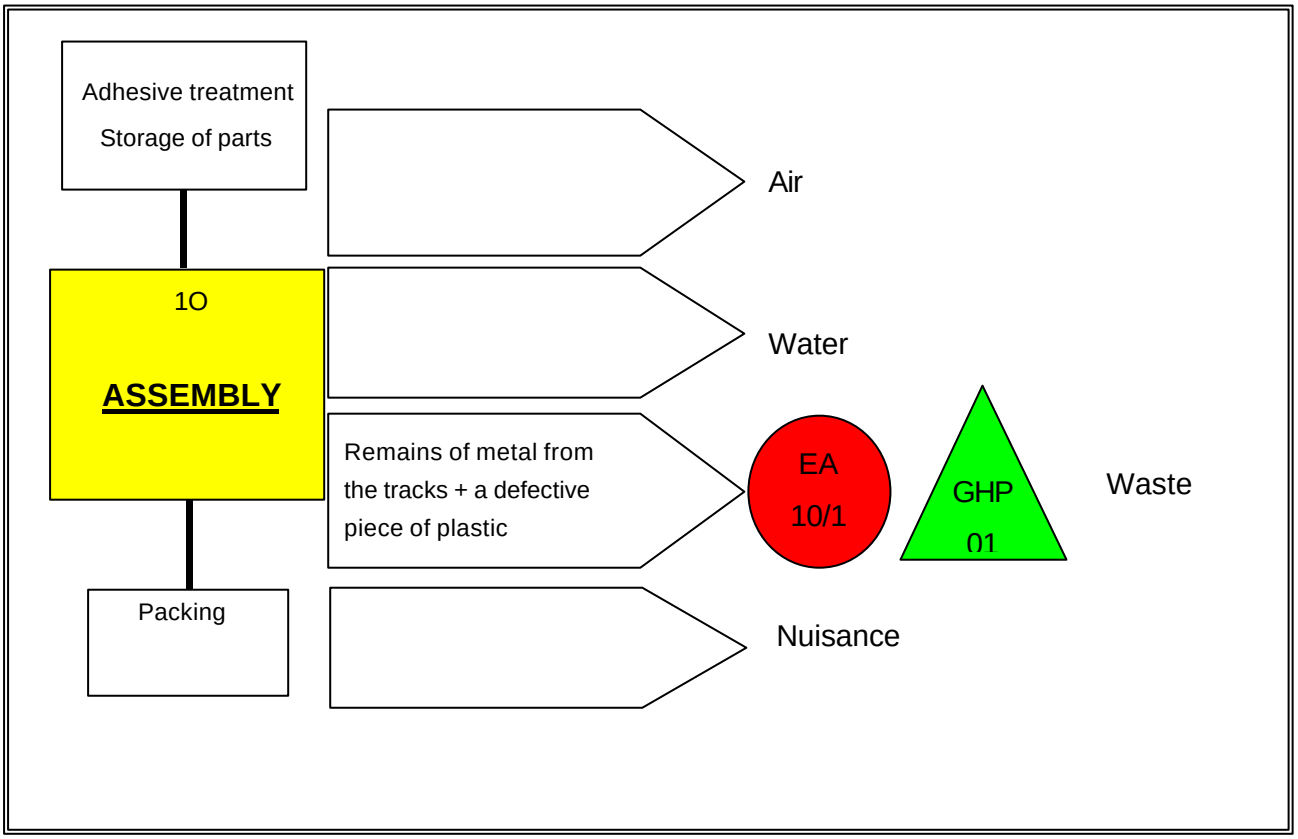


Figure A1.7. Modification of the environmental profile with a GHP included

TIME 3 TOOL 1	THE SCRIPT FOR THE TRAINING ACTION

When faced with having to write down on a blank sheet of paper something that needs doing, the question, "*Is it worth spending time writing down what I need to do?* Can come up in one's mind*.* And if the answer is yes, another one automatically comes to mind: *How detailed does the description need to be?*

There is no universal answer to these questions and each trainer has to find his or her own personal answer. But before answering them, he/she should think for a few moments on the following points:

- How long will the anticipated training action be?
- How confident am I about the subject?
- What experience do I have in training and speaking in public?
- What kind of response will the audience expect?

After asking yourself these questions, if you feel you may have some difficulties in being able to put across the GHPs that you have been entrusted with, get the necessary information that will help you to get around them.

A script for a training action must emphasise very clearly the different parts of the presentation, which usually are:

a) A definition of the subject. Make a summary of what is to be explained in the session and make some point evident so that the participants can start to feel what is going on.
b) A programme of the subjects to be dealt with.
c) A vocabulary of terms that will be used. This can also be made during the presentation as expressions appear, although if you do it this way, it is advisable to make a brief note in the script so as to not forget.
d) First GHP. Explain the details, give an example and ask questions to reinforce the learning experience.

e) Second GHP. Explain the details, give an example and ask questions to reinforce the learning experience
f) A summary and reminder of the practical application of the knowledge acquired.

The script should clearly distinguish between the different parts of the talk and this can be done graphically by using an index card for each part or by separating them visually on the same page with shading and colour.

Secondly, the script has to contain the most important concepts of each of the sections, followed by notes with anecdotes or examples to illustrate what is being put across.

One of many possible alternatives is the very complete script given in form B3 F2 in appendix 2.

TIME 3 TOOL 2	INDUSTRY ITSELF: THE IDEAL CLASSROOM. THE TOURIST ROUTE	T 3 T 2

Disagreements between two different points of view are basically often due to different ways of viewing reality. The difference in the way of seeing things occurs because the two sides in conflict have access to different information. Presenting a real situation as it is can be a useful strategy for providing data that is lacking to the other who we wish to convince so that they have the same point of view as we do.

