Introduction To Plating/Anodizing and Pollution Control

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The modern plater, faced as he is with the problems of maintaining high output at low cost, cannot afford unnecessary rejects. Production schedules often will not tolerate waiting for an outside expert to arrive. Solving problems by dumping and rebuilding some or all of the solutions is no longer a practical approach. Material and waste disposal costs have made such a solution economically impossible. If he is to be successful, the plater has to recognize that for 90 pct of his problems, he must be his own troubleshooter, and become good at it.

"Prevention is the best cure" may be a cliche, but it will remain forever valid in the plating room. A good plating troubleshooter not only tries to solve his on-line problems, but he also designs operational procedures and control systems so that problems do not occur in the first place.

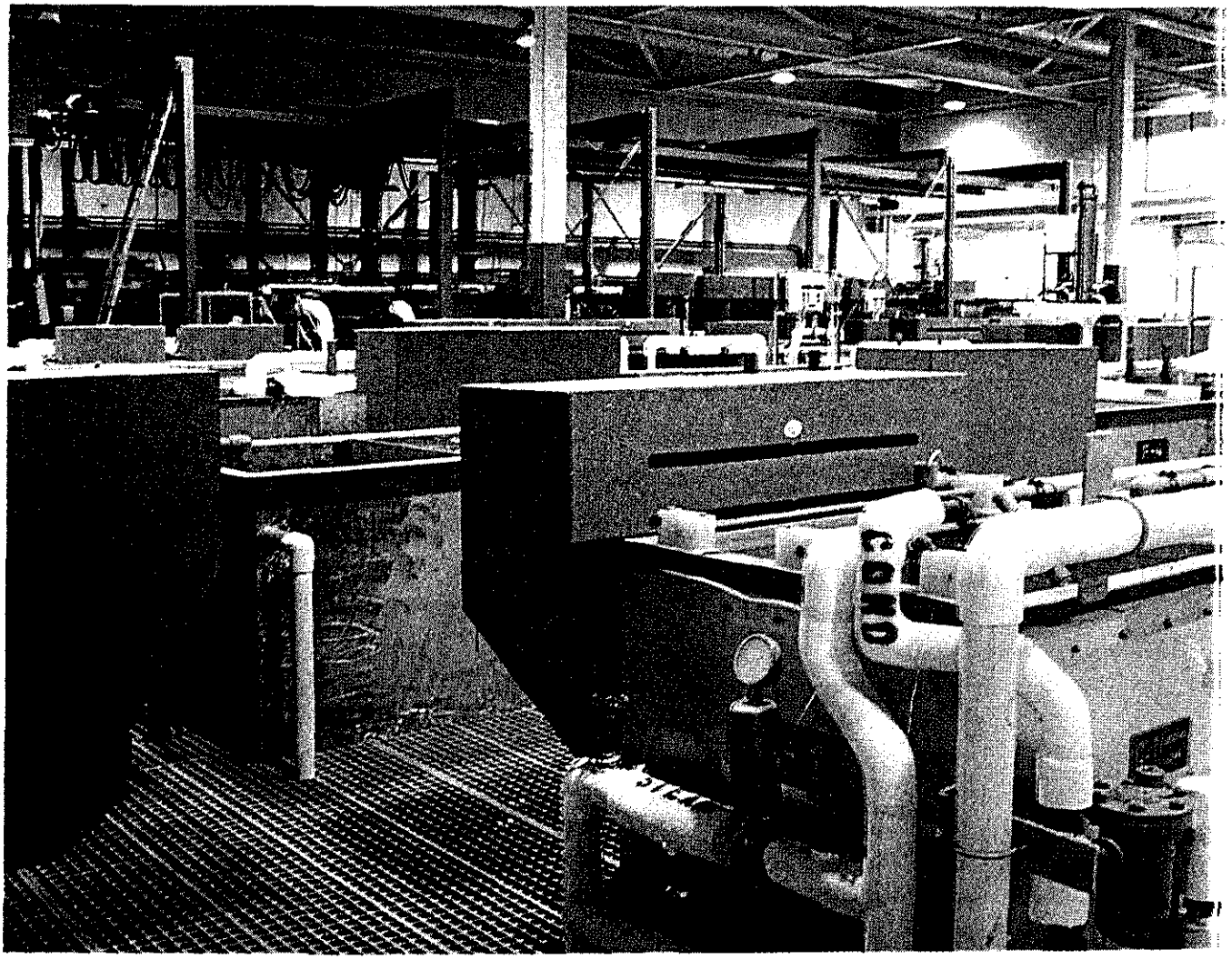
An old plater's rule of thumb said that 95 pct of all plating problems weren't plating problems at all: they were people problems. Someone failed to do something, and as a result, a solution went out of balance, a part wasn't properly prepared for plating, a filter wasn't cleaned and so on.

