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ASCOT Guidelines

Revised 1996 Edition

Guidelines for organizational self-assessment of safety culture and for reviews by the Assessment of Safety Culture in Organizations Team

INTERNATIONAL ATOMIC ENERGY AGENCY IAEA

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FOREWORD

In 1991 a Safety Series report on Safety Culture of the International Nuclear Safety Advisory Group (INSAG) was published as 75-INSAG-4. This document represents probably the most complete description so far of the safety culture concept along with its definition, features and tangible manifestations.

Very soon after the publication of 75-INSAG-4, interest was expressed as to whether it was possible to make an assessment of safety culture in a particular organization. Difficulties of performing such review should not be underestimated, since so much of the required characteristics lie below the surface. Certainly any comprehensive checks on equipment, documentation and procedures would not necessarily reveal the strength of safety culture.

In order to properly assess safety culture, it is necessary to consider the contribution of all organizations which have an impact on it. Therefore, while assessing the safety culture in an operating organization it is necessary to address at least its interfaces with the local regulatory agency, utility corporate headquarters and supporting organizations.

These guidelines are primarily intended for use by any organization wishing to conduct a self-assessment of safety culture. They should also serve as a basis for conducting an international peer review of the organization's self-assessment carried out by an ASCOT (Assessment of Safety Culture in Organizations Team) mission.

EDITORIAL NOTE

In preparing this publication for press, staff of the IAEA have made up the pages from the original manuscript(s). The views expressed do not necessarily reflect those of the governments of the nominating Member States or of the nominating organizations.

Throughout the text names of Member States are retained as they were when the text was compiled.

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1. INTRODUCTION

1.1. BACKGROUND

The International Nuclear Safety Advisory Group (INSAG), in its publication Safety Series No. 75-INSAG-4, defines safety culture as follows:

> **"Safety Culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance".**

Safety culture was considered by INSAG to have two major components in its manifestation: the framework created within which individuals work, and the attitude and response of individuals.

INSAG took the view that although such matters as style and attitude are generally intangible, they do lead to tangible manifestations which might be used to test what is underlying.

INSAG also took the view that sound procedures and good practices are not fully adequate if merely practised mechanically. This led to the proposition: safety culture requires all duties important to safety to be carried out correctly, with alertness, due thought and full knowledge, sound judgement and a proper sense of accountability.

In order to properly assess safety culture, it is necessary to consider the contributions of all organizations that influence it. Therefore, in assessing safety culture in different types of organizations, governmental, operating and supporting, it is necessary to consider at least the local regulatory agency, the utility's corporate headquarters and the nuclear facility itself.

An ASCOT review is normally based on tours of facilities and discussions with the hosts' personnel, at least at the regulatory agency, utility headquarters and at the plant. Most of the time, however, should be spent at the plant.

The ASCOT Guidelines are based strictly on the Appendix of Safety Series No. 75-INSAG-4. All the questions proposed in this appendix are addressed and they appear in the guidelines as Basic INSAG Questions. As mentioned in the reference INSAG document they can be expanded and it has been done in this document through the Guide Questions. Key Indicators that follow are intended to illustrate what is considered a sound safety culture.

In short it can be stated that the ASCOT Guidelines are intended to test the safety culture in an organization against the principles laid down in 75-INSAG-4 and in particular against indicators laid down in its appendix.

In a few instances, the Basic INSAG Questions have been slightly modified, when they were seen as promotion of the IAEA services. In all those cases changes have been clearly marked by insertion into parentheses.

1.2. GENERAL OBJECTIVES

The ASCOT services are intended to promote and support safety culture self-assessment studies performed by an organization based on principles and recommendations of Safety

Series No. 75-INSAG-4. The ASCOT services team members will share experience and good practices, and where possible offer suggestions contributing either to the preparation and conducting of a safety culture assessment and/or suggestions relating to the findings of a self-assessment. ASCOT services are not an inspection or an audit against set codes and standards but rather offer an opportunity to exchange experience and views. It is at the same time an opportunity to disseminate good practices throughout the nuclear community and to promote safety culture concepts.

2. ASCOT ADVISORY AND SUPPORT SERVICES

2.1. ADVISORY SERVICES

The objectives of the ASCOT services offered by the IAEA are aimed at providing Member States with a range of options to suit their individual requirements. It is the prime objective of the IAEA to support those States seeking to conduct their own assessment of safety culture and to make available expertise, assistance and training on request from the host organizations. It is acknowledged that the needs and resources for conducting ASCOT self-assessments and gaining access to the world's best practices will differ from country to country. To meet these varying needs and to provide a flexible support service the IAEA has developed the ASCOT advisory services to incorporate additional means of meeting Member States' requirements.

ASCOT advisory and support services now consist of the following options:

1. ASCOT STANDARD SEMINAR — covering a framework for safety culture, assessment methodology and the ASCOT concepts (Appendix I sets out the standard seminar details).
2. ASCOT EXPANDED SEMINAR — covering a wider range of operational safety topics focusing on the best world practices (Appendix II sets out the expanded seminar details).
3. ASCOT REVIEW — an ASCOT review combined with other IAEA reviews such as ASSET (Assessment of Safety Significant Events Team) or SRM (Safety Review Mission). (Appendix III sets out further details of this review).
4. PRE-SELF-ASSESSMENT SUPPORT — to provide expert support and advice prior to ASCOT self-assessment.

   POST-SELF-ASSESSMENT SUPPORT — to provide expert support and advice following an ASCOT self-assessment.

Therefore, where the Member State wants to conduct a self-assessment of the effectiveness of safety culture, it is recommended that it requests the ASCOT advisory or support service. The main objective of these services being to introduce and transfer to the individual country the ASCOT methodology and share experience gained during ASCOT reviews and to provide other information related to safety culture or the conduct of a self-assessment.

This support can also be provided if requested following an ASCOT self-assessment to assist Member States in the formulation of results, preparation of reports and the identification of solutions to issues raised during the assessment.

In preparing for the ASCOT review or support service, the host country participants would be provided with and should have familiarized themselves with both Safety Series Report No. 75-INSAG-4 and the ASCOT Guidelines prior to the visit. Likewise, the ASCOT representative would need to be familiar with any special aspects of the host country's regulatory system, the utility and the utility's supporting organizations that might warrant special consideration during the ensuing presentations and discussions.

These ASCOT services provide member states with a choice of options designed to guide members in pre and post phases of self-assessment with a minimum of external interference.

2.2. ADVISORY SERVICE OPTIONS

2.2.1. Option 1: Standard ASCOT seminar

In the case where the host country would like to become familiar with the ASCOT approach and its basic principles in order to conduct a self-evaluation of its organizations, the transfer of methodology can be accomplished through the standard ASCOT seminar. It is envisaged that this service would involve two ASCOT experts for two days, who would present the ASCOT approach in a workshop through a series of lectures, discussions and exercises.

Seminar objectives

Today it is widely recognized that sound safety culture is one of the most important contributors to the safe operation of NPPs. In order to promote the safety culture concepts and its importance, the IAEA has developed the *ASCOT standard seminar*. Participants from the regulatory body, operating organization and supporting institutions would be expected to attend the seminar. The purpose of the seminar is:

- to present internationally recognized indicators of an effective safety culture,
- to demonstrate the basic approach and principles of ASCOT, i.e. methodology for the assessment of safety culture,
- to give examples of good and bad practices from different NPPs in the world in order to illustrate on practical examples obtained from incident analysis and previous ASCOT reviews/seminars, the impact of safety culture on nuclear safety,
- to receive through the discussion among the participants the response on national practice for further dissemination.

The seminar lasts 2–2 ½ days and takes the form of a workshop, at which the objectives are reached through a series of lectures, discussions and exercises.

The lectures, discussions and exercises would include the following topics:

- Concept of safety culture,
- Examples of safety culture good practices,
- Creation of safety culture framework,
- Assessment of safety culture,
- Questions and key indicators.

Further details of these topics and their presentation are provided in Appendix I.

2.2.2. Option 2: Expanded ASCOT seminar

A further option which is to be offered in the future to member countries will be the expanded ASCOT seminar which will cover four main topics encompassing operational safety issues and activities. This type of seminar will be given by IAEA and/or outside experts for a duration of four working days and will provide in-depth coverage coupled with discussions of the latest world best practices. This type of service will provide opportunities for an exchange of good practices and will offer to the host country reference material for further development and introduction of new solutions to enhance nuclear safety and safety culture.

In the past three decades, means and methods for assuring nuclear safety evolved considerably and, in parallel with this evolution, the emphasis in the IAEA's nuclear safety activities has also shifted to meet new demands.Today most organizations are prepared to share their experiences and also learn from others through a free forum. The proposed structure of the Expanded ASCOT Seminar on Advances in Operational Safety is intended to achieve this.

Safety can change with time and it may be enhanced if adequate attention and resources are devoted to it or it can deteriorate if not properly addressed. It is the responsibility of management to monitor worldwide good practices and new trends in operational safety advances and apply them locally.

The introduction of the International Nuclear Event Scale (INES) has been a major step in communicating to the public the significance of any abnormal event occurring at a plant. The public and the media have accepted this tool and appear to be comfortable with this method of gauging the severity of reported occurrences in nuclear installations. The next task facing the nuclear community is to reassure the public by demonstrating that the level of safety is closely monitored and maintained at the highest level. It is clear therefore that there is a need for such safety to be transparent, however the solution of what would be the best means for communicating this message to the public has still to be developed. A starting point could be regular bulletins describing advances in operational safety, how the safety level is monitored and what has been done in terms of safety improvements.

