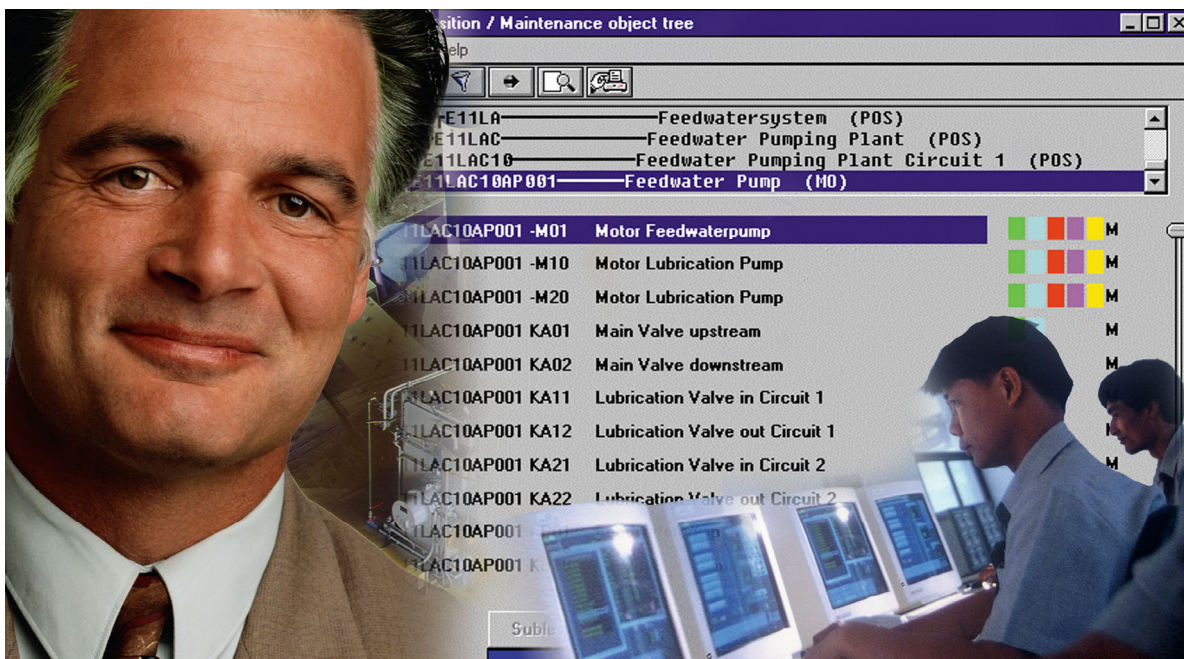


# Maintenance Management with APIpro

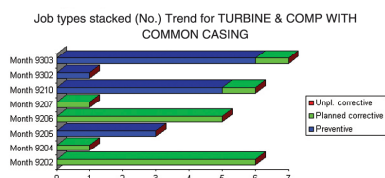
## Optimax Maintenance Products



### Introduction

The objective of maintenance activities is to achieve a high level of availability, performance and safety of the plant. This gives rise to a variety of tasks that must be performed in accordance with official approvals, pertinent laws, directives and regulations. This applies to current plant operation but is particularly valid for modifications, extensions and the construction of new plant due to the performance improvements and the increasing level of system automation achieved by such measures.

Work preparation and planned condition-based maintenance are becoming increasingly important for the reduction of plant downtime costs. In order to meet these requirements, it is recommended to use a **Computerized Maintenance Management System (CMMS)**.



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### Features

The **APIpro** CMMS holds the complete and fully integrated maintenance management functionality. The full integration between modules and with other systems is essential. Thus an important part of the inefficient cross-organization communication and paper interchange can be eliminated. APIpro is an efficient tool designed to generate continuous improvement by improving maintenance planning, improving utilization of human and financial resources and by improving overall quality.

### Describing the Plant Structure

APIpro has two ways to describe your plant structure. You can use the position system to generate a plant position structure, and the maintenance object system to generate a structure of machine individuals. Both systems can be defined with an unlimited tree-structure. The advantage comes when combining these two systems, by linking maintenance object individuals or structures into the position structure.

You will then have the possibility to define the fixed plant installations in the position structure and the detailed machinery and equipment information with the maintenance objects or even tree-structures of machines and their sub-assemblies as indicated in Fig. 1.

