2012 MPI Manufacturing Study

Please provide a response to each question based on a single manufacturing plant. If you do not know the answer to a question or if a question does not apply or is unclear, simply leave that answer blank. Study deadline is Oct. 16, 2012.

**PLANT PROFILE**

1. Please indicate if this plant is part of a public or private company: (check one) □ Public □ Private

2. In which state is the plant located? ____________________________

3. What is the nature of manufacturing operations for primary products at this plant? (check one)
   - □ Discrete (measured by numeric quantities)
   - □ Process (measured by weight or volume)
   - □ Both or hybrid

4. What is the primary product that this plant produces (e.g., axles, software)? ____________________________

5. How many years has it been since plant start-up? (check one)
   - □ Less than 5 years
   - □ 5 - 10 years
   - □ 11 - 20 years
   - □ More than 20 years

6. In which of the following industry value chains does this plant primarily participate? (check one)
   - □ Aerospace
   - □ Automotive
   - □ Chemicals
   - □ Construction
   - □ Consumer packaged goods/nondurables
   - □ Consumer product durables
   - □ High tech
   - □ Industrial equipment and machinery
   - □ Pharmaceuticals, biotechnology, medical
   - □ Printing and publishing
   - □ Defense industry
   - □ Other

7. Which criterion below best describes the volume and product mix of your plant's operations? (check one)
   - □ High volume/High mix
   - □ High volume/Low mix
   - □ Low volume/High mix
   - □ Low volume/Low mix

8. What is the approximate annual revenue of the plant's corporate parent? (independently owned facilities should respond for the entire company) $__________________________

9. What is the approximate annual revenue of this plant? (if plant is a cost center, please report as the value of shipments)
   - Past year (2011) $__________________________
   - This year (2012) $__________________________
   - Anticipated next year (2013) $__________________________

10. How much progress has the plant made toward achieving world-class manufacturing status? (check one)
    - □ No progress
    - □ Some progress
    - □ Significant progress
    - □ Fully achieved

**HUMAN RESOURCES**

11. How important is human-resource management to your plant's success over the next five years? (check one)
    - □ Not important
    - □ Minor importance
    - □ Somewhat important
    - □ Important
    - □ Highly important

12. Approximately how many employees (all staff) are at this plant location?
    - Past year (2011) ____________________________
    - This year (2012) ____________________________
    - Anticipated next year (2013) ____________________________

13. What percentage of plant production workers are represented by a union(s)? (check one)
    - □ 0%
    - □ 1 - 25%
    - □ 26 - 50%
    - □ 51 - 75%
    - □ 76 - 99%
    - □ 100%

14. What is the plant's annual labor turnover rate for the most recent year? (number of voluntary and involuntary separations + typical staffing level) ____________________________ %

15. What percentage of production employees participate in empowered or self-directed work teams? (check one)
    - □ 0%
    - □ 1 - 25%
    - □ 26 - 50%
    - □ 51 - 75%
    - □ 76 - 99%
    - □ 100%

16. What are the average annual hours of formal training received by each plant employee? (check one)
    - □ Less than 8 hours
    - □ 8 - 20 hours
    - □ 21 - 40 hours
    - □ More than 40 hours
17. What percentage of positions have documented skill standards supported by training aligned with those standards? (check one)  
- □ 0%  
- □ 1 – 25%  
- □ 26 – 50%  
- □ 51 – 75%  
- □ 76 – 99%  
- □ 100%

18. What are the approximate wages for production employees? (hourly rate without overtime)  
- Average wage $_________  
- Starting wage $_________  

19. Which of the following human-resource practices/programs are used at this plant? (check all that apply)  
- □ Formal employee training program  
- □ Apprenticeship program  
- □ Recruiting and hiring program  
- □ Teaming/team-building practices  
- □ Leader/supervisor development  
- □ Formal safety/health program  
- □ Paid medical benefits  
- □ Paid vacation days  
- □ Paid sick and/or personal days  
- □ Employee-ownership options  
- □ Profit or revenue-sharing plan  
- □ Annual review and raise program  
- □ Education reimbursements  
- □ No these  
- □ Bonus plan  

20. For the past year, how many: (total number in plant)  
- Job-related injuries and illnesses ___________  
- Job-related injuries and illnesses resulting in lost work days ___________  

OPERATIONS

21. Please indicate which of the following improvement methodologies are followed at the plant: (check all that apply)  
- □ Agile Manufacturing  
- □ Lean Manufacturing  
- □ Theory of Constraints  
- □ Six Sigma  
- □ Total Quality Management  
- □ Toyota Production System  
- □ Other methodology(ies)  
- □ No methodology  