This service would promote safety culture as useful but intangible concept, and at the same time would bring good practices and new approaches in the tangible sphere of operational safety, these being the manifestation of safety culture of any organization. The expanded ASCOT seminars are intended to fulfill this task, through the exchange of experience and research, without performing any kind of assessment or review in an organization. It is the responsibility of the operating organization to implement any good practices or new approaches.

Seminar objectives

The main objectives of the expanded ASCOT seminars are as follows:

(a) promotion of safety culture concepts and its tangible manifestations in the sphere of operational safety advances by dissemination of good practices and new trends;
(b) promotion and assistance to plant management in preparation, conduct and review of self-assessment of operational safety at their plant;
(c) assistance to plant management in preparation before receiving an external peer review;

(d) assistance in initiating public periodical bulletins on the status of nuclear safety in a country's facilities.

Duration and seminar structure

The expanded ASCOT seminar takes 4 working days and involves 3 IAEA and or outside experts who will deal, each day, with one of the following seminar topics:

(1) Staff, Management and Organization (Management and Organization, Safety Culture, Staff Selection and Training, Broader Training).
(2) Targets, Surveillance and Operations Support (Operation and Safety Performance, Procedures, Indicators, Safety Evaluation, PSA, Accident Management, Operator Support Systems).
(3) Safety Related Maintenance (Reliability Centred Maintenance, Outage Planning Utilizing Shutdown PSA Results, Ageing and Life Extension).
(4) Learning from Experience (Exchange and Feedback of Operating Experience, Updating, Upgrading Equipment and Systems).

Each working day will consist of four sessions all addressing the same topics:

1. Experts overview lecture.
2. Host informative presentation on local practices.
3. In-depth coverage and structured discussion of preselected issues.
4. Discussion and further elaboration of issues identified by the participants.

The in-depth coverage of preselected issues and issues identified by the host will take the form of a structured discussion, addressing the background, bases, historical development and current worldwide best practices. During this process the international experience will be detailed and offered for comparison with the host organizations's practices. Good practices identified at the host organization will be used to enrich subsequent presentations.

Deliverables

All lectures and in-depth presentations given by the experts will be based on written seminar materials prepared beforehand by the IAEA and/or outside experts.

It is the intention to gradually develop this lecture material (handouts) to produce four IAEA publications, each covering one topic. These publications could then serve as reference sources for host members in the development of new solutions and/or collections of world best practices and trends in the enhancement of nuclear safety.

Further details of this expanded seminar are provided in Appendix II.

2.2.3. Option 3: ASCOT review

The ASCOT review can be *combined with other IAEA services* such as ASSET (Assessment of Safety Significant Events Teams) or SRMs (Safety Review Missions). In this case an ASCOT representative would join the team. This expert is then dedicated to drawing conclusions on safety culture aspects from his/her own review plus from the findings of other team members who would, while performing their usual parts of the review give additional attention to safety culture aspects.

Following the analysis of safety culture data gained from the ASSET review material and additional sources the ASCOT findings are provided to the ASSET team for inclusion in their event review. This facilitates an exchange of additional information which can be utilized to reinforce the root cause analysis and corrective action recommendations of the ASSET mission. In this way the non-tangible elements inherent in events can be extracted and incorporated into the tangible manifestations of the safety significant events covered by ASSET.

In this case, where the safety culture review is combined with another IAEA review, the duration is adjusted to the duration of that review (normally 2 or 3 weeks). The conduct of the safety culture review within other IAEA mission would in that case be led by the ASCOT representative, who would co-ordinate constant interactions with other team members. As information on safety culture could be obtained directly or indirectly from each area of the other review, reviewers will receive a briefing and training specific to the needs of safety culture assessment.

The specific areas of review in organizations which are not initially included in the scope of the review activities will be covered by the ASCOT representative. In this context, the ASCOT representative would in addition to the exchange of information with other reviewers independently concentrate on interviews with, for example, corporate personnel, and government or regulatory organizations.

On completion of the combined mission the ASCOT representative will prepare a report which can be presented to the hosts at the closing meeting of the mission. This report will cover the background of the ASCOT review, methodology utilised, analysis of results and safety culture findings. This report will be subject to the same protocols for confidentiality and distribution as other IAEA reports.

Further details of this combined review are provided in Appendix III.

2.2.4. Option 4: Self-assessment support

Pre-self-assessment support

The IAEA can provide the service of pre-self-assessment support in order to assist Member States to set up their self assessment programme. This has the advantage of member states gaining independent expert advice on the application of the ASCOT Guidelines and provides practical advice for the conduct of an assessment. This coupled with the utilisation of the experience and local knowledge of the host country's staff, helps to ensure a meaningful and useful assessment which can be used for initiating improvements to enhance nuclear safety.

The pre-assessment support-team of 1 to 2 experts will normally be available for one week duration. During that time the team will be available to all parties wishing to conduct a safety culture assessment, and to those parts of the organization who will be assessed. The practical advice given will relate to Section 4 of these guidelines and include the exchange of experiences and views of organizations who have already conducted self-assessments.

The support may take the form of:

- Introducing self-assessment practices and the motivations for safety culture assessment.
- Description of methodologies for conducting a self-assessment, including consideration of resources, scope and depth, sample selection, data collection methods, questionnaire development, intangible evidence identification, tangible evidence sources.
- Description of methods for analysing assessment data, and the formulation of findings and conclusions.
- Presentation of safety culture concepts to parts of the organization who will be assessed and/or are likely to be affected by action plans.

At the end of the ASCOT pre-self-assessment service, the team will prepare and present a summary draft report on the assistance given to the host representative, any guidelines developed and examples of good practices supplied to the host's assessment team.

The report will be treated as confidential until commented on by the host, finalized by the ASCOT team, and released by the host country.

Post-self-assessment support

The IAEA can also provide the service of post-self-assessment support in order to assist Member States to analyse the findings of their safety culture self-assessments and develop improvement strategies. This has the advantage of Member States gaining independent expert advice on the formulation of improvement strategies, and the benefit of practical advice on methods for implementing actions for improvement. This coupled with the utilization of the experience and local knowledge of the host country's staff would assure the success of any action plan developed.

The post-assessment support team of 1 to 2 experts will normally be available for one week duration. During that time the team will be available to discuss the data or findings of the self-assessment and/or proposed action plans already formulated. The aim of the discussions will be to share the international experience of safety culture assessments, exchange views on proposed improvement plans, and to give support to the self-assessment team in forming, presenting and implementing improvement plans.

This service can also (where appropriate) assist with evaluating the progress of action plans by sharing the Member States' experience in this area.

The ASCOT post-self-assessment support team will prepare and present a draft summary report to the host describing the assistance provided to the host's representatives, any guidelines given, and examples of good practices supplied to the host's assessment team.

The report will be treated as confidential until commented on by the host, finalized by the ASCOT team, and released by the host country.

3. CONCEPTS AND ASSESSMENT OF SAFETY CULTURE

3.1. CONCEPTS

Safety Series No. 75-INSAG-4 identifies a multilayered approach to safety culture. It is the assembly of characteristics and attitudes, from government right through to the individual on the plant, that makes possible a culture which gives safety issues the attention

warranted by their significance. Government and Regulator provide the necessary statutory safety framework. The organizations that designed and built the plant as well as those who provide technical support also have a large impact on the safety performance of the plant in operation. The operating utility will also formulate policy on safety matters. The plant must then work within these externally set boundaries. 75-INSAG-4 makes it clear that safety culture is mostly about the performance of individuals but within an environment which is heavily influenced from outside the plant itself. Therefore an effective assessment of safety culture must also consider the organizations external to the plant.

Safety culture is a necessary characteristic to achieve safety in nuclear installations and as such it has to be possible to assess its status in order to improve it and maintain it at optimum level. This assessment has to be consistent with the general trend in the operation of a specific plant, in such a way that the existence of operational safety problems could be traced back to safety culture problems. However, it is prudent to anticipate and try to identify indicators that will give a warning before the problem occurs. These indicators will not "measure" the safety culture of a specific organization but rather indicate the need for a "fault finding" process to improve some of the different contributors to safety culture. This process is very specific to each organization and should relate the different influences in a similar way as described previously.

To obtain a methodology to assess or improve the knowledge of safety culture at a specific plant, efforts have to be made to relate attributes and concepts to facts connected with the operation of the plant. This correlation when feasible, will provide a basis for judging the effectiveness of safety culture in specific cases. This will clearly benefit the understanding of safety culture principles, which are generally not tangible.

3.2. STRUCTURE AND APPLICATION OF ASCOT GUIDELINES

In order to determine the effectiveness of safety culture at a plant it is necessary also to cover those organizations which have a significant impact on the activities and decision making in the utility. These include, but may not be restricted to, the governmental agencies, corporate management and support organizations. No strict rules are set down for coverage of these organizations; however, it is probable that responses from the utility will require that corroboration or explanation be sought from them. It is likely that these bodies are located at a considerable distance from the plant and in this event a representative from each may be able to provide the required information during the plant review. Whichever way the contacts are made, it is essential that a clear idea is formed by the reviewers.

Bearing in mind that other review systems cover more tangible aspects of safety, the "in-house ASCOT review" should examine those factors such as attitudes, morale, motivation and commitment to safety which usually are not considered by direct examination. The objective is to gain insight and understanding of perceptions and experiences contributing to or detracting from optimum safety performance. To gather this type of information it is necessary to collect a representative sample of opinions, facts and perceptions from the plant staff and related entities. Care must be taken to select sufficient sources of information within the time-scale set for the in-house ASCOT review. This requires the full co-operation of all parties involved.

