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VIII. FEEDBACK AND ADJUSTEMENT

1. Assessment of Effectiveness of Rehabilitation

This assessment is based on a re-evaluation of facts.

- In time

Rehabilitation implies an iterative process in a dynamic manner throughout the rehabilitation operation. Thus the committee responsible must have some considerable measure of continuity to supervise the rehabilitation operation from start to finish. This involves the re-evaluation of strategies and plan in the light of new information.

- In space

The contaminated area may change, thus necessitating changes in the action procedures (adjacent areas, water infiltration problems, displacement populations).

Re-assessment implies a continuous decision making process capable of synthesizing the past events and using new information to continuously develop strategies for the future as the programme evolves.

The process should consider all the dimensions of the problem. Not only the technical, methodological and scientific aspects, but also all the psychological, social, economic and even political components, which are often of significant importance in developing action plans and relevant modifications.

Readjustment of rehabilitation procedures is a complex, dynmamic, stepwise process to develop an active strategy, to speed up the evolutionary process towards the final solution.

1.1 Methodology

The readjustment of the action plan implies that it is executed as quickly and precisely as possible. Methodology is therefore of paramount importance. The diversity of the actions involved requires a multifactorial strategy, to integrate all results in new actions. This requires persons skilled in such methodology (evaluation techniques in toxicology, epidemiology, statistics, etc.). The Committee charged with this responsibility should continuously secure advice of experts using reference indicators for its decisions (for example, authorizing the return of the populations or of domestic animals).

The objectives and goals should be continuously refined to ensure that the action plan remains clear.

Time spent in redefining problems and their solutions is seldom wasted when the discussion leads to a practical step.

1.2 Coordination

The adaptation of procedures as a function of new data derived from accumulated results should take into account many aspects of the situation. A medical procedure, for example, may be ineffective, if not combined with other actions on the surrounding natural reservoirs.

Each expert, being particularly sensible to his own criteria, may try to influence the overall action plan which could also prove prejudicial. It is therefore clear that some identifiable body should control the overall strategy, whilst being fully aware of the possibilities afforded by alternative strategies. Effective coordination is essential.

1.3 Decision making

Any new decisions taken during rehabilitation requires some modifications of the works carried out by the rehabilitation teams.

This implies the presence of some centralized control mechanisms ordering the work of the different work groups. Some decisions are difficult (for example, the majority of indicators may appear to be favourable while some of them may be dubious), the non-scientific requirements (for example, strict economic constraints) will usually make it necessary to adopt a "best practical solution".

1.4 Team or Staff Modifications

The organizational problems of the team may, at some stage, call for changes, because of:

- Loss of interest, weariness, or even of the abandonment of the project on the part of some specialists or individuals.

- Becoming so familiar with the toxic hazard that some persons return to the banned area without authority.

- Conversely, the appearance of new scientific, technical or economic interests diverting the interest of the rehabilitation team.

These observations, the reasons set forth in the preceding paragraphs (1.2, 1.3, and 1.4) suggest that the choice of team members to be replaced or added, should be based on 4 criteria:

- technical and methological skills;

- availability (they must be exempted, wholly or in part, from their customary duties), required to ensure continuity of action;

- decision making skills;

- ability to relate to other team members.

These qualities appear to be of paramount importance when comparing data and personnel in a system that is usually controlled in an imperfect manner and frequently involving some measure of confrontation.

The addition of provisional experts, charged with well-defined and limited duties, is always possible. These duties will have to be carefully defined and integrated into the framework of the overall strategy.

1.5 Responsibility

It should be clearly understood that continuity of responsibilities should be maintained throughout the entire rehabilitation programme. Any change in plan resulting from experience should be the responsibility of a single decision making authority.

The definition of survey duties, the choice of provisional experts, the recruitment of specialized teams, are the responsibility of the rehabilitation team. The final decision will be taken by the prescribed authority.

1.6 Budget Modifications

A provisional budget can never be really accurate for the entire rehabilitation program, and additional budgets may be necessary as the work proceeds.

Some authorized body must therefore consider the economic value to the community of each decision taken, including examination of protocols to limit costs. (For example, the threshold dosage of a toxic substance having been defined, it may be considered advisable to provide only notification of "higher" or "lower" than such limits, excepting perhaps samples taken for research purposes.