In this way the user will obtain the best of two worlds: a full documentation and history by each plant position or its branch of the tree-structure, and at the same time a full documentation of movements, cost and maintenance history of individual maintenance objects moved around in your plant or even to stock.

APIpro has no limitations or predefined rules about the plant structure implementation, you just enter your plant as it is. All information searching and history analysis tools in APIpro can directly work with the plant structure you define. Plant documentation also includes spare parts and their parts lists connected to individual maintenance objects, or shared among multiple technically identical objects. Parts lists can even be split with some parts individually assigned and others assigned via the technical ID system, for maximum flexibility on almost identical objects. Any item on a parts list can have its own

position in order to specify exactly where it is situated or to make the documentation consistent with drawings etc.

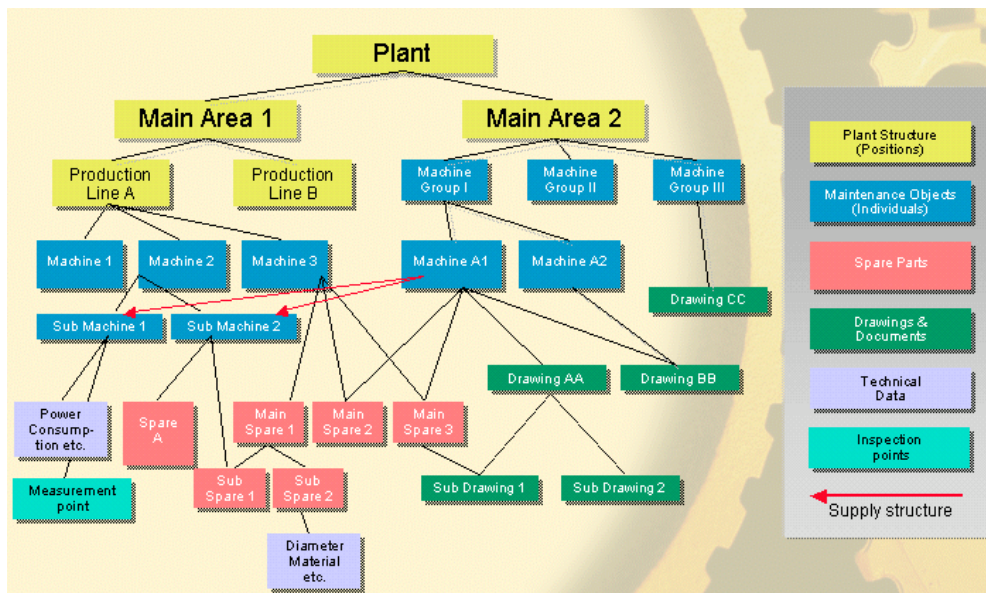


Fig. 1: Example of a CMMS structure

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Parts lists can be created automatically on maintenance objects either via the work order system, the stock control or the purchase management system. Parts can be defined as spare parts or consumable material in order to add only relevant parts to the parts list. This feature can speed up the plant documentation process.

The technical specification system holds the detailed technical data for maintenance objects and spare parts. You can freely define the technical data in templates, with description, numerical, text or date information as well as a unit designation. The required technical data can then quickly be entered for each object.

You can search for spares, material and/or maintenance objects according to one or multiple technical specifications.

### The Numbering Concept

To further improve implementation and flexibility APIpro is able to handle any numbering structure you like. A standard numbering system already used in your company can easily be entered. The plant structure is independent of the numbering structure chosen. Already used numbers and identification codes can be changed consistently throughout the APIpro system at any time.

### The Basic System Module

Efficient information searching requires a tool where you can see relevant information at any time and without knowing exact key numbers etc. to search for. The APIpro Plant Explorer provides information searching based on limited or no key information and with multiple criteria. Searching for specific spare parts or maintenance objects according to technical

specifications can be done easily. APIpro also includes system-wide “included-in” searching, providing immediate access to see where a specified spare part is used etc.

From the plant structure information searching you can access parts lists, planned work orders, work order history, inspections, drawings and documents and any other information connected to the plant position structure or maintenance

object individuals. When surveying parts lists you can even see stock status information and active purchase orders. This depends on the Basic Modules and the Add-on Modules installed on your system, as indicated in [Fig. 2](#).