22. Please describe the depth and breadth of adoption of your chosen methodology(ies)? (check one)  
- □ None  
- □ Minimal  
- □ Moderate  
- □ Extensive  
- □ Complete  

23. How important is process improvement to your plant’s success over the next five years? (check one)  
- □ Not important  
- □ Minor importance  
- □ Somewhat important  
- □ Important  
- □ Highly important  

24. What percentage of your workforce is fully engaged in your improvement methodology(ies)? _______________ %  

25. Which of these programs and/or practices occur at this plant? (check all that apply)  
- □ Benchmarking  
- □ Continuous-improvement program  
- □ Waste elimination (i.e., seven wastes)  
- □ PDCA problem-solving  
- □ Total productive maintenance  
- □ Open-book management  
- □ Value-stream mapping  
- □ Kaizen events/blitzes  
- □ Quality certifications (e.g. ISO)  
- □ Strategy/policy deployment  
- □ None of these

26. Please estimate the following operation/production measures for your plant:

<table>
<thead>
<tr>
<th>Measures</th>
<th>Current Year</th>
<th>3 Years Ago</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Manufacturing cycle time (start of plant production to completion of primary product)</td>
<td>hrs 49</td>
<td>hrs 174</td>
</tr>
<tr>
<td>b. On-time delivery rate (% of goods delivered on time)</td>
<td>% 53</td>
<td>% 164</td>
</tr>
<tr>
<td>c. Perfect delivery rate (% of goods on time to customer-requested date, perfect quality, and to customer specifications)</td>
<td>% 372</td>
<td>% 373</td>
</tr>
<tr>
<td>d. Finished-product first-pass quality yield (% of product that passes final inspection)</td>
<td>% 46</td>
<td>% 147</td>
</tr>
<tr>
<td>e. Scrap and rework (as % of plant sales)</td>
<td>% 176</td>
<td>% 177</td>
</tr>
<tr>
<td>f. Warranty costs (as % of plant sales)</td>
<td>% 178</td>
<td>% 179</td>
</tr>
</tbody>
</table>

27. How has total production output (unit volume) changed in the past 12 months? (check one)  
- □ Decreased more than 20%  
- □ Decreased 11 - 20%  
- □ Decreased 1 - 10%  
- □ Stayed the same  
- □ Increased 1 - 10%  
- □ Increased 11 - 20%  
- □ Increased more than 20%  

28. What are the plant’s costs as a percentage of costs of goods sold (COGS)? (indicate % for each category)  

<table>
<thead>
<tr>
<th>Measures</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Labor</td>
<td>43</td>
</tr>
<tr>
<td>b. Overhead</td>
<td>42</td>
</tr>
<tr>
<td>c. Material</td>
<td>43</td>
</tr>
<tr>
<td>Total COGS</td>
<td>100%</td>
</tr>
</tbody>
</table>
29. What is the plant’s cost of goods sold as a percent of plant revenue? (annual COGS ÷ annual revenue) ... %

30. What are the approximate sales per employee for the most recent fiscal year? (include all employees, not just direct labor) $ per employee

31. How have sales per employee changed in the past year? (check one)
   - Decreased more than 10%
   - Decreased 6 - 10%
   - Decreased 1 - 5%
   - Stayed the same
   - Increased 1 - 5%
   - Increased 6 - 10%
   - Increased more than 10%

32. How have per-unit manufacturing costs, excluding purchased materials, changed in the last 3 years? (check one)
   - Decreased more than 20%
   - Decreased 11 - 20%
   - Decreased 1 - 10%
   - Stayed the same
   - Increased 1 - 10%
   - Increased 11 - 20%
   - Increased more than 20%

33. Which of the following practices are used to manage inventory? (check all that apply)
   - One-piece flow techniques
   - Pull systems with kanban signals
   - RFID and computerized inventory tracking
   - Vendor-managed or -owned inventories
   - Parts/goods supermarkets
   - Production leveling/Heijunka
   - None of these

34. What are the plant’s inventory turn rates for the following categories of material?
   - Raw material (annual COGS ÷ average value of raw material on hand) turns per year
   - Work-in-process material (annual COGS ÷ average value of WIP on hand) turns per year
   - Finished goods (annual COGS ÷ average value of finished goods on hand) turns per year
   - Total inventory (annual COGS ÷ average value of total inventory on hand) turns per year