1.7 Interrelationships

1. 1 With local authorities

Some local authorities will have been represented during the emergency phase and their presence will continue until the rehabilitation program terminates.

It is desirable that the individuals involved remain the same. It is likewise desirable that there are not too many representatives and that those who are part of the working group report regularly on the progress of works to the various administrative organizations, at both the local and national level. Adequate authority must be provided for rapid implementation of the programme.

1.3.2 With Working Groups (Executing Groups)

Setting up working groups may be necessary, requiring a chosen leader, workplan, methodology and a time schedule. When the work is completed it will have to be assessed and integrated into the overall program.

The future of such groups must also be considered so that they do not prolong the work to remain employed. Meetings between the group leaders and the standing committee should be called as required.

1.3.3 With External Groups

The longer the rehabilitation times, the greater the number of private research initiatives that will develop, requiring ongoing liaison with such groups.

Private interest groups such as local or national associations, defense associations, consumer associations may suggest action plans. These requests must be examined. This feedback effect must not be minimized, for these groups usually have a powerful connection with the public. Such groups may provide greater insight into the distress of the population and suggest a therapy that the action plan might provide.

1.3.4 With the Public

The organization of relationships with the public cannot be excluded from the plan because the psychological and emotional state of the population are integral parts of the notion of health.

Two types of relationships must be involved in any feedback and adjustment process:

(a) the supply of information to the public, and
(b) the collection of the remarks made by the public.

This form of relationship may:

- Form the basis of a realistic and effective alarm system, arising from the accumulation of effects described by the public.

- Provide a "listening-post" for individual cases, providing considerable therapeutic value.

- Cause the public to become active and cooperative participants.

2 Declaration of Completion or Re-examination of Goals and Objectives

2.1 Re-evaluation in relation to the previous objectives

The re-assessment of the plan in the light of data acquired will be easier if the objectives were clearly defined and pursued. Effectiveness is therefore dependent upon the quality of the work carried out to date.

2.1.1 Updating Literature

Updating literature is a priority during the rehabilitation period.

The analysis of published data may identify the directly useful data and prevent useless and costly investments (for example, established toxicity thresholds - tested dosage methods, simplified investigation techniques, etc.).

Those charged with this analysis must again ensure continuity, comparing all data resulting from the experience.

2.1.2 Updating New Results

The rehabilitation team must be able to obtain continuously, intermediate results of studies, and results should be drawn up and reported periodically. They should compare the results with the objectives originally stated.

2.2 Emergence of New Facts

One of the difficulties of the feedback process is to ensure rigorous methodology complying strictly with the fixed objectives, yet allowing for unexpected or underestimated facts.

Any new facts justify examination. They may deal with:

- a new toxic substance, unrecognized so far by rehabilitation procedures: perhaps a newly-identified toxic metabolite, a secondary appearance of the initial toxic substance due to the presence of a reactive product.

- a new effect, not considered initially such as progressive neurological or hepatic attacks in humans or animals, or limited to certain populations, with pathologic responses not normally related to the toxic substance.

An appropriate recording structure for this information is essential for the feedback process to function effectively. It may be provided by "Toxicovigilance centres", if such exist, as their experience is already directed toward detecting such unusual cases.

Other form of epidemiological monitoring, based on systematized recording techniques of symptoms, may prove desirable. This structure will be charged with reporting to the committee all the new effects that may require modifications in the rehabilitation plan or its objectives.

2.3 Re-definitions of Priorities

A basic condition of effectiveness is to maintain defined objectives, some which will remain constant, regardless of the type of accident:

- The identification of the toxic substance (or substances), if it was not determined in the emergency stage, remains the higher priority.

- The epidemiological studies continuously re-evaluate the observed effects allowing the team to judge the effects of treatment, by comparing results through time. As a result, it may be possible to modify:

  - the samples of population or environments to be supervised, sampled or monitored

  - the definition of the areas and of the populations exposed to risk

  - the interpretation of the partial or limited results (in relation to the whole).

Priorities may likewise concern the choice of an area or place to be protected immediately (eg. water or food sources, vital economic production facilities, or an urban area). The choice of criteria and indicators is also of considerable importance.