GHP Training Actions face the challenge of modifying habits, and one strategy for convincing is by posing the reality of environmental impact in all of its harshness, so that the recipients of the training change their scale of values.

People are all very familiar with their own industrial activity and maybe even too familiar with it but, as was said before, the knowledge that each one has and the reality that each one knows are warped by the problems and experiences that we all face. The environment, however, has surely never been raised as a question in general terms and in the vast majority of companies, is considered as some kind of goal in relation to which emissions into the water are reduced and certain types of hazardous waste classified, and only then by one or two people in the company.

Concentrating on something specific, the vast majority of people working in companies with a wastewater treatment plant for reducing the limits of emission are unaware of its existence and the effect that it produces because this isn't explained to them. Only one or two people know what it is to have to overcome pollution episodes that go 'through the roof' in terms of limits.

If there is a problem in the company of grease emissions into the waste water and it is a question of convincing the people who clean the grease off of the machinery, it will be much more graphic and effective to show them the remains of grease deposited in situ at the bottom of the waste water deposit that to give a talk about it.

A guided visit to the installation with a group who we want to transmit certain GHPs to could consist of the following:

1. Give a brief explanation of the itinerary and ask everybody to see things, not as they know how to do them habitually but by thinking of how the things that they are seeing affect the environment and if their performance could in some way cause less impact.
2. Following this, situate the group in the different points selected, such as the waste water treatment plant, the waste bin, the chimney where the air from the pneumatic carriage goes outside, and the electricity meter.
3. At each place, describe as realistically as possible the effect of each of the different operations carried out by the people in the group at the place in question, and how they could be improved by applying the GHPs of the Programme at this particular spot.
4. Finally, it can be useful to get them to ask questions about specific operations done by the workers and to answer by explaining how they are affected.
5. As a conclusion, it would be good at each point to give them information, photographs and/or data on the consequences of the impact on the environment outside of the company (metal pollution in the river, the contamination of aquifers, unpleasant smells for people living nearby, acid rain, etc.)

The people doing the training obviously need practical knowledge at each point that they visit.

TIME 3 TOOL 3	EXAMPLES OF SUPPORT MATERIALS	T 3 T 3

There is a series of specific materials that can be used to support the development of Good Housekeeping Practices in industry. They are as follows:

a) Materials that are for being distributed in different places around the company that remind people of the messages of the Programme. There are two types:

- Posters: which include a summary of the Good Practices to be implemented (see figure A1.8.).
- Stickers: one for each Good Practice. They are put up in the places where the practice described is usually done (see figure A1.9.).

Figure A1.8. Poster for the Good Housekeeping Practices Pilot Campaign carried out in Catalonia

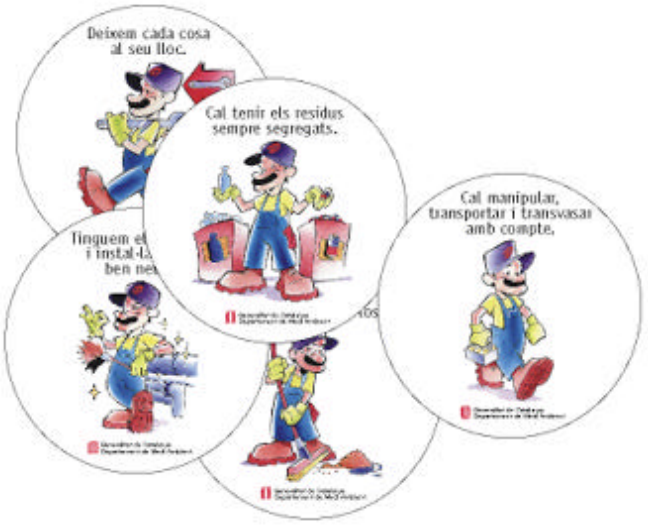


Figure A1.9. Stickers for the Good Housekeeping Practices Pilot Campaign carried out in Catalonia

b) Materials for the executives: Each Good Practice has a dossier where the problems are described, together with the Good Practices to be applied, and where suggestions are made for the plant personnel and the managerial staff. (See figure A1.10.)

Figure A1.10. Materials for managers from the Good Housekeeping Practices Pilot Campaign carried out in Catalonia

c) Materials for the workers: Booklets where the main message of each Good Housekeeping Practice is presented with a story in comic form. (See figure A1.11.)

Figure A1.11. Materials for workers from the Good Housekeeping Practices Pilot Campaign carried out in Catalonia

TIME 3
TOOL 4

GRAPHIC SIGNS AROUND THE PLANT

T 3
T 4

When it comes down to it, the time for going over everything in the GHP Programme means that between one to two intensive hours are spent in training each person. During this process, new ideas are transmitted that will aim to modify habits that have been deep-rooted for years and that in the majority of cases are more convenient for people than those that you are seeking to implement.

It is obvious that planning frequent training actions to go over the same thing time and time again will produce rejection on the part of the recipients. A very effective alternative, if used rationally, is to put specific, visually attractive signs around the plant to reinforce the GHPs that have been imparted during the training.

Doing this rationally is a question in general of the following criteria:

1. In corridors, refer to the current GHP Programme, by encouraging people's participation for the benefit of the environment.
2. In the specific areas, or those related to each group (areas near machinery, counter windows in the plant, the walls, planning notice boards, etc.), include precise messages that refer to specific GHPs.

The materials described in tool T3 may well be very suitable, with the posters as general material and the stickers for specific messages.

Other, more sophisticated possibilities include the readily-available use of electronic support devices and signs for making presentations instead of paper, and television and video, if available, and the familiar screen-saver on the computer screen also offer interesting possibilities.