35. Approximately what percentage of the plant’s total inventory is obsolete? %

36. Has the total inventory turn rate changed in the last three years? (check one)
   - Decreased more than 20%
   - Decreased 11 - 20%
   - Decreased 1 - 10%
   - Stayed the same
   - Increased 1 - 10%
   - Increased 11 - 20%
   - Increased more than 20%

Supply Chain

37. How important is supply-chain management to your plant’s success over the next five years? (check one)
   - Not important
   - Minor importance
   - Somewhat important
   - Important
   - Highly important

38. Which of the following best describes your relationship with suppliers and customers? (check one for each column)

<table>
<thead>
<tr>
<th>Buy and sell (e.g., cost and quality focus)</th>
<th>Suppliers</th>
<th>Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certification (e.g., broad qualifications established)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooperation (e.g., sharing product ideas, best practices)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partnership (e.g., sharing resources, intellectual property, cost savings)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

39. Which of the following criteria are assessed and documented for material/component suppliers? (check all that apply)
   - Quality/reliability
   - Adherence to specifications
   - Environmental performance
   - Delivery (to schedule)
   - Service/responsiveness
   - Criteria of supplier’s suppliers
   - Productivity
   - Labor practices
   - Ethics
   - Other
   - No criteria

40. How have the following (on a per unit basis) changed in the past 12 months? (check one in each row)

<table>
<thead>
<tr>
<th></th>
<th>Decreased more than 10%</th>
<th>Decreased 6-10%</th>
<th>Decreased 1-5%</th>
<th>No change</th>
<th>Increased 1-5%</th>
<th>Increased 6-10%</th>
<th>Increased more than 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Price for your products</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Component/material costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Employee wages</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Employee benefits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Logistics/transport costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Utilities/fuel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
41. To what degree are the following activities outsourced? (check one for each activity)

<table>
<thead>
<tr>
<th>Activities</th>
<th>All</th>
<th>Some</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Fabrication</td>
<td>376</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Assembly</td>
<td>377</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Electrical</td>
<td>376</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Design and/or R&amp;D</td>
<td>377</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Maintenance</td>
<td>382</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Information technology</td>
<td>382</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Purchasing</td>
<td>383</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Transportation</td>
<td>383</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Customer service</td>
<td>384</td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. HR management</td>
<td>385</td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. Sales and marketing</td>
<td>386</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

42. Please estimate the following customer and supplier measures for your plant:

<table>
<thead>
<tr>
<th>Measures</th>
<th>Current Year</th>
<th>3 Years Ago</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Customer reject rates (parts per million)</td>
<td>ppm 369</td>
<td>ppm 370</td>
</tr>
<tr>
<td>b. Customer retention rate (% customers retained from previous year)</td>
<td>% 373</td>
<td>% 374</td>
</tr>
<tr>
<td>c. Overseas sales (as % of total dollar volume)</td>
<td>% 376</td>
<td>% 377</td>
</tr>
<tr>
<td>d. Imported material/components (%) of dollar volume purchased outside home country</td>
<td>% 378</td>
<td>% 379</td>
</tr>
<tr>
<td>e. Imported material/components from China (%) of dollar volume from China</td>
<td>% 380</td>
<td>% 381</td>
</tr>
</tbody>
</table>

43. Which of the following supply-chain programs and/or practices are in place? (check all that apply)

- Certification of major suppliers
- Collaborative design with suppliers
- Collaborative design with customers
- Supplier-management program
- Customer-satisfaction surveys
- Access to customer forecasts
- Sharing forecasts with suppliers
- Kitting/preassembly for customers
- None of these

44. Please indicate how the following have changed in the previous 12 months:

- Insourcing (production work brought back to plant from outside suppliers as % of total volume) ........................................... % 561
- Outsourcing (production work moved to external suppliers as % of total production volume) ........................................... % 562

**CAPACITY / EQUIPMENT / IT**

45. Please estimate the following capacity/equipment measures for your plant:

<table>
<thead>
<tr>
<th>Measures</th>
<th>Current Year</th>
<th>3 Years Ago</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Production volume (as % of designed plant capacity)</td>
<td>% 78</td>
<td>% 180</td>
</tr>
<tr>
<td>b. Machine availability (as % of scheduled uptime)</td>
<td>% 76</td>
<td>% 181</td>
</tr>
<tr>
<td>c. Overall equipment effectiveness (% machine availability x % quality yield x % of optimal rate that equipment operates)</td>
<td>% 80</td>
<td>% 182</td>
</tr>
<tr>
<td>d. Percentage of unplanned maintenance as a percentage of total maintenance (% based on annual maintenance expenses)</td>
<td>% 81</td>
<td>% 183</td>
</tr>
<tr>
<td>e. Return on invested capital (net operating profit after taxes + by capital invested)</td>
<td>% 82</td>
<td>% 184</td>
</tr>
</tbody>
</table>