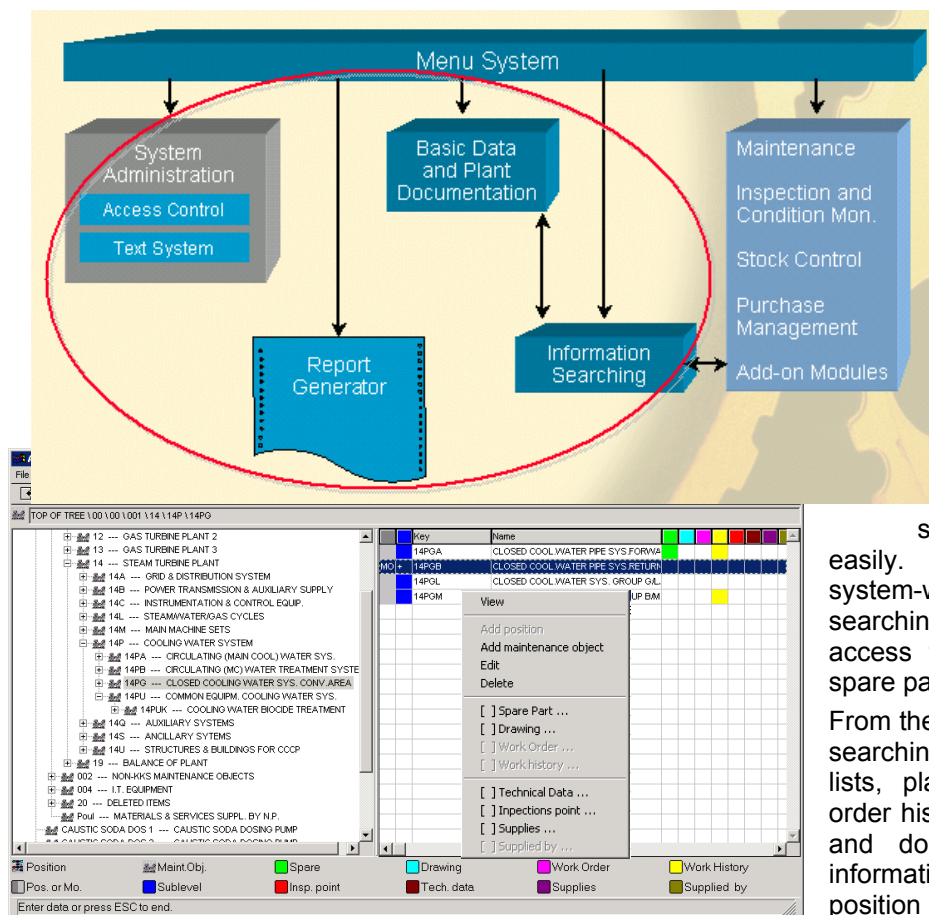


Fig. 2: The Basic System and the CMMS Plant Explorer

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The APIpro information structure is created instantly. You just work with the APIpro system and the information structure with its complex relations between data will be created automatically, already from the first day of use.

### The Maintenance Module

The APIpro Maintenance module is the functional core of the APIpro maintenance management system. With the maintenance module you can handle all kinds of maintenance activities, either initiated directly from the maintenance module or from one of the other APIpro modules. Maintenance activities typically are:

- Unplanned breakdown maintenance.
- Unplanned maintenance ordered by operators.
- Planned corrective maintenance.
- Inspections rounds.
- Condition based maintenance.
- Calendar based preventive maintenance and overhauls.
- Meter/event based preventive maintenance and overhauls.
- Large scale overhaul projects.

The module covers work order generation with allocation of spare parts, material and work resources, an extensive work instruction system, advanced work order planning features, registration of activities, failure information, consumption of spare parts, material and working hours as well as the complete range of analysis functions.

### Work Instructions in a Tree Structure

Standard work instructions can be utilized to create work instructions for a work order. Work instructions are entered in the flexible notepad format similar to a word processor with full cut and paste functionality to/from other text sections. Multiple work instructions can be connected to each other in a tree structure. This means that the maintenance instruction for e.g. an electrical motor overhaul only needs to be **created once**, and then **reused in multiple** maintenance procedures or work instruction structures including an electrical motor overhaul.

