

O&M Engineering **Directory**



INTEGRATED **S**ERVICE **S**OLUTIONS



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CHAPTER
1

Introduction

Maintenance is the combination of all those technical and administrative actions, including supervisory actions, having the purpose of maintaining or restoring an item to a status allowing it to execute the required function (UNI 9910 definition).

ISS International offers completed and integrated O&M Engineering Services mainly for Oil & Gas and Power Generation industry.

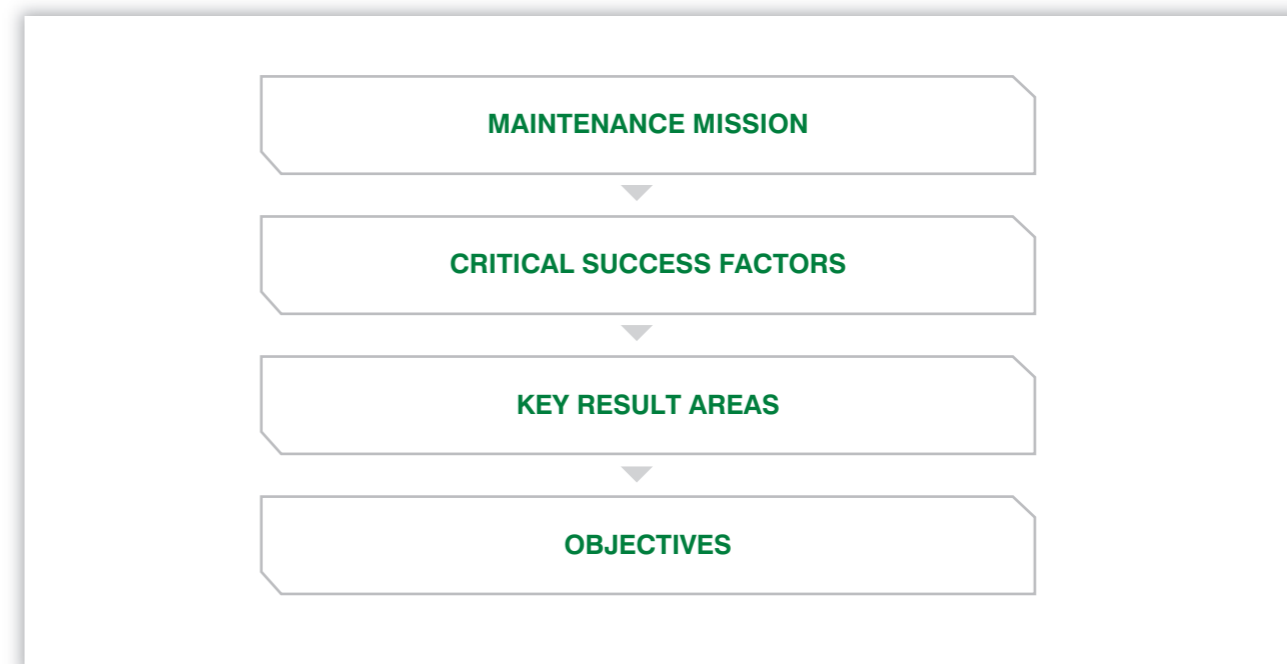
ISS International supplies services and develops innovative solutions (Dynamic Simulation) to improve Maintenance Activities linked to Plant Design and Profitability.

CHAPTER
2

O&M Policy

Maintenance is on its way to becoming more and more an essential engineering activity that it starts by the conceptual phase of plant and it lasts for all its life cycle until its decommissioning. For this reason, it must be planned carefully as multidisciplinary engineering activity.

In order to support the Company's business and production operational objectives, a clear statement of what maintenance has to achieve must be stated: this provides a set of objectives. Objectives must be considered at various levels as defined in the below Figure.