TIME 3 TOOL 5	IMAGES: PHOTOGRAPHS, SLIDES, FILM FOOTAGE	T 3 T 5

“An image is worth more than a thousand words” is a maxim that is clear to everybody and that should be borne in mind when transmitting an idea. The use of visual material such as photographs, slides, scans or video for giving examples is always more useful than description, although one should not abuse of their use.

For example, when explaining the environmental impact of a landfill site, it could be interesting to show a sequence lasting a couple of minutes of an ordinary waste dump from a TV programme or video that the company managing the site has authorised you to film. For describing selective collection systems, you could take photographs of different containers with how they are labelled and a description of what has to be put in each one.

As well as being a useful tool for making descriptions, a picture catches the eye and can help change the rhythm of a presentation so that it doesn't become monotonous (especially if one has little experience in giving talks).

In trainings, where the participants are physically present, highly useful visual elements that are normally used are the blackboard/paper-board and slides/projectors. They serve the same function of distracting the attention of those present from the trainer to the image by changing the rhythm of the talk. At the same time, the image or picture serves as a more precise means of description than words.

The pictures to use in training actions have to be simple, clear, legible in case there is any lettering, and they must catch the participants' attention.

An example of a slide for illustrating a GHP is that appearing in figure A1.12. The slide firstly throws what is a real situation into relief: an oil leak. Then, what the impact that it causes on the environment: environmental impact is. And finally, what the GHPs that can reduce or totally eradicate it are.

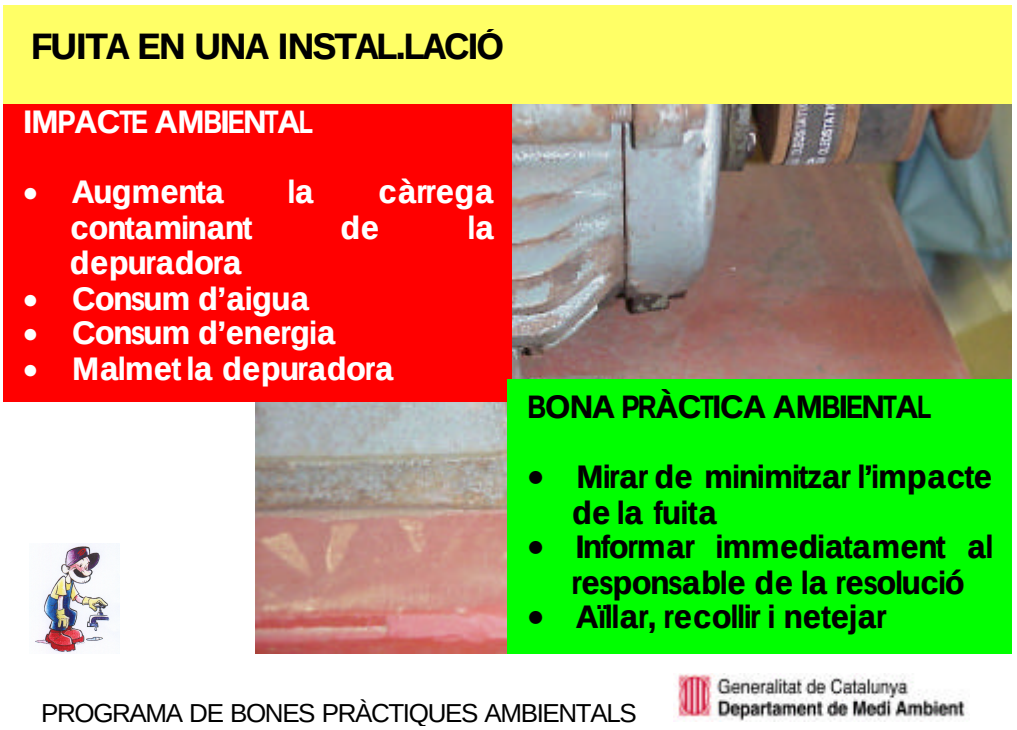


Figure A1.12. Slide used in a training action in the Pilot Campaign carried out in Catalonia

TIME 3 TOOL 6	DISCUSSION *WHAT HAPPENS IF …*	T 3 T 6

Convincing someone to practice a GHP is much more difficult than winning them over and it is only possible in the first place if you can convince the other person of what convinces you enough to practice it, i.e. the consequences.

This tool (see figure A1.13.), that can form part of both the presentation to the participants and the summary, can be used as a way of visually presenting the different ways of eliminating the different kinds of waste generated in the company. Each row and column are used to show what happens if each type of waste is incorrectly classified or if an effluent is eliminated in the wrong way. As can be seen in the example, it is useful to mention both the extreme consequences and the more immediate ones. For example, in the case of the elimination of waste with organic remains in water, the immediate outcome could be a malfunction in the waste water treatment plant or exceeding the waste disposal limits, with an extreme consequence of the eutrophication of coastal waters and the sea.