### Planning of Jobs

Advanced planning tools are available to allocate the resources needed for maintenance and to see when the plant/equipment is available for

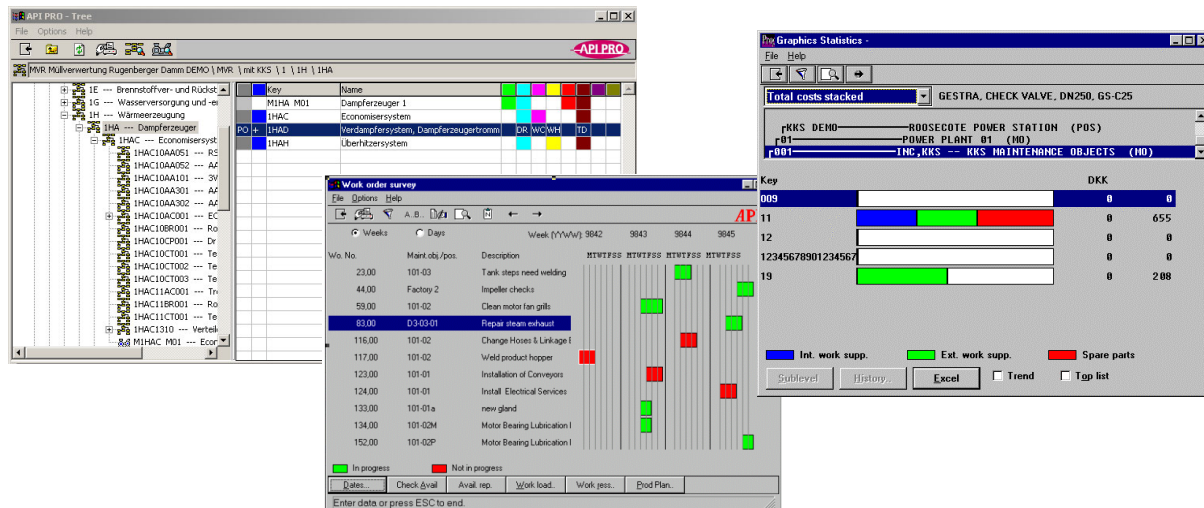


Fig. 3: Work Flow and Job Orders

maintenance. APIpro contains several programs for the planning of work orders. Through the accumulation of work orders it is easy to find out exactly what to execute in case of for instance an unplanned stop over a limited time period in a specific part of the plant. The system

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automatically considers all the unplanned, planned and/or preventive jobs within the stated interval. Even for daily, weekly or monthly planning (Fig. 3) the accumulation is a powerful tool to find the relevant jobs. A flexible filter with all parameters available controls the result of the accumulation. For both the work order accumulation and the work order survey systems, you have full access to the maintenance work order details. You can directly see the on-line workload of departments and people with overload warnings and features for re-planning to improve resource utilization. You can also directly see the availability of spare parts and material planned for use, via access to the stock control and purchasing modules. Availability problems for spare parts and material are detected immediately and reported. This is integrated planning, providing you with the overview required for an optimized result.

waiting for work resources, stopped, delayed and waiting for registration. In addition you can add your own work order status identifications, modify the predefined ones and even break manually into the flow when required.

### Feedback of Work Orders

Work order registration lets you enter stop and waiting times, error codes, work resources used, spare parts and material used as well as a free text notes section for whatever additional information you find valuable for you or others to know in the future. When used integrated with the APIpro stock and purchase modules, you will find work order registration even easier. Removal of spares and material to a work order as well as direct purchasing to a work order will be registered as consumption to the work order immediately when removed from stock or delivered.