46. Please rate your plant’s capability to monitor and measure the following: (check one in each row)

<table>
<thead>
<tr>
<th>Measures</th>
<th>1= No capability</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5= Real-time capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process-specific quality</td>
<td>563</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process-specific productivity (i.e., value vs. waste)</td>
<td>564</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process-specific pace or speed</td>
<td>565</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process-specific safety</td>
<td>566</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process-specific sustainability performance</td>
<td>567</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location-specific inventory levels</td>
<td>568</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual equipment or machine performance</td>
<td>569</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-plant material-handling performance</td>
<td>570</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External logistics/distribution performance</td>
<td>571</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplier performance</td>
<td>572</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
47. For which functions are effective information technology (IT) applications and/or systems currently in place? (check all that apply)

☐ Enterprise management  ☐ Planning/scheduling  ☐ Design/development  ☐ Procurement/purchasing
☐ Production/operations  ☐ Logistics/distribution  ☐ Human resources  ☐ Accounting/finance
☐ Supply-chain management  ☐ Asset management  ☐ Customer service/support  ☐ None of these

48. For which functions are applications and/or systems likely to be purchased in the next 12 months? (check all that apply)

☐ Enterprise management  ☐ Planning/scheduling  ☐ Design/development  ☐ Procurement/purchasing
☐ Production/operations  ☐ Logistics/distribution  ☐ Human resources  ☐ Accounting/finance
☐ Supply-chain management  ☐ Asset management  ☐ Customer service/support  ☐ None of these

49. Approximately what percentage of the plant’s greenhouse gas emissions (CO2, methane, etc.) have been reduced in the past year? Approximately what percentage is likely to be purchased in the next 12 months? (check all that apply)

☐ Major decrease  ☐ Some decrease  ☐ No change  ☐ Some increase  ☐ Major increase  ☐ Not applicable

50. What are the following investments/expenses as a percentage of plant sales for the current year, and how is that percentage likely to change next year?

<table>
<thead>
<tr>
<th>Measures</th>
<th>Current %</th>
<th>Increase</th>
<th>Same</th>
<th>Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital-equipment spending</td>
<td>% 159</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Information technology spending</td>
<td>% 160</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Process improvement initiatives</td>
<td>% 390</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Employee costs (all wages, benefits, etc.)</td>
<td>% 390</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Utilities/energy</td>
<td>% 390</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Material and components</td>
<td>% 390</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

51. How did the following affect your company’s profitability in the most recent year? (check one in each row)

<table>
<thead>
<tr>
<th>Measures</th>
<th>Major increase</th>
<th>Some increase</th>
<th>No change</th>
<th>Some decrease</th>
<th>Major decrease</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of improvement methodology(s)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Application of new capital equipment</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Implementation of new IT</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Development of new products/services</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Investments in the workforce</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

52. How important is green/sustainability to your plant’s success over the next five years? (check one)

☐ Not important  ☐ Minor importance  ☐ Somewhat important  ☐ Important  ☐ Highly important

53. Which of these Green programs and/or practices occur at this plant? (check all that apply)

☐ Energy management  ☐ Formal Green corporate program  ☐ Recycling/reuse programs  ☐ Use of renewable energies  ☐ Carbon footprinting  ☐ None of these

54. Please estimate the following green/sustainability measures for your plant:

<table>
<thead>
<tr>
<th>Measures</th>
<th>Current Year</th>
<th>3 Years Ago</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green products (% of plant products that are recyclable/reusable)</td>
<td>% 387</td>
<td>% 385</td>
</tr>
<tr>
<td>Carbon footprints (% of plant products with documented carbon footprint)</td>
<td>% 440</td>
<td>% 440</td>
</tr>
<tr>
<td>Green components and materials (% of purchased components or materials that are recycled/regrind/etc.)</td>
<td>% 447</td>
<td>% 449</td>
</tr>
</tbody>
</table>

55. By approximately what percentage has energy per unit of product output been reduced in the past year? (indicate an increase in energy with + symbol) ......................................................... % 450

56. By approximately what percentage have the plant’s greenhouse gas emissions (CO2, methane, etc.) been reduced in the past year? (indicate an increase in emissions with + symbol) ............. % 451

Thank you for completing the MPI Manufacturing Study

To receive your free Executive Summary of this year’s study findings and free online access to customizable benchmarks from four years’ of the study data, go to www.MPIBenchmarks.com and provide the necessary contact information.

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