WHAT HAPPENS if waste is disposed of in the wrong way

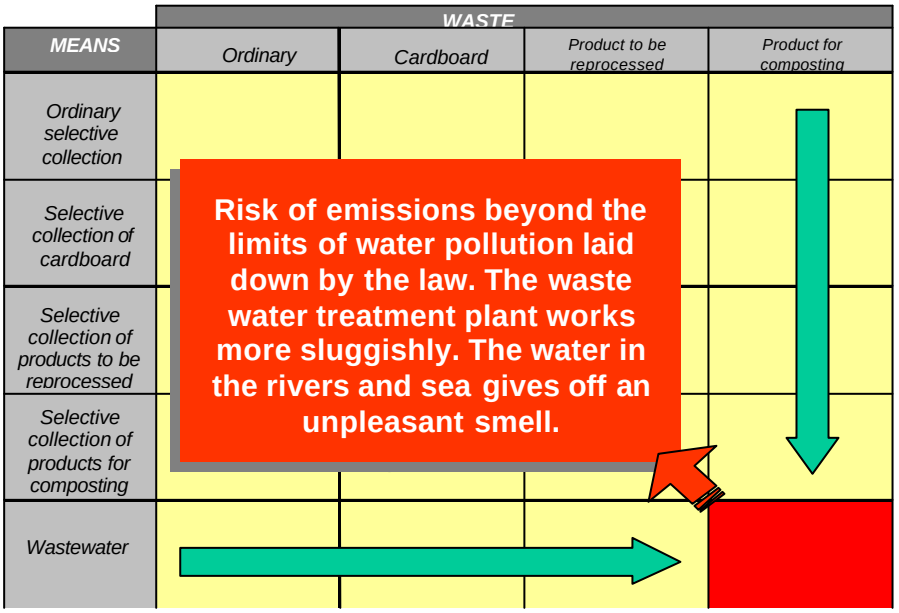


Figure A1.13. Table: What happens if….

TIME 3 TOOL 7	**PROCESS-IMPACT DIAGRAM**	**T 3** **T 7**

One of the keys to the efficiency of industry compared with craft techniques is the specialisation of operations and of the workers. This benefit means that people in the chain of operations that makes up the industrial process often don't know anything about it beyond their own particular assigned operation.

The process-impact diagram (see figure A1.14.) seeks in a very general way to enhance the team-spirit amongst everybody in the company for they can all see that the things they do get reflected there, as well as seeing what the results of their activities are in terms of the environment.

As with the table in *what happens if*… this tool can be valid both for the training actions and as part of the summary for the participants.

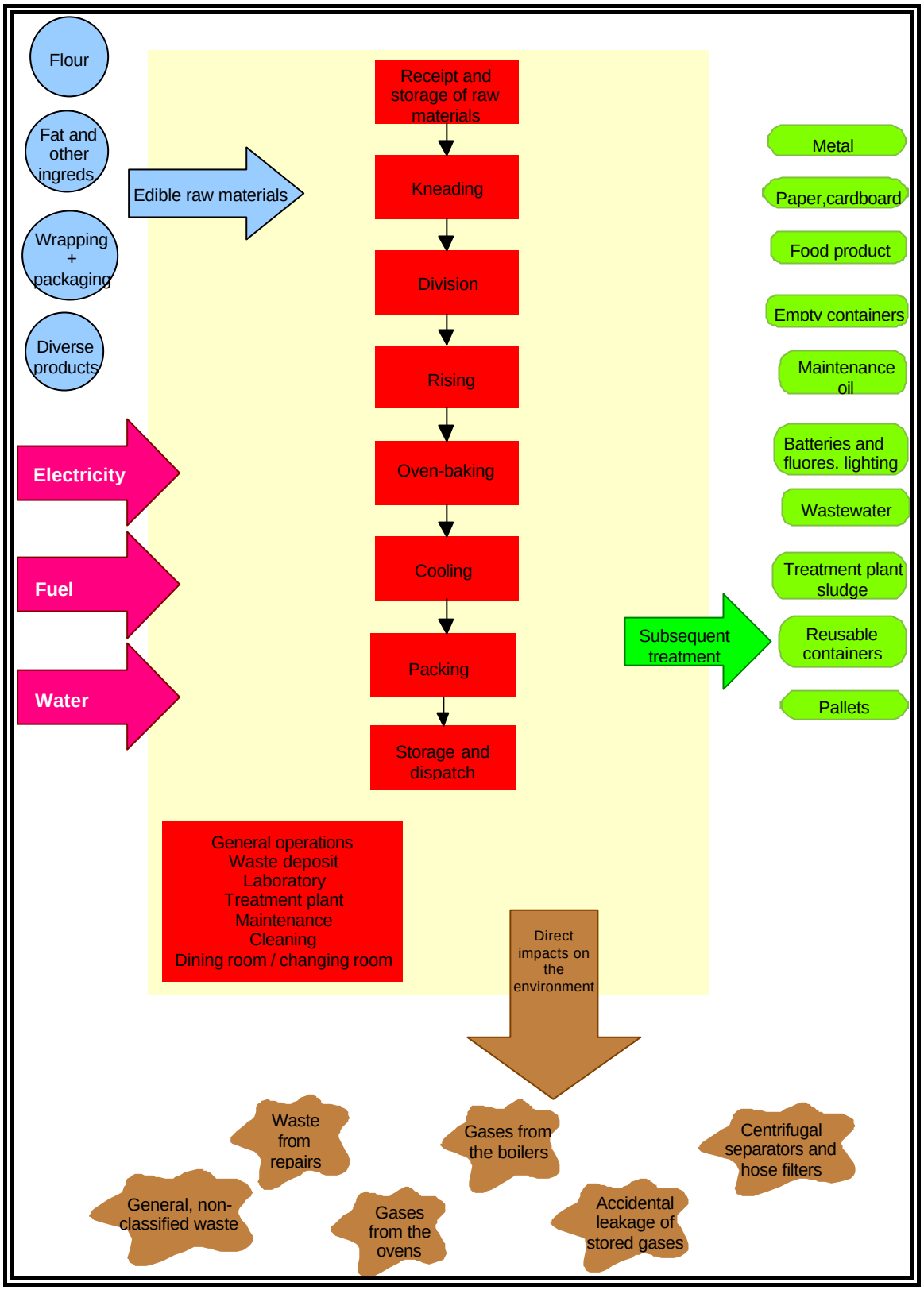


Figure A1.14. An example of a process-impact diagram

TIME 3 TOOL 8	COMPARISONS WITH THE HOME	T 3 T 8

In our daily lives, we are exposed to increasing pressure from the mass media, advertising campaigns and above all, the neighbours to behave in a way that has less impact on the environment, especially compared to ten years ago.