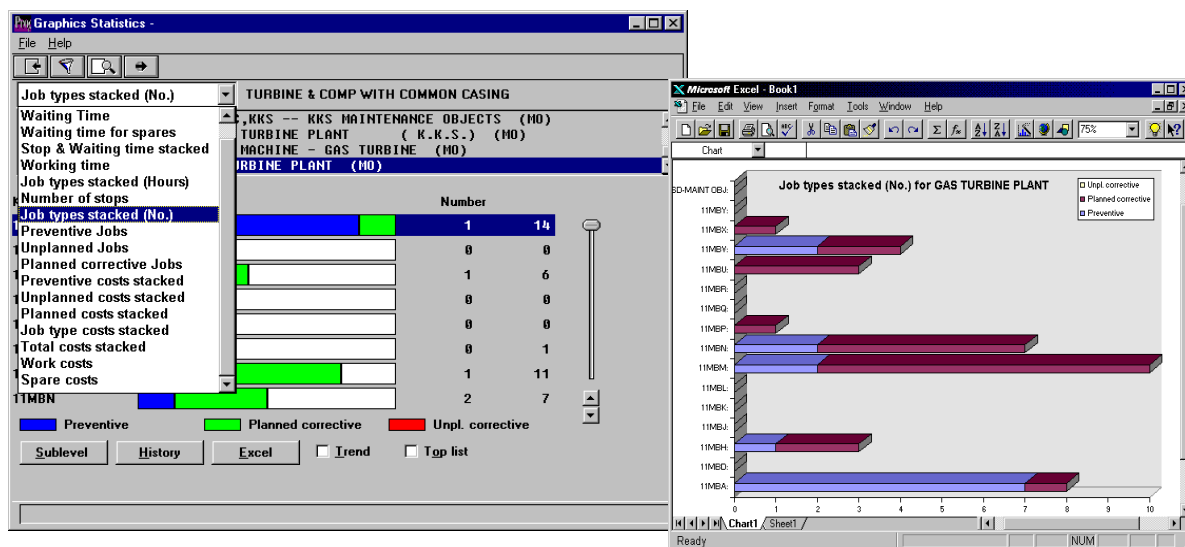


Fig. 4: Work order feedback

### Work Flow Management

With APIpro you have access to work flow management functionality when handling maintenance activities. APIpro will log all planning related changes made to a work order, from start to finish. All maintenance work orders can follow a status development, from being initiated, to planned, started, waiting for spares,

Consumption of resources, spares, material and working hours are committed immediately, and will be directly available in the history analysis.

The plant structure analysis, the error code analysis and the accounting structure analysis all features the direct access to MS-Excel for further graphical presentation by just clicking the Excel button (Fig. 4).

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### The User Interface

In addition to the powerful search and browse features briefly mentioned above, the APIpro user interface allows exporting selected data to external standard programs such as MS Excel, MS Word or other programs by opening the program directly with the data exported from APIpro. The information can then be edited and saved in the actual format. It is also possible to export directly to the so-called XML format. Here purchase orders for suppliers can also be printed.

The APIpro screen designer feature allows you to design individual screen layouts by each user or by a group of users in order to fit your company needs and the specific requirements of each part of the organization. The user can move, delete and resize fields on data entry screens.

### List of available APIpro Modules

APIpro is built with a modular structure, allowing each installation only to install the functionality required. At the same time, the flexible modular structure lets your APIpro system grow with your needs. The following sections of this description will provide an overview of the functionality available for this project. For any APIpro implementation the **Basic System module** (item 2.1 in the table below) is mandatory. In addition to the plant documentation and information searching features, this module holds the entire system administration functionality.

Depending on the project requirements, one or more *Basic Modules* can be required, combined with one or more *Add-on Modules*.

### Basic Modules

- 2.1 **Basic System** – Plant Documentation
- 2.2 Maintenance – Planning, History Resources
- 2.3 Inspection, Condition Monitoring, Rounds
- 2.4 Stock Control
- 2.5 Purchase Management

### Add-on Modules

- 3.1 Job Ordering
- 3.2 Internal Purchase Requests
- 3.3 Purchase Agreement
- 3.4 Drawings & Technical Documents
- 3.6 Production Calendar
- 3.7 Palm Pilot Interface Module
- 3.8 Barcode & Portable Dataloggers
- 3.10 Tools Management
- 3.13 Project Management
- 3.14 Calibration
- 3.15 Data Import Module
- 3.16 Interfacing (incl. 3.15 Import Module)
- 3.17 Messaging
- 3.19 Advanced Planning Module
- 3.20 Graphical Navigator
- 3.21 Analysis and Performance Module
- 3.22 Change Logging / Audit Trail
- 3.23 Industrial Interface
- 3.25 Invoicing module
- 3.26 Multi Site Functionality
- 3.27 Multi Company Functionality
- 3.28 Local Language Support
- 3.29 ERP Interfaces



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