

## **MICROWAVE EQUIPMENT MANUFACTURERS VIEWPOINT OF EQUIPMENT ECONOMICS**

Martin Yonnone, Cober Electronics, Inc.

There are a number of key factors critical to the economic success of a commercial microwave system.

- Understanding of the customer's purpose.
- Competing technology.
- Capital cost.
- Impact on the production environment.
  - Floor space savings
  - Energy Savings
  - Special requirements of the microwave system
- Acceptance of the new technology by the plant personnel.
- Special requirements of the microwave system.
- Benefit over the conventional process.
- Process / product quality issues.
- Impact of modern control technologies.

In every commercial microwave process there is almost always a conventional competing technology. The conventional technology is typically less expensive to install and maintain. To make the microwave process viable, it must be an improvement over the conventional process. Quite often, if the microwave process is "as good as" the conventional process it is not sufficient to prove its viability. The customer is looking for a competitive edge.

The microwave process has several obstacles to overcome.

- A. The MW process will likely carry a higher capital cost due to the complexity of the RF components.
- B. The MW process requires special care and feeding.
  - I. Water for cooling of the microwave power supplies
  - II. Training – maintenance, safety and operation.

The benefits of the microwave process can be very substantial.

- A. Improvement in product quality.
- B. Reduction or elimination of scrap.
- C. Conservation of valuable plant space.
- D. Clean (Green) process.
- E. Automation and Data acquisition.

How does the microwave equipment manufacturer optimize the system design to achieve these benefits for his customer.

- A. Careful selection of the size of the microwave power module to be used in the process system.
- B. Selection of the hybrid heating modes.
- C. Materials handling system.
- D. Process control options.