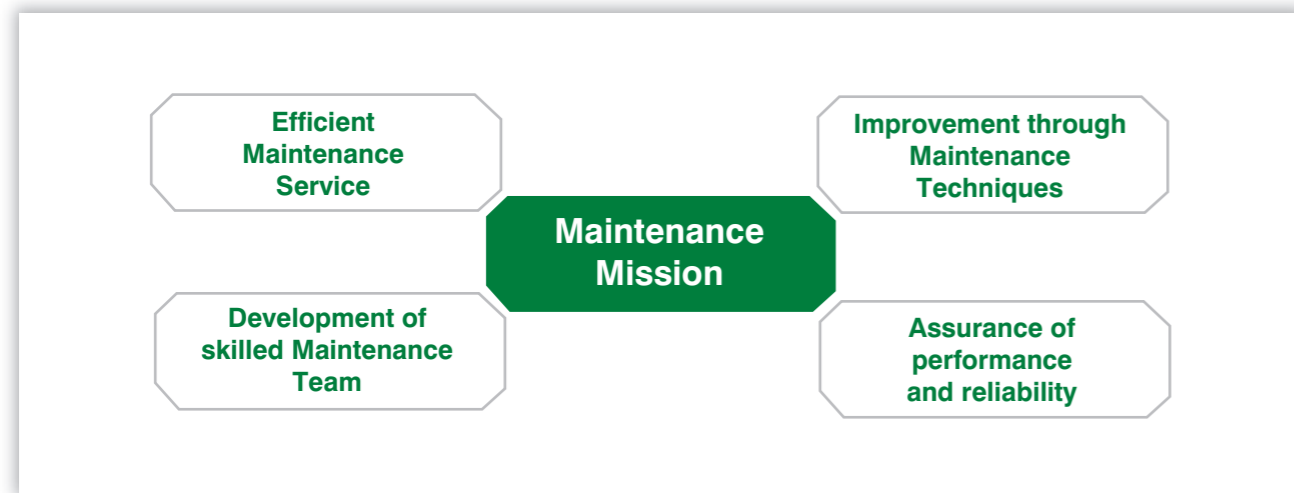
2.1 MAINTENANCE MISSION

According to the above definition the Company's overall maintenance objective should be stated as:

- To provide an effective maintenance service to support production which meets customer requirements (production, operations) while complying with all legal, health, safety and environmental standards in a cost effective manner.
- To ensure all plant and equipment operate at required performance and reliability levels by the application

of preventive maintenance and to adopt predictive maintenance techniques where cost effective.

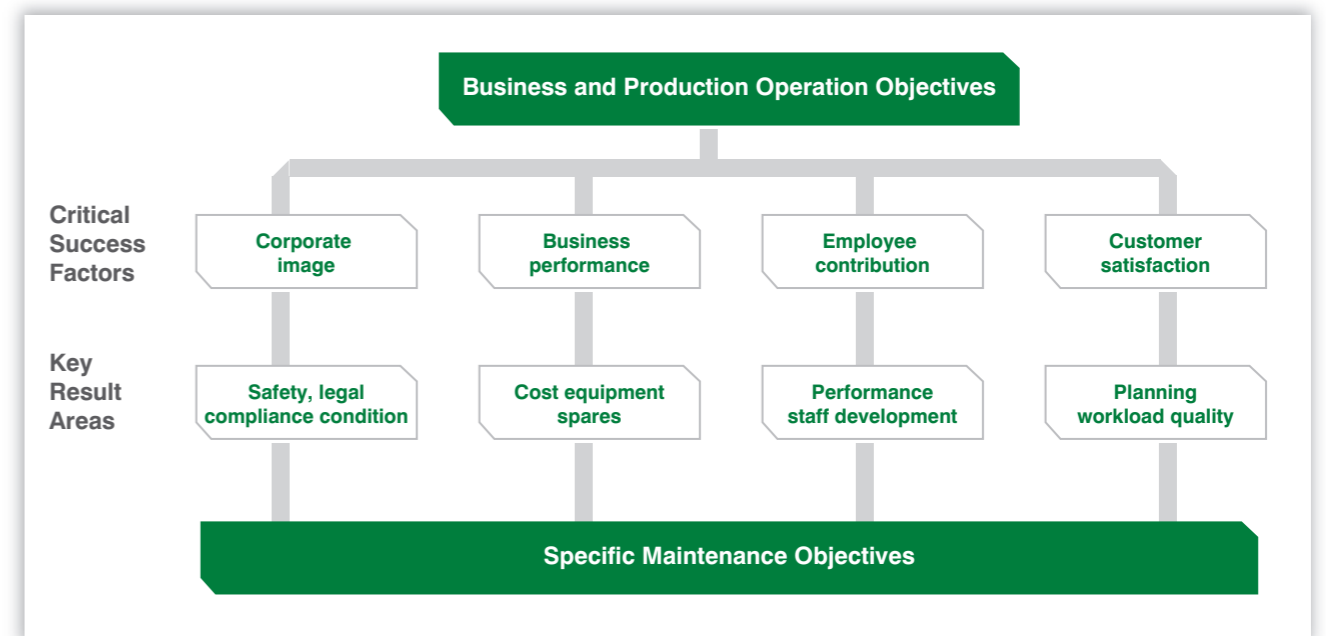
- To take action to improve reliability of plant and equipment through problem solving and failure analysis techniques with processes of continuous improvement.
- To develop a highly skilled team which maximises value to both the employees and the Company.