At the plant and, if necessary, following a site visit and documentation overview, team members should schedule their time and commence structured discussions with nominated staff and managers. The ASCOT Guidelines set out sample questions and suggested lines of

enquiry which are intended to lead reviewers along the path to determining attitudes and perceptions which influence safety culture.

Each section of questions in the guidelines is labelled with prefixes as per the following table denoting the levels and organizations to be covered by specific areas of questioning:

I - Individual (applies to power plant only below managerial level).
M - Management (applies to power plant only above individual level).
C - Corporate (utility headquarters).
R - Regulator/Government (licence regulator).
S - Supporting organizations (research/design).

These are recommended areas of enquiry and may be permutated to suit the individual ASCOT review.

ASCOT reviewers should collect responses from each level and gather corroborative or alternative information to construct an accurate impression of the situation. Questions are to be developed ad hoc by the team to ensure that facts and statements are valid. During this process appropriate notes should be taken. At regular intervals the team members should compare notes and then develop a strategy for covering outstanding areas of the assessment. The team should further hold regular meetings with the management throughout the review to apprise them of any salient points prior to the final draft report being prepared and presented.

Each section of the ASCOT specific guidelines contains a key indicators listing. These are for the guidance of reviewers or others in highlighting key areas of safety culture assessment. The list is not exhaustive and has essentially been restricted to key words or phrases indicative of effective safety culture. Successive reviews may add to these key indicators with the aim of developing a more comprehensive set of references which will assist in the strengthening of safety culture. Reviewers should avoid pursuing a narrow line of questioning and should encourage free discussion and voluntary statements from those being interviewed.

The assessment method regardless of whether it is a self-assessment or a combined IAEA review is based on the consideration that safety culture is an assembly of commendable attributes of any organization or the individual contribution to nuclear plant safety. The effectiveness can therefore best be assessed by addressing different groups of organizations, governmental, operating and supporting.

The review of safety culture should normally begin with discussions at the government/regulatory office. During these discussions, the government/regulatory commitment to safety and their safety policy are addressed. The discussions at the government/regulatory offices should in general terms follow the questions and items outlined in Section 4.1 of the ASCOT Guidelines.

After visiting the regulators, a visit to the corporate headquarters should be arranged, where the corporate commitment to safety, its statement of safety policy and its interaction with the plant are assessed. At the corporate level the discussion would be guided by the questions outlined in Section 4.2.1 of the ASCOT Guidelines.

Reviews at the plant either IAEA or self-assessment begin with an initial overview. Certain manifestations of safety culture are readily apparent on a walk-through of the plant

and an overview of the documentation. Plants which do not appear well kept are likely to have areas where safety culture can be significantly improved. On the other hand, a good overall impression from an initial walk-through may be a positive indication of effective safety culture.

With these factors in mind, a practical assessment of safety culture should include an initial walk-through and overview of documentation. The following list could be a starting point:

Plant tour

- Access control: efficiency, effectiveness,
- General state of plant: leaks, lighting, labelling, etc.,
- Housekeeping: rubbish, storage areas, cleanness,
- Use of protective equipment: wearing of hard hats, ear protection and film badges, use of warning notices, etc.,
- Alert and watchful attitude of control room staff,
- Availability of procedures and manuals: in control room and in plant.

Documentation overview

- Log-books and associated documentation,
- Records of operation and maintenance,
- Number of plant defects and documentation amendments outstanding,
- Existence of training programme for key safety related activities,
- Availability of safety policies (company or corporate),
- Consistency of safety policy with safety culture concept,
- Plant policy on procedures and adherence to procedures,
- Documents identifying key safety responsibilities,
- Organizational charts,
- Existence of corporate safety review committee including its agendas, its expertise and the involvement of plant management.

Following the initial overview, the main assessment of safety culture and principal conclusions would be established through discussions and interviews with personnel following the ASCOT guideline indicators and questions.

The questions posed are deliberately open to invite discussion and explanation. The actual question asked may need to be tailored to the job of the person being interviewed so that it can be related to that person's practical experience. In each case notes are provided to guide the reviewer so that supplementary questions can be asked if necessary. The key indicators to safety culture are listed so that responses can be judged as indicative of safety culture effectiveness. The guidelines avoid any type of scoring or numerical rating since the objective is highlighting areas for improvement rather than comparing one plant with another.

The assessment team should concentrate their discussion and evaluation on individual and collective attitudes and knowledge rather than the technical content of procedures and systems.

In conducting interviews, the assessment team should keep in mind that the plant safety culture should span conventional, radiological and reactor safety aspects. The respondents

might not always have these distinctions in mind; therefore the assessment team must use the appropriate terminology to ensure that the respondent's answers cover all aspects of plant safety.

Questionnaires as a method of accessing a larger number of personnel within an organization have been successfully used in some countries. They can be based on the ASCOT Guidelines as an alternative structure. They should be combined with plant visits and collection of tangible evidence.

3.3. ASSESSMENT

The biggest problem for anyone undertaking a review of safety culture is how to identify, within a short period, the tangible evidence of an essentially intangible concept. It can be done but needs careful scrutiny that goes beyond the mere checking of documentation and review of management systems. It requires collection of information which can then be related to the characteristics of safety culture listed in 75-INSAG-4. This relationship is not easy to identify and often is not unique. For example an attribute or concept usually affects several facts and it is difficult to establish the degree of influence that different concepts have on a measurable fact.

Take for example the question of audits. This activity spans many of the layers previously mentioned. Most plants have a technical audit programme. Usually, the requirement for audits comes from corporate or even regulatory level. Audits are very often concerned with checking safety related practices. At the purely documentary level, it is quite straightforward to look at the audit programme, reports from audits done and clearance of any corrective actions that have resulted. However, in terms of safety culture there are many other aspects which can be assessed:

(1) Do those being audited consider their auditors to be technically competent?
(2) Do managers show support for the audit to their staff?
Do they explain the need for audits?
Do they make their own time available for briefings with the auditors?
(3) Is the audit report communicated to the relevant staff, particularly those who actively participated?
(4) Are any corrective actions identified by the auditors keenly debated and, once accepted, enthusiastically taken?
(5) Do auditors praise good practice and is such praise passed on?

By finding the answers to these questions it should be possible to get an understanding of whether audits are mechanically carried out to fulfil policy or regulatory requirements; or used in addition as a tool to stimulate interest and promote active participation in safety matters. The latter would be a stronger indication of safety culture.

Another important safety culture indicator is the willingness to strive for improvements. No plant management should consider that there is no scope for improvement when it comes to safety; this would be complacency. The tendency to question current systems and seek improvement, along with management support and commitment for the process, is an indication of safety culture. The following is a list of possible areas which could be checked for improvement programmes (the list is not exhaustive):

(1) Training: Increasing the time allocated, number of people being trained. Improving the quality of training or improving systems of qualification that are aimed at checking that competence is the result of the training given.
(2) Technical improvements: These could be improving the quality of procedures or introducing new safety assessment methodologies.
(3) Trying to anticipate problems: It is widely accepted that for every serious safety incident there are a large number of 'near misses'. Programmes aimed at reporting and learning 'from near misses' are good safety practice.
(4) Plant and operational improvements: These can be very wide, ranging from actual plant modifications (which should be strictly regulated) to improvements in the working environment.
(5) Development of indicators: It is often said that what cannot be measured, cannot be managed. Many plants use a variety of indicators, some safety related. None of these are perfect, but they can be used to indicate the trend in safety performance.

The question of audits and improvement programmes discussed above are examples to show how ASCOT methodology can get real indications of safety culture that would not be identified by checking on the existence of and adherence to procedures. These concepts and methods should be borne in mind when posing the questions contained in the next section.

3.4. ASSESSMENT REPORT

At the end of an assessment the review team should prepare a concise report. A suggested content of an ASCOT assessment report is outlined in Appendix IV. The report whether from a self-assessment or an IAEA combined review, should highlight any areas in which safety culture is strong or could be strengthened. Where possible the report should give specific suggestions that would guide the plant management to strengths and initiate any necessary improvements. The report should avoid any suggestion of grading, rating or comparison with other plants since this is not seen as a constructive way of striving for improvement. On the other hand the report should point out good practices which could be adopted by others to achieve effective safety culture.

In case of an IAEA combined review, the ASCOT team would present and hand over to the host the draft report of the assessment findings. The report will be treated as confidential until commented on by the hosts, finalized by the ASCOT team and released by the host country.

4. ASCOT GUIDELINES: SAFETY CULTURE INDICATORS AND QUESTIONS

These guidelines are based on the Appendix of Safety Series No.75-INSAG-4. All the questions proposed in this appendix are addressed but as mentioned in the reference document they can be expanded. It could be difficult to use all these in the available time. Selection of particularly significant items should be done through ASCOT team discussion.

4.1. GOVERNMENT AND ITS ORGANIZATIONS

4.1.1. Government commitment to safety

Within the safety culture framework the influence of government and its legislation forms a critical basis from which regulatory policy, funding and public notification are

determined. The following questions and key indicators provide a framework wherein an understanding of the prevailing situation may be formed. Other areas of enquiry may present themselves during the discussion with governmental representatives and these should be pursued if they affect plant operation. Opportunity to corroborate or clarify information gained elsewhere must be taken; however, the primary objective of highlighting good practices and promoting plant safety must not be forgotten. It will be advantageous to request and study the relevant legislation prior to the ASCOT review.