Sociological studies show that society is becoming more and more aware of the environment and that its environmental behaviour is becoming more and more appropriate. Despite this, the present situation is such that people who go for a walk in the park on Sunday and who separate out home waste for the different garbage containers are the same ones who work on an assembly line and throw solvent down the drain because that is what they have always done. This fact gives us an opportunity to make people think about the differences between their industrial and civic habits and to appeal to their sense of individual responsibility.

HOME	INDUSTRIAL
• Put the maximum amount of food remaining on the plate into the garbage before washing the plate.	• Reduce the amount of material stuck to the equipment before cleaning it.
• Classify and dispose of the different types of waste in accordance with the municipal system of selective collection.	• Separate the waste according to its physical and chemical characteristics.
• Use the bags that are given away in shops more than just once.	• Encourage the re-use of packaging material.
• Periodically check the car in accordance with the user's handbook.	• Define specific maintenance procedures team/shift according to their characteristics and circumstances.
• Install windows and doors that prevent heat escaping during the winter.	• Lag piping and tanks that contain hot fluids.

Table A1.2. Table of domestic habits and industrial habits

By using examples in the training actions from situations at home, a bond is created between both types of behaviour and a synergistic effect produced between the external campaigns in industry and the in-house GHP Programmes.

TIME 3 TOOL 9	SUPPORT MATERIALS	T 3 T 9

Support materials are a very important element in that they perpetuate the training actions over time. People keep the pamphlets and booklets that are handed out after doing a course or listening to a talk, so this is a good way for people retain the information.

Support materials can be very varied though they will depend a lot on the graphic and printing resources available. With the use of the minimum amount of resources, however, it is possible to produce highly successful material.

Support materials for the GHPs trainings have to be simple, they need to catch people's attention and above all emphasise the messages of the Good Housekeeping Practices that are being transmitted.

Examples of these materials are given in point T3 in this appendix 1.

TIME 3 TOOL 10	GUIDELINES FOR SPEAKING IN PUBLIC	T 3 T 10

Marcus Tullius Cicero (106 BC - 43 BC), the most learned man of antiquity, and lawyer and magistrate in Rome at the time of Julius Ceasar, wrote on the orator:

The orator speaks in such a way that he deals with the same matter various times and ends on same thought; that he often understates or ridicules something; that he goes off the subject; that he announces what he's going to say; that when he has finished dealing with a subject, he defines it; that he makes an effort to come back to the subject; that he repeats himself; that he ends his line of argument with logical reasoning; that he asks questions; that he answers himself; that he wants to put over something and he misconstrues himself; that he doubts about what he is saying and how to say it; that he divides into parts; that he leaves some things out; that he anticipates himself; that he blames his adversary for that which he is being reproached; that he deliberates often on those who are listening to him and even on his adversary; that he describes the customs and conversations of men; that he often makes his audience laugh; that he anticipates in refutation; that he uses comparisons and examples; (…) that he expresses good wishes; that he curses; that he makes the auditorium his friend. It is through this ensemble of resources that the greatness of eloquence should shine.

TIME 4
TOOL 1

IS IT NECESSARY TO MEASURE? HOW PRECISELY?

Taking measurements always involves making an effort. Because measuring involves making an effort, many people consider it to be unnecessary because they can get an idea of the situation just from asking one or two people for their opinions, and this enables them to make decisions. This strategy is good enough whilst they get things right but if they do things this way and don't get them right, then they only find out when it's too late to react.

Taking measurements serves to control and improve processes and operations. If no measurements are taken, it is impossible to get accurate information about a particular situation and the more complex that this is, the greater will be the necessity for taking measurements.

Taking measurements serves above all for communicating results without the speaker having to experience doubt about what he/she is presenting.

The effort to take measurements is greater when these have to be more precise. Moreover, if extreme precision is required, the necessary effort may be infinite. Bearing this in mind, the GHPP Co-ordinator will basically need to rely on the following when defining the indicators:

- The current data available in the company,
- The economic resources and the measuring equipment that the company has,
- The work of the person who is entrusted with the measurements, and
- That the resultant indicator is representative of something.

One strategy for defining useful and attainable indicators is:

1. Think of the best indicator that you know of.
2. Check if there are available resources for obtaining it.

- If the answer is YES, implement it.
- If the answer is NO, go back to 1. and think of a simpler indicator.

Industry is very accustomed to indicators for controlling quality, safety and profit but not so in the case of the environment. Just as when learning to walk, one has to go bit by bit but without relinquishing the idea of doing it well.

TIME 4 TOOL 2	INDICATORS OF THE EFFECTIVENESS OF THE GHP PROGRAMME	T 4 T 2

The measures to be carried out and the indicators to be established are a direct consequence of the goal to be achieved. The goal of the GHP Programme is to comply with the established General Plan for the Protection of the Environment. By analysing if it complies with that which is envisaged in the Plan, the effectiveness of the GHP Programme can thus be verified.

In the following section, various different indicators are prepared which can be formulated for different types of industrial activities with different GHPs.

CASE A

A chemical processing industry that uses discontinuous reactors for producing surface-active paste mixtures. The GHP that has been established consists of pressurising the reactor and piping to 3 Kg/cm^2 and letting the air circulate for 5 minutes before the following production to eliminate the maximum amount of product from the circuit. Cleaning with water is carried out afterwards.

Habit indicator

The compressor that serves the line is the only one that is used for scavenging (1). The number of product changes appears in the daily production report made by the charge-hand (2).

The habit indicator could be:

$$\textbf{Compressor minutes per change} = \frac{\textbf{Difference weekly compressor reading (1)}}{\textbf{No. of changes per week (2)}}$$

By controlling how much air is consumed, it will be possible to know if the GHP is being carried out or not.