2.2 CRITICAL SUCCESS FACTORS AND KEY RESULT AREAS

From the above Maintenance Mission a number of key result areas has been defined and classified by four categories of critical success factors (see Figure below).

These critical success factors allow the maintenance function to demonstrate their contribution to the Company's business and production operation's objectives.





2.3 OBJECTIVES

Concerning either productive and economic objective, it needs to guarantee the availability of Plants and Equipment to Production, so that it is possible to perform their service under the best conditions.

In order to execute Maintenance Activity in the best way, it is essential to take into account the following objectives:

- Protect and preserve the Technical Integrity of plant, systems and equipment.
- Define all risks resulting from design or operational activities and mitigate them to an acceptable level in accordance with local legislation and International Standards.
- Ensure and optimise the availability of the facilities systems and equipment through systematic use of analysis and performance improvement techniques.
- Identify and implement non-intrusive maintenance activities, wherever possible.
- Provide an auditable system of asset maintenance and control.
- Ensure spares holding is optimised consistent with availability requirements.
- Control the performance of maintenance in an efficient and safe manner such that economical, safe, and reliable plant operation is achieved.

CHAPTER 3

O&M Activities

Thanks to its qualified personnel, **ISS International** may provide a full range of process services relevant to maintenance operation to its Client.

The professional figures, at ISS International's disposal, can cover the following main maintenance activities:

Maintenance Studies

- RAM Analyst
- Plant Availability Engineer
- RCM Engineer
- RBI Engineer
- Risk Analyses Engineer

O&M Activities

- Maintenance Engineer for Maintenance Specification / Philosophy / Strategy
- Maintenance Engineer for maintenance & inspection plans
- Maintenance Engineer for Operating Procedure and Maintenance manual
- Maintenance Engineering for Operability and Maintainability support during Project Design / Review / Hazop

- Maintenance Engineer for Data Collection and MEL
- Maintenance Engineer for BOM's and SPIL
- Maintenance Engineer for CMMS implementation
- Maintenance Engineer for CMMS management (planning, scheduling, etc.)
- Maintenance Engineer for operator/maintenance technicians
- ...



CHAPTER
4

O&M Engineering Services

ISS International operates and maintains production facilities on behalf of the “asset owner”. Our vision for this business is to operate multiple client facilities at minimum operating costs through innovative operations and maintenance strategies and human resource sharing between clients, to be the preferred contract operator both in Italy and in the international context.