Q1 (CMR)

Basic INSAG Questions: Is the body of legislation satisfactory? Are there any undue impediments to the necessary amendment of regulations? Do legislation and government policy statements emphasize safety as a prerequisite for the use of nuclear power? Are there any instances of undue interference in technical matters with safety relevance?

Guide Questions:

- What is the mechanism and how long does it take to make changes to your nuclear legislation?
- What is the scope of the government regarding the control and administration of nuclear power? Is the authority and responsibility of the regulatory agency clear and understood by all parties? Are communication lines between government, regulatory agency and utilities well defined?
- What are the experience and qualifications of the regulatory agency management? What are the selection criteria? Are periodic audits considered?
- What role of the regulatory agency in the construction and operation of nuclear plants defined in the legislation?
- What is the regulatory agency's responsibility for assessing design safety standards and proposed designs as part of licensing procedure?
- What is the process for granting a licence to build and operate an NPP in your country?
- How is the assessment of the safety level of nuclear plants carried out?
- What design and operational safety documentation is required by the regulatory agency for its assessment as part of the licensing process?
- How are the regulatory agency technical and administrative requirements documented relative to the design, construction, commissioning and operation of nuclear plants?
- How are the regulatory agency's enforcement rights defined in the legislation? In the case of a dispute between the regulator and the utility what is the method of resolving matters? Has this happened?
- What is the government's policy on safety versus electricity production? What is the division of responsibility for these activities in the country?

Key Indicators:

- Clear, concise statements with adequate emphasis on safety as a prerequisite.
- Feedback from staff and regulators on non-interference with safety matters.
- There is an independent supervising regulatory agency with enough

manpower and with necessary enforcement rights, defined in the legislation.
- The regulatory agency has safety standards and/or instructions which show its supervisory practices in sufficient detail.
- The regulatory agency periodically assesses the safety of nuclear plants against well defined safety standards.

Q2 (CMR)

Basic INSAG Questions: Have budgets for regulatory agencies kept pace with inflation, with the growth of the industry and with other increased demands? Is funding sufficient to allow the hiring of staff of adequate competence? Does the government provide adequate funding for necessary safety research? Are the research results made available to other countries?

Guide Questions:
- Do you have a full staff complement?
- What has been the pattern of budgets to actual allocations over the past five years?
- How is your regulatory body funded?
- What happens to the funding allocation when unexpected events demand more money from the government?
- Do you gather any funds from providing research results to other countries?
- How does a change of government affect the regulatory body and the nuclear legislation?

Key Indicators:
- Adequate staffing levels and low turnover of qualified staff. Documented research results and plans for concerted research into areas of safety concern.
- Positive trends of funding for research organizations.
- Research and technical exchange visits with other countries or agencies.

Q3 (R)

Basic INSAG Questions: How free is the exchange of safety information with other countries? Does the country support relevant international activities [such as] the IAEA Incident Reporting System (IRS), the Operational Safety Review Teams (OSART) and Assessment of Safety Significant Events Teams (ASSET) programmes?

Guide Questions:
- With whom do you exchange safety information around the world?
- How does the country support affiliation to international organizations such as IAEA, INPO, WANO, owners' groups, etc.?
- Do you have access to nuclear industry information on a regular basis?
- Which sources do you access?
- What restrictions are there on dissemination of nuclear power plant data?

Key Indicators:
- Participation in international programmes and established systems for data collection and analysis.

- Frequent visits to other countries.
- Existence of exchange programmes.
- Literary search facilities for staff.
- Publications from research staff.

4.1.2. Regulatory agencies

Regulatory requirements vary significantly from country to country and it is difficult to generalize; however, the following questions and key indicators are designed to elicit responses which will assist the team in determining the effect of the regulator on the plants' safety performance. Care must be taken not to evaluate or compare the regulatory style with that in other countries. The safety culture should be well developed in the regulatory organization and its staff and should be set out in its own policy statements. A strong commitment to implement legislation and to act to promote plant safety and the protection of individuals, the public and the environment are the essential attributes of a positive regulatory safety culture. The influence of the regulator at corporate and plant levels of the utility is to be determined within the constraints of questioning, discussion and overview of documentation overview and not simply on intuitive feelings. Where the regulatory body is being assessed separately from the plant, emphasis should be placed on the national and social constraints governing the regulatory authority. Elements of the plant questions may also be adapted to the regulatory body as a stand alone review, the objective still being the same, to assess the safety culture.

Q1 (RCM)

Basic INSAG Questions: Are regulatory safety objectives annunciated clearly, meaningfully and so that they are neither too general nor too prescriptive? Do they permit a proper balance between innovation and reliance on proven techniques?

Guide Questions:
- What problems have been experienced with the application of the regulatory requirements?
- How are the authority and responsibility of the regulatory body understood by the plant?
- How is the scope of activities defined?
- Do you feel they are too restrictive? Too loose?
- What changes would you like to see to the regulatory conditions?

Key Indicators:
- Clear understanding and acceptance by the plant staff of regulatory requirements.
- Positive feedback from corporate and plant staff on application of regulatory conditions.

Q2 (RCM)

Basic INSAG Questions: Are comments on regulatory requirements sought from competent bodies? Have such comments been taken into account frequently enough to encourage future comments?

Guide Questions:
- What system is there for gathering comments on regulatory issues?
- How often have you commented on regulatory requirements? To what effect?
- What is the basis of the regulatory policy?
- How is it validated?

Key Indicators:
- Documented and established review system for comments and inputs from other bodies.

Q3 (R)

Basic INSAG Question: Is there a predictable and logical process for dealing with issues that require a consideration of both safety and economic factors?

Guide Questions:
- What is the process for handling issues of safety and commercial considerations? Is it well understood? Where is it documented?
- Is the regulatory body able to halt production unilaterally if safety is threatened? Has this ever happened?

Key Indicators:
- Regular third party review of regulatory requirements.
- Published comments on regulatory legislation.

Q4 (RCM)

Basic INSAG Question: What is the record of project delays or loss of production due to lack of clarity of regulatory requirements or lack of timely regulatory decisions?

Guide Questions:
- How many delays have been incurred at the plant due to regulatory constraints?
- What avenues of appeal does the utility have in the event of delays by the regulator?

Key Indicators:
- Positive feedback from utility staff on regulatory incurred delays.
- Effective regulatory policy on minimizing delays and reviewing submissions.
- Regular meetings of utility and regulator to address safety issues.
- Site representation of regulator and established call-out system.

Q5 (R)

Basic INSAG Question: Are regulatory practices generally consistent with the objectives of the IAEA's Nuclear Safety Standards (NUSS) Programme?

Guide Questions:
- On which model did you base your regulatory system?
- What differences, if any, are there between your regulatory practices and those of the IAEA (NUSS)?

Key Indicators:
- Good correlation between IAEA (NUSS) and regulatory requirements.

Q6 (R)

Basic INSAG Question: Is there an education and training programme for regulatory staff?

Guide Question:
- What is the recruitment programme content regarding qualifications and experience for new regulatory body staff?
- What is the content and length of the training programme? Does it address nuclear safety principles, plant knowledge, inspection skills, on the job training?

- How do you keep your regulatory staff up to date with nuclear safety and technology and plant experiences?

Key Indicators:
- Established education and training programme.
- Audited and regularly revised training standards for staff.
- Availability and use of international documents, periodicals, etc.
- Attendance at recognized courses, e.g. at the IAEA.

Q7 (R)

Basic INSAG Question: Does the regulatory agency participate actively in relevant international activities?

Guide Questions:
- What is your programme for participation in international conferences on nuclear matters?
- How are foreign visits planned, motivated and approved? Who is allowed to go abroad?
- How is the regulatory body funded?

Key Indicators:
- High profile in international activities.
- Publication of papers and presentations at recognized meetings. Participation in international safety reviews.

Q8 (RCM)

Basic INSAG Questions: Are reports on important safety problems published routinely by the regulatory agency? Does the regulatory agency periodically publish a summary review of the safety performance of plants?

Guide Questions:
- How do you ensure that important safety issues are made available to other plants, countries and the public?
- What is the regulatory policy on the publishing of plant safety performance data?
- What are the arrangements for timely notification and dissemination of information in case of incidents and accidents?

Key Indicators:
- Regular safety reports published.
- Programmes established for gathering plant safety data and trending of results for dissemination.

Q9 (RCMI)

Basic INSAG Questions: What is the nature of the relationship with licensees? Is there an appropriate balance between formality and a direct professional relationship?

Guide Questions:
- What would you consider to be the status of the regulator in the eyes of the utility?
- What level of co-operation exists between the regulator and the plant?
- How could the regulatory body improve its image at the plant?

Key Indicators:
- Positive feedback from plant staff on regulatory interfaces.
- Regular interactive meetings established with utility staff.
- Professional and informative reports available.
- Acceptance of comment from the utility.

Q10 (RCMI)

Basic INSAG Questions: Is there mutual respect between the regulatory staff and the operating organization based on a common level of competence? What proportion of regulatory technical experts have practical operating or design experience?

Guide Questions:
- Are you able to discuss matters at the plant on a common technical basis?
- How is the opportunity to work for the regulatory body viewed by plant staff?

Key Indicators:
- Positive feedback from plant staff on regulatory competence.
- High proportion of plant experienced staff and design personnel.
- Established and effective reviews by regulatory staff.

Q11 (RCM)

Basic INSAG Question: Is there regular joint discussion of the licensees' experience and problems and the impact of regulatory activities on these?

