

A FRAMEWORK FOR ESTABLISHING AIR QUALITY OBJECTIVES AND TARGETS AS PART OF AN ISO 14001 PROGRAMME

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1. INTRODUCTION

Managers with the responsibility of implementing and maintaining an Environmental Management system, compliant with ISO 14001, are required to set objectives and targets for improving environmental performance. When it comes to air quality objectives, it is not unusual for managers to experience difficulties in establishing objectives that have both meaning for the organisation, and broad-based support within the management team.

Reasons for this include factors such as the uncertainty regarding what is realistic, the relative absence of legislated emission standards, and the costs associated with monitoring performance.

The purpose of this paper is to provide environmental managers with practical guidelines for setting air quality objectives and targets within industrial settings.

2. INDUSTRIAL EMISSIONS

Industrial air emissions vary according to their origin as well as their physical and chemical properties. Some of the characteristics of industrial air pollutants that are of importance in the setting of objectives and targets are briefly outlined in this section.

Point source emissions are those released in high concentrations at one location, for example stacks and ovens¹. Non-point source emissions include planar sources, for example a number of small sources such as leaking pipes and fittings, and linear sources, such as a street with high traffic volumes. The physical distribution of emission sources influences the way in which emissions can be monitored. With point source emissions, it may be possible to install dedicated monitoring systems that, for example, optimise combustion processes through direct feedback into process settings. On the other hand, non-point sources may require the use of long-path photometry to obtain an average concentration over the site.

In cases where there is good correlation between

the input materials and the resulting emissions, it is usually simpler and more accurate to monitor the consumption of input materials, e.g. organic solvents in paints and sulphur content in fuels.

The frequency of incidents or events for highly visible or odorous emissions may be an appropriate and affordable means of monitoring improvement if the emissions are mainly of nuisance value. The monitoring of complaint registers is generally discouraged due to inconsistency.

3. SETTING OBJECTIVES AND TARGETS

The Initial Review, conducted at the start of the planning stage of ISO 14001 implementation, provides a major source of information for the setting of objectives. Environmental aspects, including those relating to air quality, and the factors that contribute to their significance, are all identified and recorded during this process.

Factors that must be considered when selecting which of these aspects require specific objectives and targets, includes their significance, business considerations, technological options, and the views of interested parties. The rating of each aspect according to these criteria, in a similar manner to the determination of significance, can then be used to prioritise which of the aspects require specific objectives and targets. This process should result in a large reduction in the number of aspects to be addressed and a focus on those objectives and targets that will be the most productive for the environment and the organisation.

The organisation is then in a position to set objectives. The properties of good objectives and targets are described in most texts for designing projects. For objectives to be effective in driving continual improvement they should meet the requirements of SMART objectives, as described below.

Specific: The objective specifies precisely what must be achieved.

Measurable: An objective measure is essential to evaluate whether the objective has been reached.

Achievable: The objective should be something that your organisation can accomplish.

Realistic: The objective should be practical in terms of the time frame and resources that are available.

Timebound: The objective must be tied to a specific time frame.

The written objective should include the action that will be performed, how it will be achieved, and the time period by which it will be completed.

The description for the action to be performed should include verbs that describe a behaviour, a skill, or a change in the environment ². Precise words include:

- Construct
- Locate
- Participate
- Reduce

Words to avoid include:

- Develop
- Encourage
- Enhance

Although an overall goal may be to conserve the environment, it would be difficult to measure success of such a target. These kinds of words are often used in overall mission statements for organisations, but are not effective as words in a SMART objective.

4. OBTAINING COMMITMENT

For the improvement programme to be successful managers with the responsibility for allocating resources to the programme must perceive the targets to be both realistic and necessary. The environmental manager's role is to establish the need for change, and provide a technical or legal justification for the targets. However, it is rare that all managers will, at least initially, find the targets achievable, and a process of obtaining buy-in is therefore necessary.

A useful framework for determining the level of participation in decision-making is the leader participation model proposed by Victor Vroom and Phillip Yeton and revised by Arthur Jago ³. The model provides a set of rules to determine the amount and form of participative decisionmaking that should be encouraged in different situations. Recognising that tasks can be ³ either structured or unstructured, the researchers suggested that the leader's behaviours be adjusted to the task structure.

The model suggests that the effectiveness of a decision is gauged both by its technical quality and its acceptance. According to the model, to arrive at the best decision a leader needs to analyse the situation and then choose a decision-making style from two autocratic styles (AI and AII), two consultative styles (CI and CII), and one group style (GII). These styles are summarised in Table 1 ⁴.