An important step, therefore, is to have a good preventive maintenance program —a series of checks and rechecks to insure that everything happens on schedule. Such a program would include regular analysis of the plating solutions (including all the critical preplating solutions such as cleaners, acids, descalers or others); a record of the results; and a regular review of this record.

There should be a fail-safe method of assuring that additions, if called for, are made, and made properly. If they are not made, a note of the fact and the reasons why must be recorded. The reviewer must not be misled by inaccurate records. He should be able to look for trends that might predict potential trouble, and not be misled by omissions.

It is helpful to graph the more important variables, so that any trend may be recognized more quickly.

With increasing emphasis on "closed looping" and recycling, the use of countercurrent rinsing to cut water flows, and reclaim tanks to lower dragout is becom-



WELL DESIGNED plating room is brightly lighted, has floor grates that keep walking surfaces dry, is equipped with ventilation system that quickly captures fumes from process tanks. (Photo courtesy Burns & McDonnel, P.E., Kansas City, Missouri.)

ing common. In most cases, all or most of the solution is returned to the processing tank. Various purification methods are used as part of these reclamation systems, and must be checked on a regular schedule for proper operation. Operational failure of one of these systems could lead to heavy contamination of the processing solution with severe production problems.

The numbers and types of rejects should be recorded and analyzed in a similar way. Slowly increasing rejection rates often go unnoticed until they become a serious problem. Proper record keeping and analysis will allow corrective action before the problem escalates. Accurate data on normal rejection percentages and types is needed as a base to evaluate any corrective measures taken when trouble does occur.

A formal, written schedule for maintenance of all ancillary equipment in the plating room should be kept for filters, pumps, rectifiers, temperature controls—everything. A malfunction of this equipment can cause plating problems. Further, these items represent a considerable capital investment and proper maintenance will assure that they attain their expected useful life.

Cleaning of the area must not be

neglected, either. Now that proper waste handling most often requires piping of the waste to treatment areas, plating-room floors are no longer as thoroughly wetted with conducting salt solutions as they once were. As a result, AC or DC shorts may not be conducted directly to ground, but instead may wander around through the equipment, causing corrosion and/or plating problems.

If despite these precautions trouble still occurs, and sooner or later it will, solving the problem becomes an exercise in applied logic. The fundamental principle of trouble-shooting is that a working system cannot become a non-working system without some change taking place. A corollary of this is that a system cannot work only sometimes without some unrecognized change causing the variability.

With these two principles in mind, the troubleshooter must search out the change that is the source of the problem, and correct it.

To be successful in this relatively simple-sounding procedure, the troubleshooter should have specialized knowledge and training. He should have a thorough knowledge of the equipment and process that is in trouble, or have access to someone who has this knowledge.

Since the troubleshooter is looking for change, something that is different, something that is not what it should be, knowledge of the installation must be visual as well as recorded. Those doing the troubleshooting must know how the unit looks when it is operating properly.

The troubleshooter should be trained in the logic of troubleshooting. Besides on-the-job training (probably the most effective, but also the most time consuming), there are books and courses that can serve as training aids. An excellent reference is "Trouble in Your Tank?" my book about troubleshooting, available postpaid from PRODUCTS FINISHING, 6600 Clough Pike, Cincinnati, Ohio 45244-4090 for $35.00 per copy.

The chapters in this section of the DIRECTORY present much helpful information. Equally important, the *Product Source Directory* following the editorial sections in the DIRECTORY lists the suppliers of all types of equipment and finishing processes. These suppliers are fruitful sources of information about all phases of metal finishing and most will provide whatever help they can.

Near the back of the DIRECTORY there is a list of industry-related associations, many of which either conduct helpful courses or have some form of information service.

And finally, PRODUCTS FINISHING has a service that provides answers to readers' questions: in regular PF issues, "Finishing Clinic," "Coatings Clinic," "Aluminum Finishing Forum," and "Plastic Finishing Forum." Questions sent to the experts who write these columns are answered as quickly as possible by letter (you do not have to wait for the answer to appear in the column).

With all these sources available, the required information can be obtained quickly. Just as a preventive maintenance program is used to prevent trouble, the required troubleshooting information should be collected and coordinated ahead of time. When trouble occurs, the information must be readily available. Preparations should start even before a new or different process is installed.

Preliminary troubleshooting charts should be made up. For plating solutions, a plating test cell library should be prepared and filed for quick access.

The Boy Scout motto is "Be Prepared."

The Coast Guard's motto is similar—"Semper Paratus" "Always Ready."

The successful troubleshooter needs the same attitude. **PFD**

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