Guide Questions:
- How often do the regulator and utility meet to discuss requests for changes in regulatory requirements?
- At which stage do the regulator and utility meet to discuss requests for changes in regulatory requirements? To what extent are Emergency Planning and Accident Management issues adequately considered as part of the Nuclear Safety Programme?

Key Indicators:
- Regular meetings on problems with the utility.
- Established group on licensing and regulatory activities.
- Recognized routes for plant/regulator interactions.
- Existence of an independent methodology for resolution of concerns and safety issues.

Q12 (RCM)

Basic INSAG Question: To what extent does the regulatory agency rely on the internal safety processes of the operating organization?

Guide Questions:
- What is the philosophy of the regulatory body regarding the ability of the utility to control its own safety?
- How much of the plant's information is readily available to the regulator?
- How much control does the regulator impose on the utility?
- What are the scope and detail of inspection activities the regulatory agency applies to nuclear plants?

Key Indicators:
- Regulatory requirements include adequate safety processes, independent of the plant or operating organization.
- Establishment of regulatory controls to assure the adequacy of the plants' internal safety processes.
- Regular on-site checks and evaluations of plant safety processes.

Q13 (RMI)

Basic INSAG Question: What are the nature and extent of the regulators presence at the plant?

Guide Questions:
- How much does the plant see of the regulatory staff?
- What is the organizational relationship between regulatory and plant staff?
- Is the regulatory presence on site viewed as a help or hinderance?

Key Indicators:
- Regular and effective regulatory presence on site.
- Participation in development of surveillance regimes for key safety areas.
- Notification systems for activities and events out of hours.
- Positive feedback from plant staff on availability and effective inspection programme for site inspectors.
- Regular participation in plant safety meetings and committees. Assessment of reports from nuclear plants to implement preventive and corrective actions.

4.2. OPERATING ORGANIZATION

4.2.1. Corporate level

4.2.1.1. Safety policy at the corporate level

Corporate level safety policy statements vary in both form and content. A safety policy statement must, however, be clear and must be provided to all staff. It should declare a commitment to excellent performance in all activities important for the safety of its nuclear plants, making it plain that nuclear plant safety has the utmost priority, overriding if necessary the demands of production or project schedules. Essential areas of enquiry are indicated by the questions and key indicators which stress the importance of unequivocal support for safety over all other considerations and the understanding of policy statements by all levels of staff. Questions should be posed to discover the importance attached to the corporate safety policy, how it is documented, disseminated, authorized, reviewed and implemented. Key indicators are an unambiguous statement of safety above all else endorsed by the highest corporate level and translated into 'ownership' by the corporate management. It is very important to discern whether the corporate safety policy is understood and supported at all levels of the national nuclear industry.

Q1(CMI)

Basic INSAG Questions: Has a safety policy statement been issued? Is it clear? Does the policy express the overriding demand for nuclear safety? Is it brought to staff attention from time to time? Is it consistent with the concept of safety culture presented in the 75-INSAG-4 report?

Guide Question:
- Please explain what you know of any company or corporate safety policy statements.

Key Indicators:
- An organization operating a nuclear plant should issue a safety policy statement to all staff declaring its commitment to safety.
- Staff should be reminded about the statement from time to time.
- Safety policy statements will vary considerably in form and content.
- Staff should be aware of the following in an organization which has a well established safety culture:
  - the responsibility of the operating organization for the safety of the plant;
  - the commitment to excellent safety performance;
  - that safety is of the utmost priority, overriding if necessary commercial considerations.

Q2 (CMI)

Basic INSAG Question: Are managers and workers familiar with the safety policy and can staff cite examples that illustrate its meaning?

Guide Questions:
- Have you ever quoted from the safety policy to highlight safety in a meeting or discussion?
- What can you *not* do in terms of the safety policy statement?
- Who signs and takes responsibility for the policy statement on nuclear safety at corporate level?
- Do you have a copy of the safety policy?
- Have you ever discussed this document with your staff/peers?
- What do you consider the advantages and disadvantages of the safety policy?
- Does it need changing?

Key Indicators:
- Visibility and good knowledge of the current safety policy document.
- Examples of usage, demonstration of familiarity and agreement.

4.2.1.2. Safety practices at the corporate level

Policy statements and commitment to safety must be supplemented and effected by corporate management involvement in safety matters. Confidence in the competency and expertise at corporate level on nuclear safety matters enhances the plant's safety culture by reinforcement of utility safety policy from the top down. Establishment of an effective and credible nuclear safety review group at corporate level and the support of a designated senior manager with prime responsibility for safety may seem obvious prerequisites for utilities. However, quite often the utility delegates the nuclear safety portfolio to a minor level of the corporate structure. Significantly, this may be the most difficult area of enquiry to pursue and this may indirectly indicate an adverse influence on plant safety culture. Any evidence of a gap between the corporate and plant staff's interpretations of safety responsibility must be explored. Safety culture thrives on mutual support, agreement and a common understanding of safety objectives.

Q1 (CMI)

Basic INSAG Questions:	Does the corporate board have expertise in nuclear plant safety? Do formal meetings at this level include agenda items on safety? Do operating staff attend to discuss the safety performance of plants?
Guide Questions:	- Who is responsible for nuclear plant safety at corporate level? - Do you consider that there is adequate knowledge of plant safety at the corporate level? - Are nuclear safety matters given enough prominence at corporate level meetings? - Who attends corporate level nuclear safety review committee meetings? - To which levels are corporate nuclear safety minutes distributed?
Key Indicators:	- There is a clear line of reporting from the established nuclear safety review committee to the corporate board or representative of the board at the safety committee. - The corporate board has expertise in nuclear plant safety. - Inclusion of safety items on agendas: regular inclusion of plant staff in meetings. - Positive feedback from plant staff on corporate responses to plant safety issues.

Q2 (CM)

Basic INSAG Question:	Is there an active nuclear safety review committee which reports its findings at corporate level?
Guide Question:	- What is the relationship between the plant and corporate management with respect to discussion of nuclear safety issues?
Key Indicators:	- Minutes and actions from corporate nuclear safety review committees. - Plant confidence in corporate review groups. - Corporate inputs to plant/regulatory safety issues.

Q3 (CM)

Basic INSAG Questions:	Is there a senior manager with nuclear safety as a prime responsibility? How is he supported and assisted in his duties? What is his standing compared with that of the heads of other functions? Do senior managers visit the plant regularly? Do they give attention to safety matters?
Guide Questions:	- How often do the plant staff meet with corporate managers? - Who has the highest responsibility for nuclear safety in the utility? Is it considered effective?
Key Indicators:	- Job description and organizational confirmation of senior nuclear manager responsible for nuclear safety. - Positive perceptions by plant staff of senior managers' roles and responsibilities.

- High level of visibility and interaction between plant and senior managers.
- Willingness to submit all safety matters for senior manager review.

Q4 (CM)

Basic INSAG Questions: Are the resource requirements for the safety function reviewed periodically at corporate level? With what results?

Guide Questions:
- Who reviews safety function resource requirements? How is it done?
- How often are the resource requirements for the safety function upgraded?
- What criteria are used to determine the safety function resources and funding?

Key Indicators:
- Evidence of regular reviews of resources at corporate level.
- Positive attention to upgrading and maintenance of corporate staff ability and availability.
- Recognized career paths for plant and corporate staff which include nuclear safety management.

4.2.2. Plant level

This will undoubtedly form the bulk of the ASCOT reviewers' work and consequently requires the allocation of areas and interviews to assure optimum coverage in the time allotted. Plant activities have been divided into eleven (11) sections of assessment. These cover the key areas encompassing those aspects important to safety culture. Questions are presented as starting points from which the level of attainment of the key indicators can be gauged. Several questions are repetitive or similar indicating their relative importance in determining certain factors of attitude, commitment, safety practices and communications. Questions should be further developed to suit the particular plant circumstances with a view to establishing a picture of safety culture at the plant. The objective of the ASCOT review is to assess an organization's safety culture through a vertical and horizontal review of attitudes, communications and consistency in the implementation of safety throughout the plant.

Team members must always look out for good practices and give examples of improvements of safety culture. The accent should always be on positive aspects of performance and the promotion of enhanced safety culture within the organization and nuclear industry. However, where negative aspects exist these need to be brought out for assessment.

4.2.2.1. Highlighting safety

Q1 (CMI)

Basic INSAG Questions: Does the plant manager hold periodic meetings with his senior staff that are devoted solely to safety? Are there opportunities for non-management staff to participate in meetings devoted to safety? Do these meetings cover safety significant items at that plant? At other plants in the company? At other plants in the country? At other plants in the world?

Guide Questions:
- What means are there to promote safety culture amongst non-technical staff?
- How familiar are non-technical staff with safety issues at the plant? In the world?
- Where are safety priorities listed?
- How are suggestions and promotion of safety handled at the plant?
- Who attends the plant managers' safety meetings?
- What is discussed at these meetings? Are agendas circulated to staff?

Key Indicators:
- Regular safety meetings.
- Documented actions and close out.
- Established protocols for meetings and actions.
- Wide scope of agenda items.
- Positive feedback from staff on the applicability and access to safety meetings.
- Circulation of safety meeting minutes and actions for review.

Q2 (CM)

Basic INSAG Question: Has consideration been given to requesting (an independent peer review such as for example) an OSART review or similar external review?

Guide Question:
- Would such safety review receive support throughout the organization?

Key Indicators:
- One or more of peer safety reviews requested or held and with positive follow-up.
- Evidence of self-appraisals.
- Technical safety reviews.
- Positive feedback from staff on proposals for external review.