ISS International provides cost effective facility operations and maintenance services. We also provide a broad range of technical, administrative and regulatory interface services for customers wherever their plants are located. Our HSE-Q unit continually monitor our performance against our internal health, safety, environmental and quality management standards to ensure world’s best practice is maintained. Our competitive advantage in contract operations is our capacity to maintain a culture within our team where risk identification and mitigation is unambiguously embraced as the top priority. Risks and reliability are closely related.

ISS International Operation & Maintenance services are based on policies embracing Total Reliability and Maintainability concepts, worked out by our Operations and Maintenance Engineering unit.

The most common reasons for obtaining maintenance support services may include:

- Optimization and availability of all plant item;
- Cost reduction or cost stability achievement;
- A lack of available expertise and resources by customer or user;
- Low frequency of maintenance activities;
- Lower costs due to economies of scale that can be achieved by a service provider;
- Higher level of expertise available from equipment manufacturer.

The provision of maintenance services should comply with the following principles:

- **Aligned with international best practices.** The maintenance services should make use and formally refer to commonly recognised industry best practices. In particular, quality assurance and quality management standards.
- **Standardisation of terminology.** The service provider and the Company should make sure that they speak a common language and is aligned with International industry terminology. This leads to optimise communication at every step of the process.
- **Flexibility.** The maintenance agreements should embed the necessary flexibility for effectively managing different projects in terms of complexity, costs, and Investments difficulty.

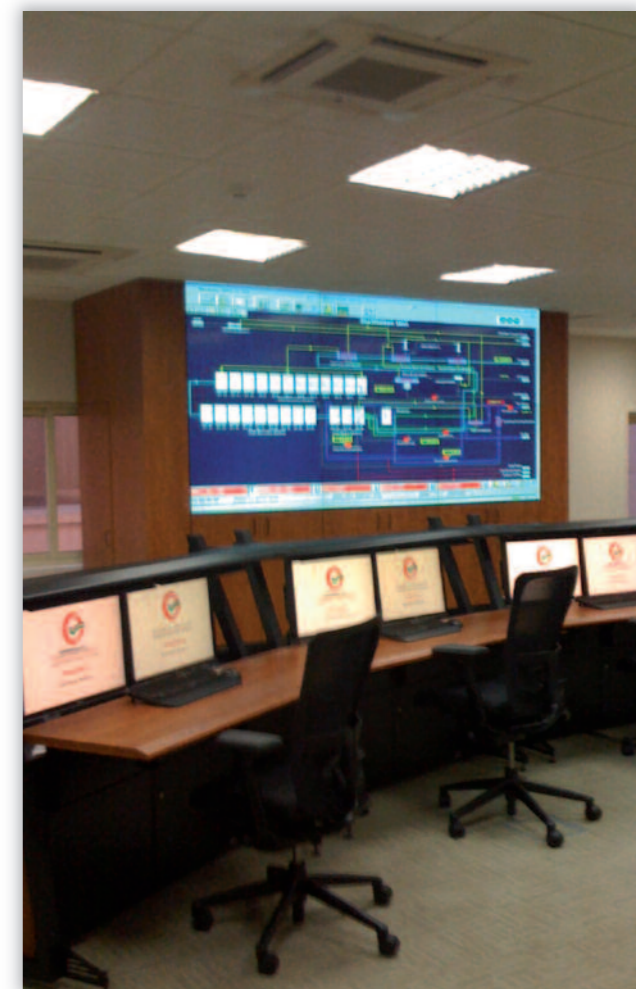
- **In line with local rules and regulations.** The service provider should make sure that its services are in line with the country where the services are executed. In particular health, safety and environment issues.

The scope of the maintenance support services may span for the simple provisions of labourers, i.e. on call basis, to the supply of a full maintenance global services, which is by definition a long terms service.

Externally provided maintenance support services can be divided into three major categories:

- Basic maintenance support agreements
- Limited service agreements
- Long term service agreements (LTSA).