Results indicator

This is the only process in the plant that increases the conductivity of the water. There is a conductimeter in the laboratory.

The indicator for efficiency could be:

$$\text{Weekly Conductivity average} = \frac{\text{Conduct.}_{\text{Mon}} + \text{conduct.}_{\text{Tues}} + \ldots + \text{Conduct.}_{\text{Fri}}}{5}$$

A lab analyst would do the measurement for conductivity by taking a sample from the homogenisation tank. In this case, 3 data collection sheets would be needed:

- **Analyst**

MEASUREMENT OF THE CONDUCTIVITY IN THE HOMOGENISER

Date	Monday	Tuesday	Wednesday	Thursday	Friday

(…)

Hand in the completed sheet by…

- **Head of maintenance**

REACTOR COMPRESSOR METER

Week Present reading Difference

(…)

Hand in the completed sheet by…

- **Production charge-hand**

No. OF CHANGES IN THE REACTOR

Week	Monday	Tuesday	Wednesday	Thursday	Friday	Total

(…)

Hand in the completed sheet by…

CASE B

A plastic injection company that has a manual adjustment system for the different conditions of the extrusioner that normally results in a lot of manufactured parts being thrown away in subsequent phases due to defects caused on start-up. The GHP that has been established is as follows:

a) Adjust the machine,
b) Wait for the conditions to stabilise,
c) Do a run of 10 units,
d) Check the defects and, if there are none, continue. If not, readjust the machine at once.

Habit indicator

In the production report, there is usually a box for the time change. The indicator could be:

$$\text{Average time change} = \frac{\text{Weekly time changes}}{\text{No. of changes}}$$

Results indicator

After the injection process, there is a section that assembles a switch onto a piece of plastic. The parts that don't fit return to the injection section to be melted and reprocessed. Here, the indicators could be defined as:

- Kg of faulty parts per week
- Energy consumption in the injection section

In this case, the GHPP Co-ordinator will get the information for the average time change from the reports. The person in charge of the assembly section could give him the number of faulty parts per week by weighing the material. The person in charge of maintenance would give him the kW consumed in the section, for he has access to an automatic consumption meter on each process line.

CASE C

A company in the foodstuffs sector that has a continuous raw material cleaning system with a manually controlled bleed. There are 3 shifts on the line.

Habit indicator

After each shift, the line charge-hand takes a sample to the laboratory.

$$\text{\% dirt per shift} = \frac{\text{Reading of the turbidimeter each shift}}{\text{Maximum turbidimeter reading allowed for solution}}$$

This indicator shows whether the cleaning of the solution is being done according to the GHP or if the water is excessively clean.

Results indicator

To get the information, a meter is put on the line water inlet and the charge-hand asked to note down the reading in the daily production report, together with the Kgs produced.

$$\text{Water consumption per Kg of product} = \frac{\text{Daily meter reading}}{\text{Kgs produced daily}}$$

TIME 4

TOOL 3

COMMUNICATING THE RESULTS

As was seen before, it doesn't make any sense if the measurements taken do not give us the information that tells us if things are going well or that improvements need to be made. But neither does it make any sense having this information and not communicating it to all of the people that need to know about it so that improvements can be made. You should also bear in mind that when you are communicating results, you need to know who you are communicating them to. As the idea is for the results to reach everybody in the company, the indicator results should thus be shown as simply as possible.

The indicators to be presented are in general of two types:

a) Absolute value

b) Percentages

The absolute value normally obtained will be in relation to the absolute reference or goal that we want to achieve. It is recommendable to give both pieces of data when transmitting this information so that it remains clear that improvement can still be made.

With percentages, the most visual way of representing them is in a pie chart. Taking the indicator in section 4.2. of chapter 4 where the maintenance activities were being considered, let's say that 20% were done during January (see figure A1.15.).

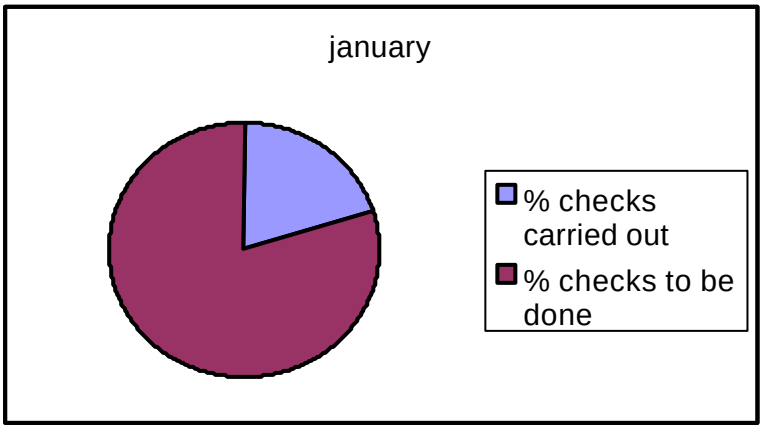


Figure A1.15. Representation using a pie chart

It can often be interesting to give both the specific value for a period and the change of the value over time. To minimise the effort of taking measurements, plus the fact that the results for habits are often seen over a medium or long term period, one month may be sufficient as a co-ordinate of time in environmental management. The best way of indicating percentages over a time scale is with a bar chart (see figure A1.16). The diagram shows the evolution of the values over a year for the same indicator used in the pie chart.