Q3 (MI)

Basic INSAG Questions: Is there a process by which more junior staff can report safety related concerns directly to the plant manager? Is the process well known? Is there a system for reporting individuals' errors? How is it made known to staff? What mechanism is available to staff to report errors even when they were immediately corrected or had no detectable effect? Do staff make occasional use of the mechanism provided?

Guide Questions:
- How would a junior member of staff report a safety concern to the plant manager?
- What system would you use to report minor safety concerns?

Key Indicators:
- Documented system of direct reporting even to the plant manager.
- Positive feedback from staff on past reporting experiences.
- Management encouragement for safety reporting.
- Documented policy statement on safety reporting.
- Confidentiality provisions for reporting unsafe acts to plant, corporate or regulatory bodies.

Q4 (CMI)

Basic INSAG Questions: Do systems of reward include factors relating to safety performances? Are staff aware of the system of rewards and sanctions relating to safety?

Guide Questions:
- To your knowledge do the safety records or attitudes to safety of individuals have any effect on their promotion aspects? If so, do you know of any examples of this? Would you expect the salaries/wages of individuals to be linked to their safety performance? How do you feel about this?
  Note: The acceptance or rejection of safety considerations in the assessment of remuneration or personal advancement influences the attitudes of individuals to safety culture. A resentful attitude can lead to misreporting of errors and the suppression of facts. A balanced approach is accepted as an indicator of a well understood and fair minded policy on reward and penalty for safety performance.

Key Indicators:
- No sanctions which are demotivating.
- Individuals are encouraged to express safety concerns, to report safety related observations.
- A visible tendency for those who actively promote safety issues to be more likely to be promoted.

4.2.2.2. Definition of responsibilities

Q1 (RCMI)

Basic INSAG Questions: Has the assignment of safety responsibilities been clearly annunciated? Has the responsibility of the plant manager for nuclear safety been clearly stated and accepted?

Guide Question:
- Who is responsible for nuclear safety on the site?
  Note: The delegated responsibility of the plant manager for safety is a key element of safety culture. This concept needs to be understood and accepted by the managers. Managers must assign individuals to particular responsibilities and make sure that these assignments are understood by those involved.

Key Indicators:
- Responses should contain the following key points:
  - the operating organization is responsible for nuclear safety;
  - this is delegated by the operating organization to the plant manager;
  - there are clear, unambiguous and documented definitions of responsibility of individuals;
  - safety responsibility included in job descriptions and reinforced at training sessions;
  - an acceptance that everyone is at least responsible for safety in their own sphere of work.

Q2 (MI)

Basic INSAG Questions:	Are the documents that identify safety responsibilities kept up to date and reviewed periodically? With what result? (*To be partly covered in the review of documentation*)
Guide Questions:	- Who is responsible for reviewing safety responsibility documents? How do changes of responsibilities get transmitted to the staff?
Key Indicators:	- Clear responsibilities for keeping documentation up to date.

4.2.2.3. Selection of managers

Q1 (CMI)

Basic INSAG Questions:	Do the staff recognize that attitude to safety is important in the selection and promotion of managers? How is this recognition fostered?
Guide Questions:	- What are the major criteria used to select managers? - How could the selection of managers be improved?
Key Indicators:	- Documented and established criteria for the selection and promotion of managers. - Positive feedback from staff on the criteria application.

Q2 (CMI)

Basic INSAG Question:	Do annual performance appraisals include a specific section on attitude to safety?
Guide Questions:	- Why would you expect annual performance appraisals to cover safety attitudes? - How can safety attitude be assessed throughout the year?
Key Indicators:	- Established mechanism for regular review of safety attitude of individuals. - Performance appraisal sheets show specific reference to safety: documented criteria for managers to gauge safety performance. Positive feedback from appraised staff: evidence of safety related awards and sanctions system.

Q3 (CMI)

Basic INSAG Question:	Can cases be identified in which safety attitude was a significant factor in approving or rejecting a promotion to management level?
Guide Questions:	- What would be considered an acceptable attitude to safety? Can you quote an example? - Has anyone, to your knowledge, ever been rejected for promotion because of safety attitude problems? Is there an explicit example of this?

Key Indicators:
- Current examples of promotion assessments.
- Documented and understood criteria for promotion.
- Positive evidence of safety attitude as a selection criterion.

4.2.2.4. Relations between plant management and regulators

Q1(RCMI)

Basic INSAG Questions: Is the relationship frank, open and yet adequately formal? What is the nature of arrangements for access of regulators to documentation? To facilities? To operating staff? Are required reports to the regulatory agency made in a timely fashion? At what levels are the plant contacts for the regulatory inspectors? Does the plant manager meet routinely with regulatory staff?

Guide Question: What is the nature of the relationship between the plant management and the regulation agency?
Note: An open and constructive relationship with the regulator is in the interests of safety. Staff may require guidance on how they should respond to requests from regulatory inspectors for access and information. There should be a continuing dialogue between the two so that if a contentious issue arises there are adequate communication routes available for the problem to be resolved in an atmosphere of mutual trust and respect.

Key Indicators:
- Desire for frank and open discussion.
- Adequate formality.
- Regular meetings at plant manager level.
- Clear advice to staff to co-operate with regulatory inspectors.
- Provision for informal contact with regulatory inspectors at all levels of staff.
- Timely production of any reports required by regulators.

Guide Questions:
- What is the role of the regulator in the everyday running of the plant?
- Do you consider the regulator to be effective in monitoring activities?
- How often do you see the regulatory inspector? Do you discuss your work?

Note: The regulator is expected to strike a balance between formality and a direct professional relationship. Mutual respect between the regulatory staff and the operating organization should be based on a common level of competence. Regular joint discussions of the licensee's problems and experience and the impact of the regulatory requirements must take place. Individuals in the operating organization should be aware of the mechanisms by which the regulator assures himself or herself of the safety issues. Site inspectors should be technically credible to the operator with a high degree of personal integrity. Regulatory requirements should be clearly understood by all staff members at the site and the safety objectives accepted at all levels.

Key Indicators:
- Respect for the professionalism and technical competence of the regulator and their acceptance by management will indicate an enhancement of safety culture.

- A willingness to contact the regulator for advice and judgement on certain safety issues.

4.2.2.5. Review of safety performance

Q1(CM)

Basic INSAG Questions: Does senior management receive regular reviews of the safety performance of the plant? Do these include comparisons with the performance of other nuclear plants?

Guide Questions:
- Who prepares reports on safety performance for senior management?
- Are there any objectives set which would define internal safety goals?
- What are considered to be the main safety indicators?
- Where and when are the safety performances discussed with senior management?

Key Indicators:
- Records of safety information sent to senior management.
- Documented system for reporting safety data to senior management.
- Annual report information on safety issues.
- Documented actions by senior management on negative trends in safety.

Q2 (CM)

Basic INSAG Questions: Are the results of safety reviews acted on in a timely way? Is there feedback to managers on the implementation of lessons learned? Can managers identify changes that resulted from reviews?

Guide Questions:
- What is the average time it takes for safety items raised at review meetings to be resolved?
- What benefits have been derived directly from safety review lessons learned?

Key Indicators:
- Documented action plans for resolution of safety issues.
- Established mechanisms for feedback of completed actions.
- Tracking system in place for monitoring safety issues status.
- Authorized persons nominated specifically for addressing safety issues.
- Regular safety review meetings and close-out actions.
- Positive feedback from staff on resolution of safety issues.

Q3 (CM)

Basic INSAG Questions: Are managers aware of how the safety of their plant compares with that of others in the same company? In the country? In the world?

Guide Questions:
- What is the present comparative ranking of the plant in the national and international tables?
- Is there an action plan derived from this data?
- What is the current trend of the plant safety performance?

Key Indicators:
- Instituted system of utility ranking.
- Annual report data on plant performances.
- Regular bulletins on plant safety status.
- Evidence of improvements as a result of inter-plant information exchange.

Q4 (CMI)

Basic INSAG Question: Do staff routinely read and understand reports on operating experience?

Key Indicators:
- Good knowledge of operating experience across staff levels.
- Review of modifications by staff.
- Established system of experience feedback.
- Positive feedback from staff on adequacy of reports and operating information.

Q5 (RCMI)

Basic INSAG Questions: Is there a system of safety performance indicators with a programme for the improvement of performance? Are the safety performance indicators understood by staff?

Guide Question: What do you know of any systems at the plant for measuring safety?
Note: The question is about the use and comprehension of safety indicators as a means of judging the effectiveness of any improvement initiative.

Key Indicators:
- A plant with an effective safety culture should produce safety indicators and display them to staff with an explanation of their meaning.
  Such indicators might be:
  · number and severity of significant events;
  · unavailability of safety systems;
  · plant availability;
  · radiation exposure;
  · lost time accident rate;
  · number of unplanned trips;
  · pending work orders.
- Another key indicator of safety culture is the ability to quote some specific initiative at the plant aimed at improving safety, perhaps using an indicator as an example of success.

Q6 (CM)

Basic INSAG Question: Are managers aware of the trends of safety performance indicators and the reasons for the trends?

Guide Question: How does the management monitor and review the nuclear safety and performance of the plant?
Note: There should be a range of monitoring measures and practices which go beyond the traditional perception of Quality Assurance. For

anything to be effectively managed, it needs to be measured. Therefore the establishment of safety indicators is expected. There should also be a recognition that management needs to be seen by the staff to be giving a high priority to safety matters. This might mean the establishment of special reviews and meetings.

