“BEST PRACTICE” MANUFACTURING PRINCIPLES AND PRACTICES

What are the overall cost implications of your adoption of any “best practice” or “lean” manufacturing principles and practices? The subsequent questions should help you refine your answers. Please include any important initiatives, practices, or measures that may have been left out. Provide as much quantifiable data and examples as possible concerning savings and costs of implementation.

Supplier Management

Please tell us in detail about your supplier management programs, including selection, qualification and certification programs, any supplier development programs, strategic alliances, and so forth. In particular, what are the cost implications of any or all of the following?

Other specific questions of interest include:

- Number of suppliers (in 1998 and 1995)
- Percentage of the final product their inputs constitute (in 1998 and 1995)
- Purchased materials and parts dollars as a percentage of product costs (in 1998 and 1995)
Operating costs of your company purchasing activities as a percentage of product costs (in 1998 and 1995)
Purchasing employees as a percent of company employees (in 1998 and 1995)
Purchase dollars spent per active supplier (in 1998 and 1995)
Description of what major components your suppliers produce
Shipments received at facilities on time (in 1998 and 1995)
Items rejected by your inspections (in 1998 and 1995)
Percentage of shipments directly to the factory floor (in 1998 and 1995)
Cycle time to award contract from receipt of requirements (in 1998 and 1995)
Description of any “best-value” (rather than “lowest-cost”) purchases
Number of and description of long-term agreements. Percentage procured under them.
Number of suppliers with whom you have LTAs (in 1998 and 1995)
Description of Supplier Performance rating systems
Description of Electronic Data Interchange (EDI) with suppliers
Description of formal communications program (e.g., supplier councils, newsletters)
Joint design and development
Description of trends in numbers of suppliers and reduction in competition in sourcing materials and parts that you may have experienced.

Factory Operations

Please tell us in detail about the use of lean systems or other new management techniques in running your factory. In particular, detail recent changes, expenses of these changes, and any cost sav-
ings (or cost increases) that resulted. The following list provides some examples of techniques and tools you may have used.

- New information systems
- Statistical Process Control
- ISO 9000/Six Sigma or other quality program
- Just-in-time delivery to the production line/ship to shop
- New machine tools
- Preventative maintenance
- Reduction in floor space due to redesigning manufacturing
- Reduction in travel time of parts during production
- Part-count reduction
- Standardization of parts across products
- Pull production versus push production

Please provide any metrics you use to measure performance, such as flow efficiency (work time/flow time)

Have you engaged in any pilot projects to test “best practice” or “lean manufacturing” techniques? Please describe.

**INVENTORY MANAGEMENT**

Describe your inventory system and practices. Have these changed over the last three years? How so? Have you reduced your inventories over the last few years?

What effect do your inventory strategies have on your supplier management or vice versa?

Please supply **cost data about savings** from your current inventory practices versus previous practices.

Please provide any metrics you use to measure performance, such as

- Scrap and rework cost, as a percentage of total production costs in 1998.
Cycle time from order to delivery.

**Product Design and Development**

Please tell us in detail about the use of lean systems or other new management techniques in the design and development process of new products. In particular, detail recent changes, expenses of these changes, and any cost savings (or cost increases) that resulted.

Other topics and metrics (beside cost) that we are interested in include:

- Co-design with suppliers/collocation
- Number of engineering changes
- Cycle time.

**HUMAN RESOURCES**

One of the foundations of “lean manufacturing” is the importance of the labor force in ensuring efficient production. Please provide the following information on your labor force and labor practices.

- Number of employees (production, support, and management)
- Training hours/employee/year
- Output/employee
- Number of organizational levels
- Percentage of workers on “teams”
- How are workers expected to contribute “thinking” work as well as “doing” work to production?
- Are workers rewarded for ideas?

Are there any data to support a shift or reduction in costs due to the wider use of IPTs?