Typically, the lowest level of maintenance support service is provided on the basis of a specific needs, normally for a specific type of equipment discipline or manufacturer of hardware and software. Manufacturers traditionally provide these basic services to support their products. Limited service agreements and LTSA’s are generally applicable to major equipment, systems or facilities. They consist of many of the service components at the lowest level but in addition, include performance guarantees and a specifically tailored agreement.





4.1 O&M MANAGEMENT SYSTEM

ISS International operates a comprehensive Services Management System (SMS) for each of its O&M contracts.

The main elements of our SMS Standard are outlined below:

- Policies and Objectives
- Organisation and Responsibilities
- Information Management and Control
- Risk Assessment and Risk Management
- Operating Procedures
- Employee (and Community) Involvement
- Employee Selection, Competency and Training

- Employee Health
- Contractor and Support Services
- Design, Construction and Commissioning
- Procurement
- Maintenance, Inspection, Testing and Modifications
- Change Management
- Emergency Response
- Incident Reporting and Investigation
- Managing Materials
- Decommissioning and Abandonment
- Performance Audit and Review.

4.2 O&M MANUALS AND SOP/POG

ISS International develops maintenance manuals and procedures providing a product / service as follows:

- Detailed Reference for Operation & Maintenance Personnel
- Easily Accessible
- Full Comprehensive Information
- Easily Update
- Suitable for New Communication Technology.

The scope of a maintenance manual is to enable the operator's maintenance personnel to carry out their duties at a high level of safety.

The manual should include detailed instructions for accomplishing inspection and maintenance functions. It should also include forms, instructions, and references for recurring non-routine requirements.

Normally, **ISS International** develops Maintenance Manuals and relevant Procedures on the basis of the following main points:

- Plant General Description
- General Facility Information
- Emergency Procedures Plan
- General Operations & Safety Requirements
- Plant Operations Procedures
- General Maintenance and Inspection Requirements
 - Maintenance Manuals
 - Maintenance Procedures
- Maintenance & Inspection Checklist Procedure
- Maintenance of Fire Protection Equipment
- HSE Impact.

4.3 O&M TECHNICAL ASSISTANCE

ISS International provides practical hands-on operations and maintenance support across a broad range of disciplines with our experience of commissioning and start-up, production optimisation, control systems optimisation, maintenance and inspection, asset integrity assurance, troubleshooting and incident analy-

sis as well as our other services. We develop, implement and monitor improvements to operability and safety, ultimately increasing profitability of your asset. We provide immediate response to production critical problems, out-of-hours if required, with the backup of the ISS and its Group Companies.

4.4 O&M STAFF TRAINING AND KNOW-HOW TRANSFER

ISS International has extensive knowledge in Operations and Maintenance Management for Upstream and Downstream Oil and Gas Operations both at national level and Internationally. ISS International can establish the optimum team to operate and maintain the field and identify competency required. Develop and implement recruitment and training plans to suit client's requirements. These unique services can be implemented into a Brownfield or Greenfield environment.

With this a leveraged synergy allows full access to professional back-up and support for innovation transfer.

ISS International knows how led solutions are supported by an operating capability from our well experienced staff and tools (O&MTS). This ensures that technical solutions offered to clients, also can be set in the context of organisational and human factors, as well as operational process parameters and maintenance issues.

4.5 SOFTWARE SERVICES

ISS International provides engineering services that involve our team to use software that are able to monitor and improve the efficiency of maintenance operation.

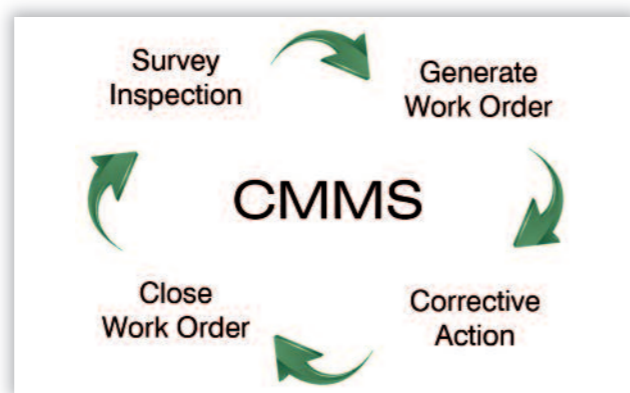
ISS International engineering support covers the following main application fields:

CMMS

The Computerised Maintenance Management System (CMMS) is a tool which will be used for planning, optimising, and implementing maintenance work to be carried out by maintenance teams of competent individuals. The CMMS system will be used for materi-



als management, the control of repairs, identifying maintenance activities which are overdue, planning time based inspections and optimising the availability of systems and equipment through systematic use of analysis and performance improvement techniques. The main objectives of the CMMS are to ensure safe operations of the facilities, to retain the design integrity of the facilities and to improve the plant performance. Compliance with these three main strategies will help to ensure Production Operations Integrity.



RISKWISE

It is an Advanced code-compliant Risk-based Inspection (RBI) software for optimising plant inspection and maintenance. Riskwise software provides remaining life indicators (RLI) in generic manner covering all damage

mechanisms and it evaluates a risk profile for the plant. It is specified for the development of upstream and downstream, onshore and offshore process pressure equipment such as vessels, columns, fired heaters, piping, pumps, exchanges, tanks and relief valves.



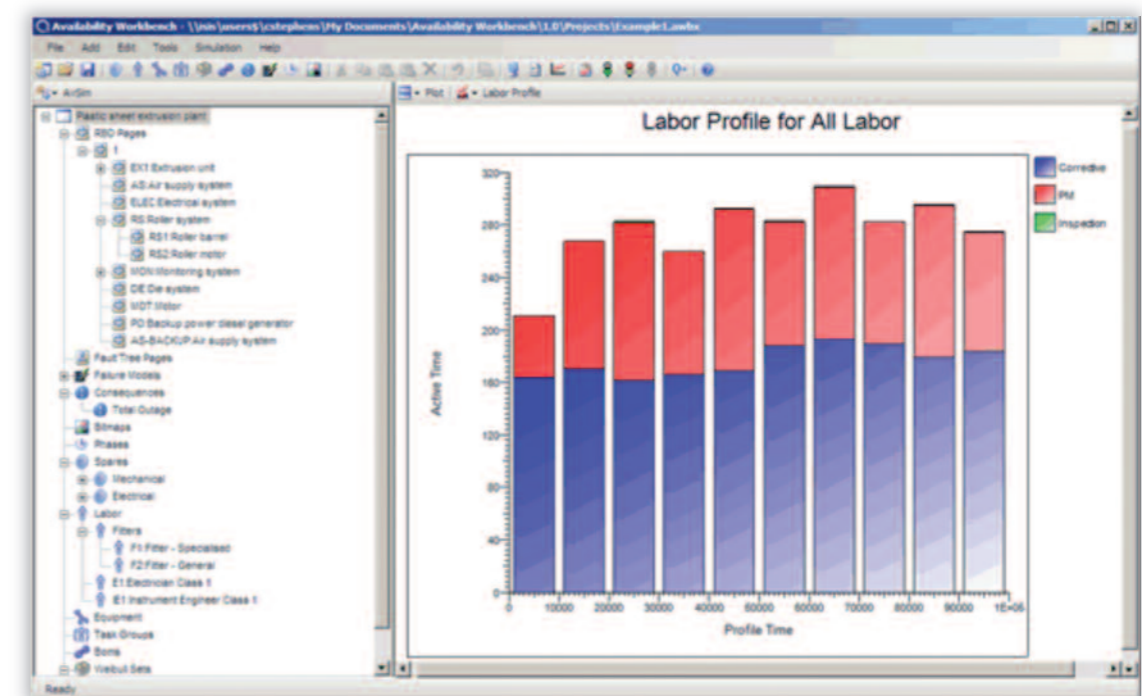
RB.EYE

RB.ey software has been developed to support the RBI calculation, the optimization of the RBI strategy and the delivery of an inspection strategy report.