Key Indicators:
- Existence of regular safety management review meetings;
- Existence of safety indicators such as availability or unavailability of safety related systems;
- Number of outstanding plant defects, etc.;
- The monitoring of trends in safety indicators and the taking of actions to bring about improvements;
- The comparison of safety indicators with other similar plants.

Q7 (RMI)

Basic INSAG Questions: What arrangements exist for reporting safety related events at the plant? Is there a formal means for evaluating such events and learning the lessons? Is there a formal mechanism by which staff who were included in a significant event are consulted on the final contents of a report?

Guide Questions:
- How do you know what sort of events need formal reporting?
- How are events followed up?
- Do the operators see or comment on reports of events?

Key Indicators:
- Clear instructions on what sort of events need formal reporting and how and to whom;
- Events analysed for safety lessons;
- Use of human factor methods;
- Operations staff involved in the evaluation process;
- System for identifying adverse trends;
- Results of event analysed used in training programmes.

Q8 (MI)

Basic INSAG Questions: Is there a full time safety review group which reports directly to the plant manager? Does the organization have effective safety information links with operators of similar plants? Does the organization contribute effectively to an international safety reporting system?

Guide Questions:
- What is the composition of the permanent safety review group? Does it include outside experts?
- Does the review group meet regularly or on demand?
- What is the main task of the review group?

Key Indicators:
- Well documented minutes of safety review group.
- Established system of review with review group as a mandatory step.
- Procedures including review group approvals.
- Regular inter-plant meetings or data links.
- Positive acceptance of review group by plant and regulatory staff.

Q9 (RCMI)

Basic INSAG Question: What are the trends for the number of outstanding deficiencies, temporary modifications or operating manuals in need of revision?

Guide Questions:
- Please describe the tracking system for monitoring outstanding modifications and issues?
- What is the current situation on temporary modifications and outstanding issues?

Key Indicators:
- Positive trends of outstanding deficiencies: declining number of temporary modifications with short durations.
- Regular revision of manuals.
- Positive feedback from staff on numbers and status of procedures, modifications, etc.
- Positive response to QA reports.
- Established and effective system for tracking safety related documents.

4.2.2.6. Training

Q1(MI)

Basic INSAG Questions: Does all critical training and retraining culminate in formal assessment and approval for duties? What is the success/failure record? What is the proportion of operating staff's time devoted to training and how does this compare with the practice of other nuclear plant operators?

Guide Questions:
- What kinds of job related training have you received since coming to work at the plant?
- What specific training have you received in the areas of:
  - personnel/industrial safety practices;
  - radiological protection;
  - nuclear power plant safety;
  - job specific training for your craft/activity/function;
  - emergencies?
- What part of your training is required by the training programme and what part is voluntary?

  Note: The first question will establish whether personnel recognize that they have or have not received instruction in the key areas and will help to gauge the relative weights given to safety oriented training versus production.

Key Indicators: Staff should recognize the differences between:
- good industrial safety practices that would be expected in any industrial setting;
- special radiological health practices and controls;
- rudiments of nuclear power plant principles of operation and safety aspects;
- how their jobs relate to plant safety;
- what they are expected to do in an emergency.

Guide Questions:
- What sort of certification or licence do you receive for each kind of training described? Are these internal certifications (i.e., by plant/company, regulatory agency)?
- Are you required to, or do you have periodic retraining and recertification for any or all of your job related training?
  Note: The purpose of the questions is to determine the degree of formalism and control in training beyond regulatory requirements and establish whether the plant supports and requires retraining in all safety areas.

Key Indicators: One indicator of management commitment to supporting safety culture is the provision of continuing reinforcement of training beyond the mandatory requalification of control room operators, i.e. that other areas of staff training are formalized and that all key personnel understand the importance and extent of such training.

Q2 (CMI)

Basic INSAG Questions: What resources are allocated to training? How does this compare with the allocations of other nuclear plant operators?

Guide Questions:
- On what is the allocation of resources for training based?
- Has the resource level been reviewed against similar plants elsewhere?

Key Indicators:
- Commitment at the management and corporate level to provide adequate resources to allow effective training.

Q3 (CM)

Basic INSAG Question: Is the quality of training programmes assessed at corporate and plant management levels?

Guide Questions: At what level is the quality of training programmes reviewed?
How often is the training programme reviewed?
What is the training programme reviewed against?

Key Indicators: Existence of a satisfactory training policy, facilities, staff and budget.

Q4 (RMI)

Basic INSAG Questions: Is there a periodic review of the applicability, correctness and results of training courses? Does this review take into account operating experience feedback? Can training staff cite examples of operating errors that have resulted in modifications to a training programme?

Guide Questions:
- How is content of training for your staff established? What portion is dictated by regulatory requirements versus plant imposed safety policy? Is there any inclusion of feedback of operational problems at your plant?
- How often is content reviewed for currency? By you? By others (e.g. senior management)?
- Who are the trainers and how are they selected? Are trainers required

to be retrained periodically? Is there an exchange of staff between operations and training departments?

Note: The purpose of the questions is to clarify the manager's attitude to providing sufficient training to support safety policy via a highly skilled staff rather than just achieving the minimum required by regulators.

Key Indicators:

- Training content is established and periodically reviewed for relevance.
- Inclusion of plant experience.
- Maintaining relevance.
- Selection and qualification of trainers.
- Evidence that training is current and relevant, e.g. by rotation of trainers through operations or spending time on shift.
- Ongoing evaluation sessions between instructors and students.
- Positive feedback from staff on operating experience discussion and re-enactment.

Guide Questions:

- What is the schedule for your training to maintain your qualification status?
- What kind of preparations do you have to make before you report for a training session? For example, do you keep notes on issues that may have come up on shift so that you could discuss them with the trainer? Perhaps to arrange for practice or demonstration?

  Note: The purpose of these questions is to see if staff are active in training and if they seek out training.

Key Indicators:

- Attitude of doing more than what is required, i.e. not just attending because it is mandatory.
- Preparation - operational feedback - input.
- Influencing of content by staff.
- Training proposals included from staff performance appraisals.

Q5 (MI)

Basic INSAG Question: How frequently are production requirements permitted to interfere with scheduled training?

Guide Questions:

- How do you cope with an unforseen event requiring more staff at short notice?
- What arrangements are there for staff to catch up on missed training?
- What input does the training department have into the planning of production activities?
- How much of a problem is the rescheduling of your training because of production pressures?

Key Indicators:

- Completed training schedules and contingency planning. Management directives on maintenance of training in the event of production conflicts.
- Positive feedback from plant staff on management commitments to training despite production pressures.

- Plans for utilization of additional staff as instructors, e.g. shift technical advisors, other plant staff, consultants.
- Evidence of completed shifts and training sessions.
- Adequate repetition of training courses to all staff.

Q6 (MI)

Basic INSAG Questions: Do staff understand the significance of the operating limits of the plant in their areas of responsibility? Are the staff educated in the safety consequences of the malfunction of plant items?

Guide Questions:
- What particular cautions or safety limits must you observe in your job? (e.g. pressures, temperatures, tank levels that you must control or be aware of?) What would happen if the limits were violated? Is there anything of which you have to be careful so that you do not accidentally cause limits to be exceeded?
- Has the plant, to your knowledge, ever been operated outside the operating limits?

  Note: The purpose of these questions is to explore the depth of knowledge that the individual has regarding the relationship of job activities to personal and plant safety.

Key Indicators: Dialogue should elicit responses that cover:
- understanding of safety limits related to their job;
- personal mental model of plant and how their specific job relates to plant safety;
- potential consequences to self and plant if they make an error in their job, e.g. what would occur; how fast would a crisis develop;
- depth of understanding regarding the bases for operating limits and safety margins.

Q7 (MI)

Basic INSAG Questions: Are staff trained in the special importance of following procedures? Are they regularly reminded? Are they trained in the safety basis of the procedures?

Guide Questions:
- What kinds of written operating procedures do you use in your daily work?
- Do you feel that you need to have the written procedures open in front of you to perform the correct actions in the correct sequence? For normal operations?
- How easy to use do you think the procedures are?
- What was your training on emergency operating procedures: how do the trainers lead you through the bases? How much are you expected to know by memory?
- What is management's policy on following procedures verbatim? In all cases?
- Are you given authority to override procedures?

- Have you taken part in the procedure validation process? What was the result?
- Have you or colleagues suggested improvements or spotted errors in procedures?

Note: The basic premise is that well thought out and validated procedures for operations will minimize the likelihood of operator errors and operators should be trained to trust the procedures. However, the training should impress upon the operators the need to continue to ask questions, especially when situations vary from the expected evolutions. Operators need to feel a sense of ownership of the procedures. These questions should also be put to other key staff, i.e. in maintenance or radiation protection, with suitable amendments.

Key Indicators:

- Knowledge of bases for procedures with a realization that procedures may not cover all eventualities.
- Operator suggestions for procedure improvements are incorporated in a timely way.
- Operators are involved in the procedure validation process.
- Clear understanding of policy on procedure adherence.
- Operator confidence in procedure accuracy and format.

Q8 (RMI)

Basic INSAG Questions:

For control room operators, do retraining sessions on simulators take into account the difficulties that staff have experienced and the questions that they have raised? Are training simulator modifications made as soon as the plant is modified?

