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## **Computerized Maintenance Management Information System (CMMIS) In Support of Planning, Scheduling, and Coordination**

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Effective planning, coordination, and scheduling of the maintenance function can be, and for many years was, accomplished without computer support. However, in these days of high technology and rapid, economical data communication, job preparation is accomplished far more efficiently with the support of a sound Computerized Maintenance Information Management System (CMMIS).

Note to maintenance professionals who follow the field: The generally accepted term for maintenance computer systems is Computerized Maintenance Management Systems (CMMS). Computerized Maintenance Management Information Systems (CMMIS) is preferred because current systems by design and by use are not, for the most part, used to manage maintenance but rather to inform about maintenance. Both acronyms are used in this text.

The “I” is inserted into the CMMIS acronym to emphasize that a computerized support system is only an informational tool and is only one building block of an integrated maintenance excellence process. A CMMIS accomplishes nothing in isolation, but must be integrated with the other twenty building blocks of the “Maintenance Arch” (see Introduction). Bottom-line impact results from actions taken on the basis of information provided by the system, not directly from the system itself.

Fast, flexible access to reliable, current, and comprehensive information is vital if planners and managers are to control the maintenance function on the basis of knowledge rather than intuition. Simply put, it is no longer an economically sound decision to manage a function as critical as maintenance without on-line informational support. Computer support is essential if the full potential of the maintenance control system is to be realized. Only on-line transaction processing systems and networks—people and programs simultaneously retrieving and updating information—satisfy the immediacy required by today’s environment.

Integration of the entire Maintenance Arch (Introduction), including the CMMIS, supports and fosters the following:

- Efficiency of maintenance resources (both hourly and salaried), thereby lowering unit cost
- Improvement of responsiveness and service to internal customers
- Improvement of asset reliability, capacity assurance, and equipment up time
- Better delivery performance and product quality to external customers
- Lower unit costs and increased profitability

Computerization of the work order system allows easier access to large amounts of data enabling analyses too time consuming to perform manually.

A popular phrase regarding many CMMIS’s on the market is that they “are not user-friendly.” The statement is true. It is also true that the functions and persons to which the systems are least user-friendly are the planner-schedulers.

The maintenance planning system is generally part of a much larger maintenance information system. It is not the intention in this book to discuss all features and characteristics essential to an effective CMMIS, but to concentrate on those capabilities pertinent to work identification, backlog management, job planning, material procurement, logistical coordination, and weekly scheduling. Of course, planner-schedulers are not the only parties interested in maintenance-associated information.

To effectively support the functions discussed throughout this book, the chosen CMMIS (hardware and software) must offer the following characteristics.

The selected CMMIS must be a sound, comprehensive, on-line, real-time, user-friendly, computerized work order control system. If it is not real time, the maintenance staff (planners and clerks) must perform all administrative input and output. A preferable strategy is for all parties to do their own share of informational input and retrieval.

If these responsibilities are not shared, all too often, planners become little more than clerks. It is a sound investment to take a skilled mechanic off the tools to become a planner but it is a poor investment indeed to take a planner off planning and relegate that person to clerical data entry. It is also a problem for skilled mechanics to take excessive time from being on tools to perform data entry. The design of the system should take advantage of all available technology to minimize the time required for input and retrieval. Remember, if a clerk is doing the entry, the mechanic must first write everything down, make sure it is readable, and ensure that the clerk knows what is being referred to or garbage will get into the system.

There is nothing new in this distribution of responsibility. When work order systems first came into use, well over 50 years ago, people requesting maintenance support were expected to submit a written work order. A Work Order Request now only requires filling in requestor-required fields on a form or a computer screen.

Good backlog management features that enable the quantification, by craft and type, of all open work orders, are essential. These features relate essentially to effective coding regarding:

- “Job Status” to facilitate the planner’s efforts to keep all work orders moving to completion rather than allowing them to bog down in a state of limbo.
- “Assigned Team” to facilitate the preparation of a weekly schedule fully deploying the resources reporting to each given supervisor.
- “Asset/Equipment” to facilitate the assembly of all ready-to-go backlog that might be performed during access to a given asset.
- “Requestor” to keep internal customers apprised as to the current status of their requests. Ideally, requestors should be able to access this information themselves, on-line.
- “Planner” so that each planner is able to separate his or her work load from the complete backlog.
- “Condition required” because there is regularly a need to separate work that is doable at any time versus that requiring asset down time, of various duration (a few hours, a weekend, periodic programmed access, annual shutdown, etc.)

Features in CMMIS that support effective planning and estimating include:

- Macro-planning to keep resources in balance with the workload. That is, screens to allow calculation of available hours, and deductions for projected PMs and provide an estimate for break down hours. The macro-plan then calculates capacity available for backlog relief. This is called the Work Program process (Chapter 6).
- System capability to store, retrieve, modify, and copy previously developed job plans and estimates from history or planner libraries.
- When planning a job on a specific asset, ready access to related information without backing out of the planning module. Being able to cut and paste is useful. The information in question includes previously cataloged:
  - Job Steps
  - Bills of Material cataloged by machine and major component
  - Current available inventory with capability to reserve same
  - Job Estimates
  - Pertinent safety and environmental procedures, instructions,

- permits and authorization (hot work, isolation, lockout/tag out, pre- and post-maintenance valve and switch lineups, etc.)
- System linkage to current drawings and other reference documents with provision for automatic attachment to planned job packages.

Effective materials management features are essential. Problems in this area are common and constantly threaten mechanic's productivity.

- Cross references
  - Bill Of Materials (BOM) of components by asset.
  - Conversions between manufacturer's part numbers, vendor's part numbers and storeroom item numbers
- Reservation (allocation) of inventory item units to specific planned jobs and release (de-allocation) of same as needed
- Reliable replenishment of authorized stock
- Prompt processing of purchase order requests for direct purchases
- Prompt and reliable notification of receipts

In addition to system capabilities there are practices that make the system work effectively. Below are some effective scheduling procedures:

- Annualized leveling of PM/PdM's with notification as they come due
- Ability to call forward approaching PM's to take advantage of known asset access
- Weekly scheduling for each crew by job, day of the week, and individual to whom job is aligned
- Linkage to project management software
- Good reporting features including Backlog Status, Work Programs, Schedule Compliance, Crew Efficiency, and Age of Reserved Inventory