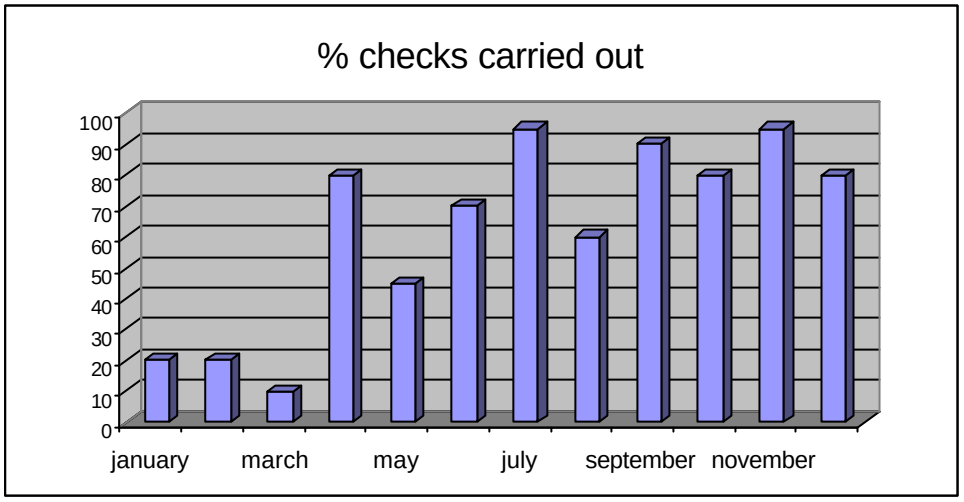


Figure A1.16. Representation using a bar chart

With an absolute value, the most appropriate way is with a trend graph, as in Figure A1.17, which gives the daily use of water per product Kg. for case C.

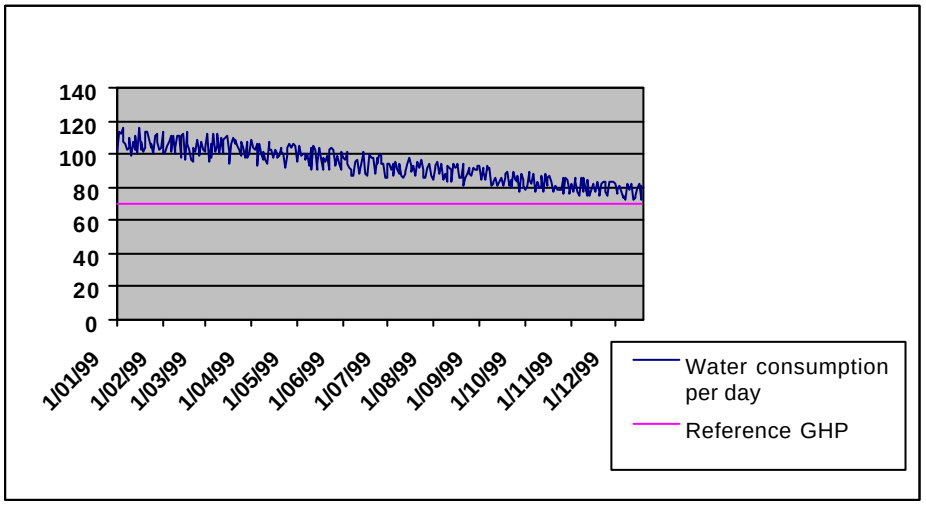


Figure A1.17. Representation using a trend graph

APPENDIX 2: FORMS

TIME 1 FORMS	INDEX	T 1 F O

F1. ENVIRONMENTAL PROFILE AND PROPOSALS FOR REDUCING THE ENVIRONMENTAL IMPACT

TIME 2 FORMS	ÍNDEX	T 2 F 0

[company]	CODE:
GENERAL PLAN FOR THE PROTECTION OF THE ENVIRONMENT	OPERATION:

	Goal 1	Goal 2	Goal 3
DEFINITION OF THE GOAL			
NECESSARY INSTALLATIONS AND TOOLS			
GOOD HOUSEKEEPING PRACTICE			
PERSON IN CHARGE OF THE GOOD HOUSEKEEPING PRACTICE			
CONTROL			
PERSON IN CHARGE OF CONTROL			
CONTROL RECORD			
ACCEPTABLE LIMITS			
CORRECTIVE MEASURES			
PERSON IN CHARGE OF DECIDING THE CORRECTIVE MEASURES			
CORRECTIVE MEASURES RECORD			

T 2

F 2

[COMPANY]

GOOD HOUSEKEEPING PRACTICES PROGRAMME

From _____ to _____

Nº of GHP	**Description**	**Related goals (nº EG)**

TIME 3 FORMS	ÍNDEX

T 3

F 1

TRAINING ACTION PLAN OF THE GHP PROGRAMME. Year _____

No.	Name of the action	Brief description of contents	Recipient group	No. of participants	Means used	Trainer	Cost	Month