AV SIM

The AvSim module is a powerful system reliability and availability simulator. It is capable of analyzing complex and dependent systems, enabling you optimization of your reliability and maintenance strategy. In AvSim the logical interaction of failures, and how they affect system performance, are modeled using a reliability block diagram or fault tree. These diagrams may be used to model failure and success or levels of throughput in the system.

Consequences are then assigned to any level of the logical diagram to indicate the effects of failures (financial, operational, safety and environmental). Labour, spares and failure data may be imported or directly entered into the program together with any operational phase information and task group assignments. The AvSim maintenance software module will then analyze your system using efficient Monte Carlo simulation algorithms to provide availability and reliability parameters, life cycle costs, importance rankings etc. It is also possible to optimize spare holdings and planned maintenance intervals. All this information may be reported in standard (or custom) graphs and text reports or exported to your database or spreadsheet application.

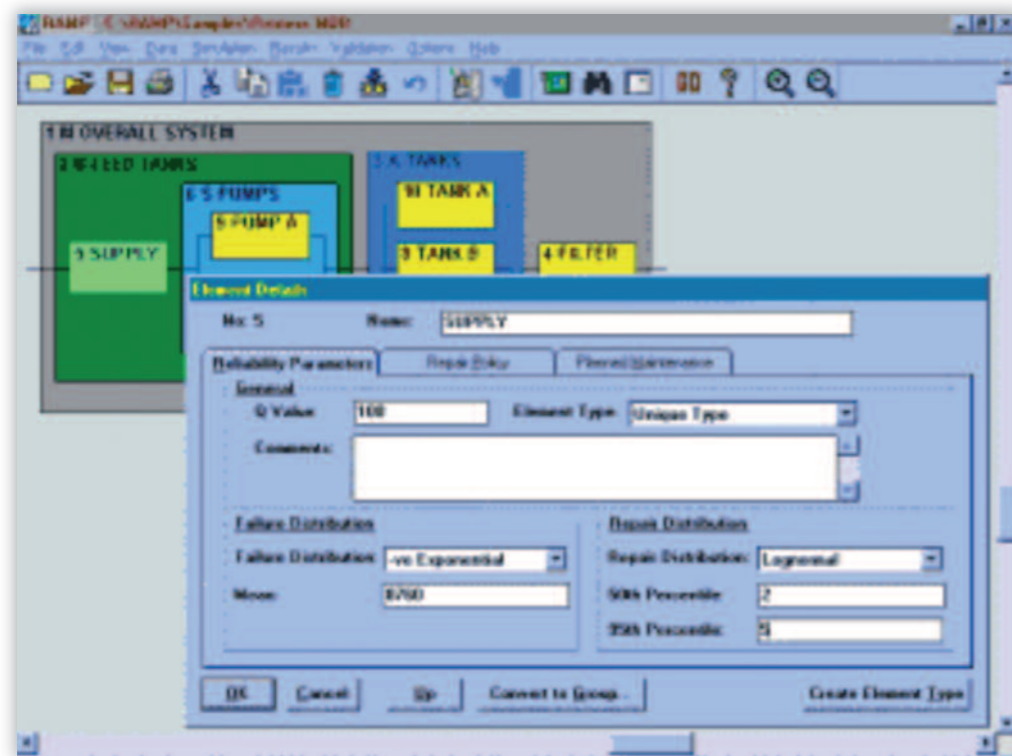




RAMP

RAMP is a powerful availability modelling package developed specifically for the analysis of process systems. RAMP models the effects of scheduled and unscheduled downtime on process throughput, establishing relationships between equipment reliability, configuration, maintenance strategy, spares and resources.

RAMP is a simulation programme capable of modelling simple or complex process systems of all types. RAMP models are used to support critical decision making such as redundant capacity, buffer storage, reduction of through-life costs, equipment procurement specification, criticality and cost-benefit analysis.



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