Guide Questions:

- Please describe how you make use of control room simulators to support the plant and corporate safety policy?
- Discuss the frequency and duration of simulator training for each operator? What steps do you take to ensure that operators receive simulator and other training when scheduled?
- What guidelines do you establish for the content of simulator training? For example, how much time is spent on maintaining skills in handling normal operational transients versus simulated accidents of various types and probabilities? How do you make sure that operating problems or operator concerns of your plant or similar plants are addressed in the simulator?
- Are you able to attend and observe operator simulator training?
- What do you do during simulator sessions to help improve team performance of operating crews, especially during accident scenarios?
- Are you able to keep the simulator model consistent with plant modifications?
- What counterparts to the simulator are provided for plant equipment operators; maintenance staff, etc.?

Note: The purpose of the questions is to determine the value and priority placed on simulator and training aids by managers. Failure to ensure timely and meaningful simulator training or continuing proof of commitment will affect operators' attitudes toward simulator training. The ideal would be to provide a plant specific simulator with very

frequent sessions but this may not be possible for all plants. Even if operators and managers level travel to a simulator site only infrequently, the management should provide as much simulator time as possible and emphasize its importance by attending and observing.

Key Indicators:
- Frequency of simulator use.
- Content; including feedback from operations and operator requests.
- Keeping simulator current with plant.
- Use of simulator sessions to improve team performance of operators.
- Use of other training aids for equipment operators and maintenance staff.
- Good scope of simulation and faults.
- Management involvement in training sessions.

Guide Questions:
- How often do you train on a simulator? Do you go as an individual or with the rest of the shift?
- What kind of events do you cover, e.g. design basis accidents? Events from other plants, beyond design basis accidents?
- If the simulator is not plant specific, are you able to use the current procedures for your plant?
- Do you and colleagues have a say regarding events to be included, e.g. based on operating experiences?

Note: The purpose of this area is to determine the resources and priorities given to simulator training and the degree to which operators value and contribute to training. The opportunity for team training should be explored.

Key Indicators:
- Plant specific simulator is available to operators (own or elsewhere).
- Frequency with which they attend.
- Management commitment to training.
- Balance between normal operations and emergency response.
- Feeling of participation and ownership by operators.
- Team/shift training.
- Evaluation of training results by operators.

Q9 (MI)

Basic INSAG Question: For maintenance personnel, do training sessions make use of mock-ups and video recordings before a complex maintenance activity is performed?

Guide Questions:
- What methods do maintenance staff use to prepare for complex work?
- How does the plant dose rate record compare with that of plants worldwide?
- How much of the budget is allocated to special tools, mock-ups and video equipment per year?
- Is there on the job training? How is it carried out?
- Do you get enough rehearsal time before a maintenance activity?

Key Indicators:
- Training mock-ups and equipment in evidence and use.
- Rehearsal time built into schedules of work.
- Procedural references to preparatory training.

- Feedback of event reports into work preparations.
- Low dose rates recorded for maintenance work.
- Ongoing video recording of maintenance work for future use.
- Mock-ups replicate the plant and replacement components used for training.
- Safety reinforced in documentation and training sessions.

Q10 (MI)

Basic INSAG Question: Do training programmes address safety culture?

Guide Questions:
- In addition to training staff to perform jobs correctly for production purposes, how is knowledge of each individual's contribution to plant safety communicated?
- Are your staff given specific training on potential consequences of an error they might commit, e.g. exceeding a safety limit of the plant or potentially harming themselves?
- Are there written procedures for your staff? Are they required to follow them verbatim by regulators, plant policy or your policy? Are the staff aware of the consequences of not following procedures, e.g. would this lead to a violation of a safety limit?

Note: These questions should address managers' attitudes towards safety related training for their staff.

Key Indicators:
- Relevance of operating limits reinforced.
- Consequences of error transmitted to all staff levels.
- Bases and use of written procedures stressed constantly in training and operations.
- Specific safety culture promotion sessions.
- Total acceptance of validity of procedures.
- Acknowledgement by managers of good safety performance.

4.2.2.7. Local practices

Q1 (CM)

Basic INSAG Question: Has the plant manager instituted any safety related initiatives that go beyond requirements set at the corporate level?

Guide Questions:
- What do you know of initiatives set out by the plant manager to improve safety?
- How effective is the Plant manager's safety improvement programme?
- What systems are in place to recognize the contribution of plant managers to safety? Is there a system of awards?

Key Indicators:
- Unique programmes on safety.
- Feedback from staff on new initiatives.

Q2 (RMI)

Basic INSAG Questions: Are records on the performance or maintenance of components and systems easily retrievable? Complete? Understandable? Accurate? Up to date? (*to be partially covered by documentation review*)

Guide Question: Are maintenance records used to trend major equipment reliability?

Key Indicator: Maintenance records used in a positive manner.

Q3

Basic INSAG Question: What is the general state of the plant in terms of general appearance and tidiness, steam and oil leaks, the tidiness of log-books and records? (*to be covered by a plant tour*)

Q4 (CMI)

Basic INSAG Question: What are the arrangements for supervising, reviewing and signing off maintenance work carried out by supporting organizations?

Guide Questions:
- What special safety related problems are posed by the use of contractors and how are these addressed?
- How many contractor related problems does the plant experience annually?

Note: Contractors (and other supporting organizations) are not routinely exposed to the safety culture which is fostered at the plant and therefore special efforts are required to make sure that the work done and working methods are satisfactory with respect to safety. The questioner should try to find out what is done over and above normal commercial quality assurance practice.

Key Indicators:
- Specific arrangements for safety briefing of contractor's staff before they start work.
- Specific arrangement for supervising, reviewing and accepting work done.
- Evaluation of the quality of contractors before the tendering process.
- Declining trend in contractor related problems.
- Regular meetings with external bodies to discuss safety issues.
- Penalty clauses related to safety built into contracts.
- Regulatory inspection programme of contract work.
- Availability of radiation protection records.

4.2.2.8. Field supervision by management

Q1 (RMI)

Basic INSAG Questions: What is the working style of the senior supervisors on shift? Do they seek information? Are they well informed? Do they visit routinely the areas where safety related work is being done? Are they interested in the problems or solely the schedules? What fraction of the time of the senior person on shift is spent on administrative duties?

Guide Questions:
- What training in leadership, time management and supervision does a senior shift supervisors (SSS) receive?
- How do SSSs keep their plant knowledge up to date?
- What more could be done to make the SSS more effective?
- How often do staff seek out the SSS for advice and guidance?
- What would happen if the SSS spent long hours out of the control room?
- How much knowledge does an SSS need to have?
- What differences are there between the various SSSs' ways of working?
- How much authority does an SSS have on shift?
- Can anyone overrule a senior licensed operator on shift?
- Does the operations supervisor follow up the activities of the SSS/operators and field operators?

Key Indicators:
- Shift logs and supporting documentation shows regular SSS involvement and visits.
- Documented policy and job descriptions state duties, responsibilities and safety accountability of SSS.
- Assistance provided for SSS on administrative duties.
- Selection criteria and training for SSS includes safety reinforcement and questioning attitude.

Q2 (MI)

Basic INSAG Questions: Do middle managers often make first hand inspections of the conduct of safety related work for which they are responsible?
Does the plant manager from time to time inspect the conduct of safety related work?
Do senior managers visit the plant regularly? Do they pay attention to safety matters?

Guide Questions:
- How often do you see managers about the plant?
- Do managers ever come round on tours of inspection?
- Is seeing a manager at the work-place an indication of trouble?

Key Indicators:
- Management visibility around the work-place.
- Regular tours of inspection by managers, particularly looking for problems related to safety.

4.2.2.9. Work-load

Q1 (RCMI)

Basic INSAG Questions: Is there a clear policy on limits to overtime worked? To which staff does it apply? How is overtime controlled, monitored and reported to the plant manager and higher management?

Guide Questions:
- How do you get assurance that staff are fit for duty at the start of a shift/day?
- Where are the limits for overtime stated?

Note: It is important that staff are not permitted to take up duties if they are unfit to do so through tiredness, illness, drugs, alcohol, etc. In addition to management controls, staff should be encouraged to develop and follow codes of practice covering the above.

Key Indicators:
- Stated policy on maximum working hours and minimum time off between shifts.
- Monitoring of hours worked.
- A system which requires a fitness for duty judgement at the start of a shift.
- Codes of practice understood and accepted.
- Contingency plans for unforeseen demands on staff.

4.2.2.10. Attitudes of managers

Q1 (CMI)

Basic INSAG Question: When there is apparent conflict between safety and cost or between safety and operation, do managers discuss with staff members how it is resolved?

Guide Questions:
- When situations arise that require a decision between commercial/production and safety considerations, who decides?
- Would you or your colleagues be consulted?
- If the plant were stopped owing to a faulty component and you had to have a replacement part to complete the job and only a substitute of a lower standard was available, what would you do to get the plant back into production again with a minimum of delay?

Note: Managers' attitudes are demonstrated and staff attitudes are influenced, by exchanges on nuclear safety matters. In particular, the opportunity to demonstrate that safety will be placed before production should be apparent to all individuals.

Key Indicators:
- Discussions with staff concerned about delays in restarting the plant for reasons of safety.
- A clear commitment to safety is a primary objective.
- Involvement, discussion, reasons for decisions affecting safety.
- Examples of production delayed for safety reasons reinforces the safety culture.

Q2 (RMI)

Basic INSAG Question: Are the schedules and content of work for annual shutdowns examined by an internal safety review process?

Guide Question: How is the content of the outage work list arrived at?

Note: The aim is to reveal whether shutdown work lists are influenced by previous experience both from the site and from other similar plants. Also, to find out whether there is scrutiny of the work list by some third party safety review process and whether this leads to amendments to the list on the basis of safety considerations.