Particular priorities may be related to the specific toxic substances according to new information, based on:

- evaluation of the available indicators
- accumulation of risk
- short-term, medium-term or long-term effects
- multiple etiology
- on single or multiple targets
- estimate of incidence, or rate
- satisfactory progress of the plan
- eruption of unexpected factors

2.4 Report on the Progress of Works

Reports should be regularly drafted on the progress of works, and the various decisions adopted. Such reports may consider the following:

- Routine internal reports,	the frequency of which will be dictated by the progress of works within the planning framework
- Press releases,	made either on the occasion of a routine report or for answering pressing questions (press campaigns, a new fact with a particular emotional importance for the population)
- Scientific publications	of special interest for the professional groups, and occasionally providing useful comments or criticisms
- Special reports,	meant for attracting the attention of various professional categories, who may have a responsiblity in the present or future situation (Mayors, members of first-aid associations, farmers, teachers, etc.).

Each major decision should be the subject of an internal report, providing data, including contradictions, ambiguities, and difficulties. The analysis of these data in the final stage (V 4.2) will then allow a re-evaluation of the various decisions taken.

3.0 Adjustment of Rehabilitation Plan

3.1 Time Schedule

3.1.1 Frequency of Meetings

The frequency of meetings may commenc at a high rate in the early stages gradually reducing as the rehabilitation programme is redefined as it proceeds. It is recommended that meetings be planned over a long period initially.

New facts may require special meetings.

3.1.2 Frequency of sampling and observations

Each specific programme of observations must be undertaken at a given time during the operations in order to be fully effective in the overall strategy. If it is carried out too early or too late, its value may be lost. Systematic sampling can often be recommended, with samples being preserved until the toxic substance is identified. This provides for the possibility of filling, "a posteriori", the gaps antecedent to the action plan, and affords a really effective feedback mechanism.

3.1.3 Monitoring

- Studies Underway

Research scientists are rarely ready to plan strategic action. It is thus necessary for the rehabilitation supervising authority to closely watch early monitoring, recognizing the need to take subsequent decision based on the results.

Unless intermediate results appear promising, it may be necessary to speed up the work.

- Additional Studies

Specialized skills may prove useful in some phases of the plan. The time schedules and objectives of the action should be outlined in a study outline, indicating repercussions of various possible conclusions (different foreseeable hypotheses).

These studies are often justified:

- to confirm a result, which is extremely important for the decision: a second opinion may prove advisable

- to validate any statistically questionable results

- to speed up rehabilitation procedures: for example, detoxification, following interesting but still insufficient results

- as a Result of New Facts.

The identification of a new toxic substance, or of a new effect (V 2.2) justifies the release, in the action plan, of new study protocols, first having confirmed its presence and then analyzing for it.

3.2 Evaluation of the Time Factor

Time itself may exert a spontaneous and real influence on the development of the plan. Natural detoxification if the biological metabolic chains of ecosystems are not immediately destroyed, lead towards rehabilitation. Similarly, atmospheric circumstances may play an important role (winds, rainfall, temperature). The time factor should therefore be considered very carefully.

3.3 Readjustment of Monitoring

The evolution of the situation justifies an adjustment, not only of the objectives or of the methods used, but also of the sampling network.

3.3.1 Restoration of environmental balance

The results obtained in one sector may modify another (e.g. the disapperance of the toxic substance from the water may allow a reduction of monitoring the animals, and may remove the need to monitor bordering areas.

3.3.2 Redefinition of affected areas

It was previously stated (Chap. IV) that a volatile toxic substance may move around according to the weather, or a soluble toxic substances may pollute watercourses, depending upon flow, doses, etc.

Monitoring may thus evolve if the affected area extends and creates further emergency situations, and further technical, social, emotional, or economic problems.

The participation of local representatives in limited numbers is desirable (and inevitable). There presence ensures local contributions.

The local geographical, ecological, and demographic conditions may require some modifications in monitoring probably requiring further programs.

There exists in some instances the possibility that fixation of the toxic substances on plant tissue (for example, Seveso) delays the spread of the contaminated territory.