Table 1: Decision-Making Styles According to the Leader-Participation Model ⁴

Decision Style	Definition
AI	Leader makes the decision alone
AII	Leader asks for information from team members but makes the decision alone. Team members may or may not be informed as to what the situation is.
CI	Leader shares the situation with each team member and asks for information and evaluation. Team members do not meet as a team, and the leader alone makes the decision.
CII	Leader and team members meet as a team to discuss the situation, but the leader makes the decision.
GII	Leader and team members meet as a team to discuss the situation, and the team makes the decision.

SOURCE: V.H. Vroom and P.W. Yetton. *Leadership and Decision-making*. Pittsburgh: University of Pittsburgh Press, 1973 as quoted in Hellriegel et. al.

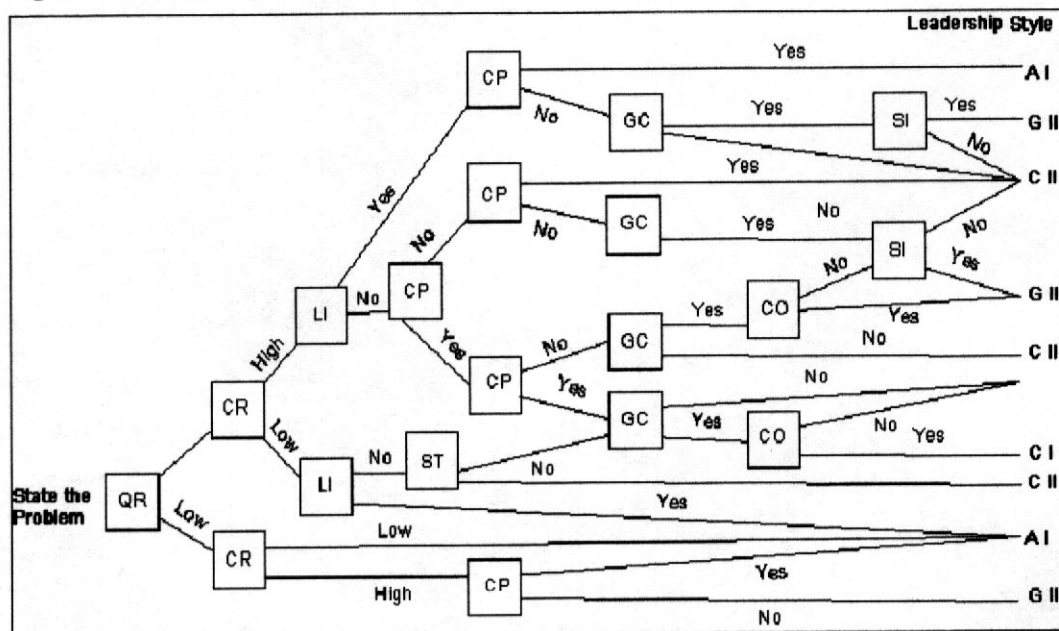
The leader's analysis is guided by eight contingency questions, which must be answered in the order they are presented in Table 2. The answer to each question guides the leader through the Vroom-Jago decision tree (see Figure 1). The leadership style chosen should lead to the highest quality decision that will be accepted by subordinates.

Table 2: Vroom-Jago Decision Tree Questions

	Problem Attributes	Question
QR	Quality requirement	How important is the technical quality of this decision?
CR	Commitment requirement	How important is subordinate commitment to the decision?
LI	Leader's information	Do you have sufficient information to make a high quality decision?
PS	Problem structure	Is the problem well structured?
CP	Commitment probability	If you were to take the decision by yourself, is it reasonably certain that your subordinate(s) would be committed to the decision?
GC	Goal congruence	Do subordinates share the organisational goals to be attained in solving the problem?
CO	Subordinate conflict	Is conflict among subordinates over preferred solutions likely?
SI	Subordinate information	Do subordinates have sufficient information to make a high quality decision?

SOURCE: V.H. Vroom and A.G. Jago. The New Leadership: Managing Participation in Organisations. Englewood Cliffs, N.J.: Prentice-Hall, 1988, as quoted in Hellriegel et. al.

Figure 1: Vroom-Jago Decision Tree ⁴



The model provides an excellent guide for determining the type and degree of participation in decision-making. While the leadership role can be assumed by the environmental manager, more weight is given to the decision, specifically in cases of autocratic decisions, if the manager to whom the team reports, assumes this role. Leaders use participation when the quality of the decision is important, when subordinates should accept the decision and they are unlikely to do so unless they are allowed to have some say in it, and when subordinates can be trusted to strive for organisational rather than individual goals.

5. CONCLUSION

Ensuring the commitment of managers who will have the responsibility of completing tasks in terms of the environmental management programme is key to ensuring that continual improvement targets are met. A structured approach with an appropriate level participation in

the setting of objectives and targets is a major contributory factor for the successful implementation of ISO 14001.

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