T 3

F 2

TRAINING ACTION GUIDE

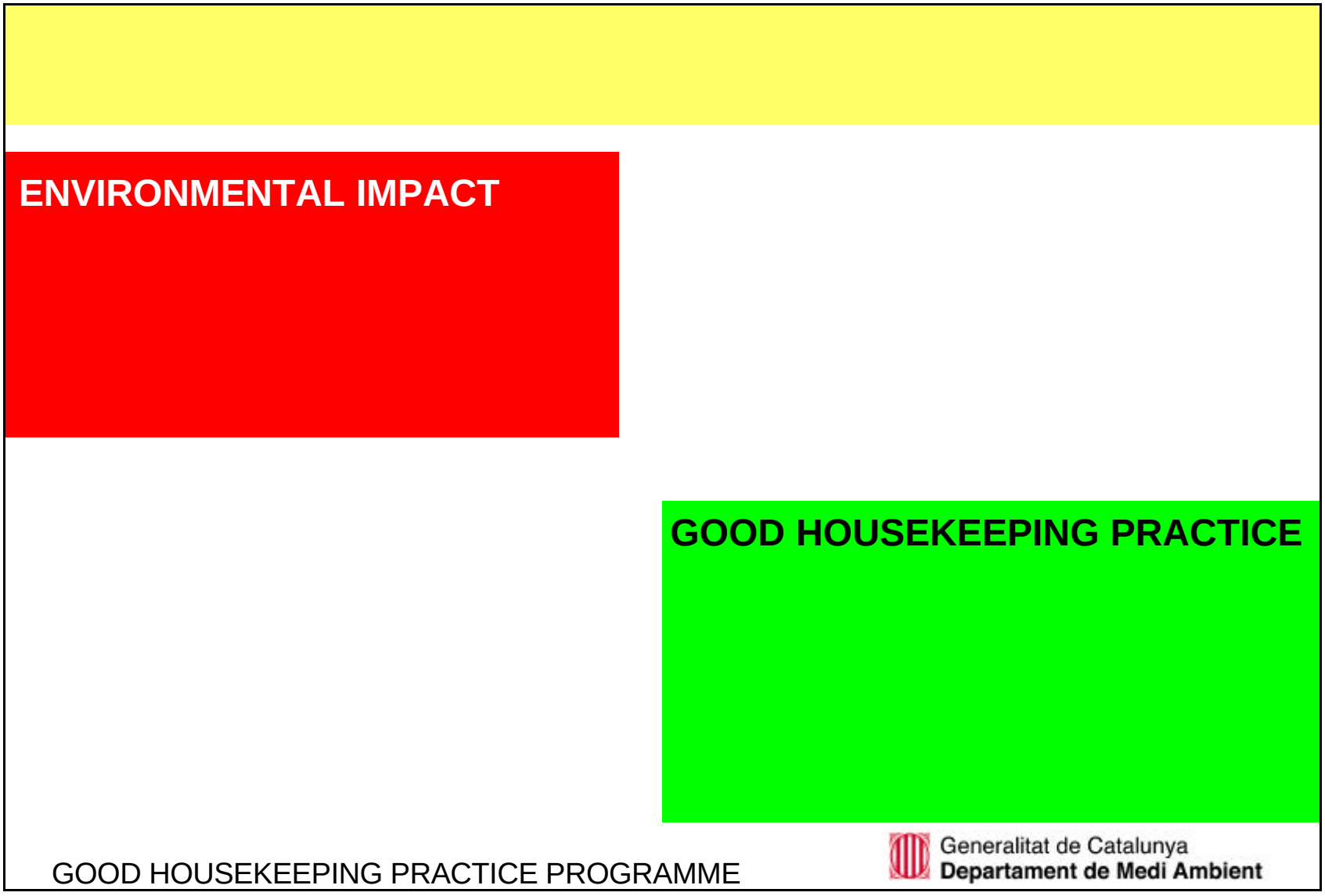
Name: _____

Projected date: _____

	n	Subject	Content	Manual	Presentation	Specific time	Accumulated time
0	0	**Presentation**					
0	1						
0	2						
0	3						
A	0	**GHP nº1**					
A	1						
A	2						
A	3						
A	4						
	P		**BREAK**				
B	0	**GHP nº2**					
B	1						
B	2						
B	3						
B	4						
C	0	**Conclusion**					
C	1						
C	2						

T 3

F 3


ENVIRONMENTAL IMPACT
GOOD HOUSEKEEPING PRACTICE
GOOD HOUSEKEEPING PRACTICE PROGRAMME
Generalitat de Catalunya
Departament de Medi Ambient

T 3

F 4

COURSE ASSESSMENT QUESTIONNAIRE

Name of the course _____

Date taken _____

Read the following sentences carefully and circle the corresponding number according to the following criterion: (5 = totally agree / 1 = totally disagree).

COURSE CONTENTS					
• They have been suitable for my requirements	❺	❹	❸	❷	❶
• It has provided me with new knowledge or broadened that which I already had	❺	❹	❸	❷	❶
• I will make use/will be able to practically apply the knowledge I have acquired	❺	❹	❸	❷	❶
METHODOLOGY					
• I am satisfied with how long the course is	❺	❹	❸	❷	❶
• The practical part of the course is sufficient and satisfactory	❺	❹	❸	❷	❶
• The installations and the means have been appropriate	❺	❹	❸	❷	❶
• There was the right number of participants in the group	❺	❹	❸	❷	❶
SPEAKERS					
• The choice of speaker/s was satisfactory	❺	❹	❸	❷	❶
• Direct, open communication was encouraged between the participants and speakers	❺	❹	❸	❷	❶
• My opinion of the performance of the speaker/s is positive	❺	❹	❸	❷	❶
DOCUMENTATION AND TEACHING MATERIALS					
• I consider that the documentation and materials that I received in this course were adequate	❺	❹	❸	❷	❶

ADDITIONAL COMMENTS

APPENDIX 3: SPECIFIC ENVIRONMENTAL DATA CONCERNING INDUSTRY

- **Taps, stopcocks and similar devices** can cause resources (water) and raw materials to be wasted if they are unnecessarily left open or if there are leakages. A tap with a 12 mm jet can lose up to 850,000 litres of water a month. One drop of oil can pollute 5,000 litres of water.

- **The mixing of different types of waste** generated in an industrial activity reduces its potential of being recycled and recovered, with the resulting wastage of materials and the increase in cost of waste management. Two different types of waste that could be recycled separately become waste that is more expensive to treat when joined together.

- **A stores location with excessive stock or that is disorganised** is a potential source of waste generation, either because of the expiry of stock or because of the increased risk of breakages and spillage of the stored products. The policy of buying large lots at low prices can encourage the generation of expired materials that generate waste.

- **The maintenance, transportation or deficient handling of products** can also produce losses, spillage and the generation of waste, together with the added cost of corrective measures on the generated environmental impact.

APPENDIX 4: BIBLIOGRAPHY OF INTEREST

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