The controlled area can be reduced as favourable results accumulate. This is the normal process accompanying most toxic events. The emergency having caused the delimitation of large calculated security areas, the rehabilitation plan should lead, after verification, to a gradual reduction of the damaged area.

3.3.3 Redefinition of indicators and parameters

Practical experience of disasters so far suggests that the experimental indicators identified early in the process should be subsequently modified. The main objectives of rehabilitation suggests that health indicators are the most significant parameters.

- positive parameters: dose response data for the chemical, for humans, various animals, fauna and the utilization of both animals and/or the flora, or any other biological indicators.

- negative parameters: the uselessness of certain checks, sampling procedures, observations, should be acknowledged and abandoned as soon as possible.

Such information can be issued publicly only after sufficient time has elapsed to be sure of the validity of such information. They should, however, be included in internal reports.

3.4. Conclusion of Rehabilitation

The decision to stop the rehabilitation is critical. Chemical accidents can provide work for a large number of scientists and technicians for an indefinite period of time. The decision to stop rehabilitation in whole or in part requires:

- a clear reason justified by objective criteria;

- an explanation of such a decision recognizing that such a decision represents a "loss" for the working social group.

The gradual halting of the program is justified as the study protocols are terminated.

The final re-evaluation (V. 4.2) is a decisive stage for each program. It should be discussed and agreed at a general meeting of all the committee members, to minimize the psychological trauma to the public, resulting from conflicting opinions. The decision to stop implies a certain degree of unanimity on the part of the responsible body.

4 Continuous Monitoring

4.1 Surveillance after rehabilitation

The restoration of the site to its original or modified state in no way eliminates the need for continuous surveillance, details of which will vary according to the toxic substances, the environment, and the effects observed so far.

In all cases, the following should be defined 'a priori':

- the expected duration of such surveillance
- the choice of the reference criteria chosen for checking the continuance of the results achieved.

To the objectives the following should be added:

- pointing out any possible problems linked with residuals which may be acceptable to the majority but possibly dangerous to certain sub-sets of the general population.

Under these circumstances it will be necessary to continue.

- the surveillance for possible resurgences
- the detection of accumulation places, ignored by the major clean-up operations.

At this stage, the participation of the public may seem desirable:

- reporting places, facts, or material to be examined.
- initiatives motivated by the learning or interpretation of the unexpected, or issues of minor importance, or the astonishing.
- Additional maintenance protocols can prove useful.
- Maintaining centres for recording all untoward effects may be desirable. Decisions to stop rehabilitation activities will be easier if there exists some clinical toxicology centres where vigilance is practised routinely.
- The ecological rehabilitation actions (artificial repopulation of dead or departed flora and fauna) may be the object of a maintenance programme.

4.2 Final Re-evaluation

The final duty of the rehabilitation authority consists of providing an overall synthesis of the experience.

This synthesis must include

- a description of the objectives as a whole, of the plan, of the protocols, their progress, their results, but, most importantly,

- the final re-evaluation of each parameter, criterion or indicator considered useful to future actions

- the interrelationship of these factors, and their correlations with others (for example, intercorrelations of biological dosages, but correlations of biological indices with ecological indices, etc.).

- The indication of ineffective solutions.

- A critical, post facto, re-evaluation of the decision stages.

Summing up, the final comparison should rovide "decision tables" starting from parameters, estimated "a posteriori".

4.3 Identification of Forecasting Indicators

This step is very important since the identification of indicators is one of the most valuable tools in the prevention of future accidents.

4.4 Identification of the Minimal Means of Action

- The best technical solution found under the past circumstances
- The names of the most desirable active members in the various action teams
- The most suitable tools in diagnostics and for detoxification.

SECTION IX

INFORMATION AND EXPERIENCE TRANSFER

1 Purposes

- 1.1 Information for records
- 1.2 Experience availa
- 1.3 Information for legislation and standard setting
- 1.4 Information for formal enquiry
- 1.5 Information for public participation
- 1.6 Information for training
- 1.7 Education at higher levels for engineers and managers

2 Means

- 2.1 Permanent storage and retrieval systems
- 2.2 Publications
- 2.3 Special reports
- 2.4 Mass media information
- 2.5 Manuals and training aids
- 2.6 Provision of expertise