



“A Fully Integrated, Total Automated Solution for Wafer Fabrication”

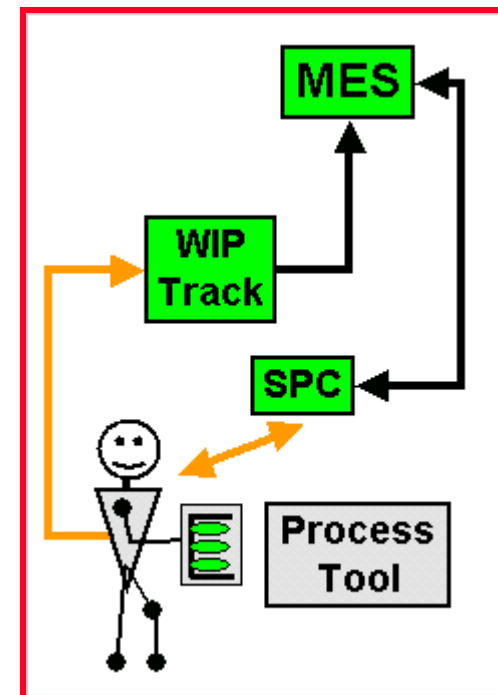
Presented at AEC/APC XVII Sep-2005

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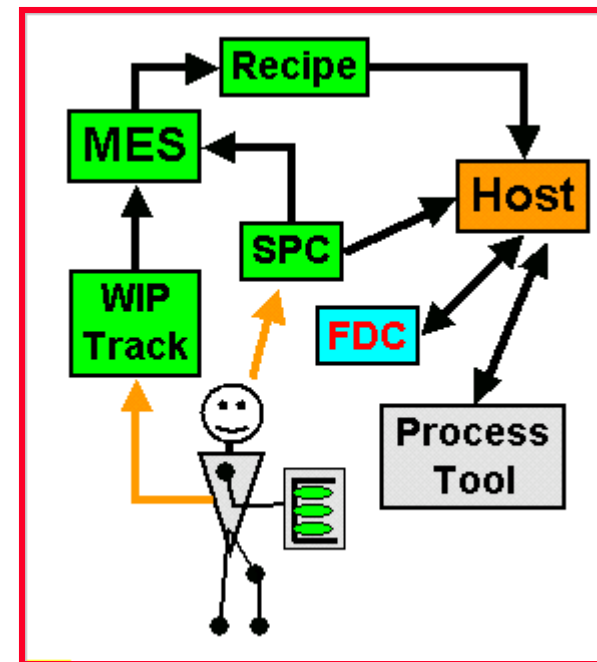
FAB Manufacturing - Late 1980's

- ❑ Operator Placed Lot
- ❑ Operator Checked SPC Chart
- ❑ Operator Selected Recipe
- ❑ Operator Tracked Lot 'in' to MES
- ❑ Operator Pressed 'Start'
- ❑ Lot processed
- ❑ Operator Updated SPC Chart
- ❑ Operator Tracked lot 'out' of MES



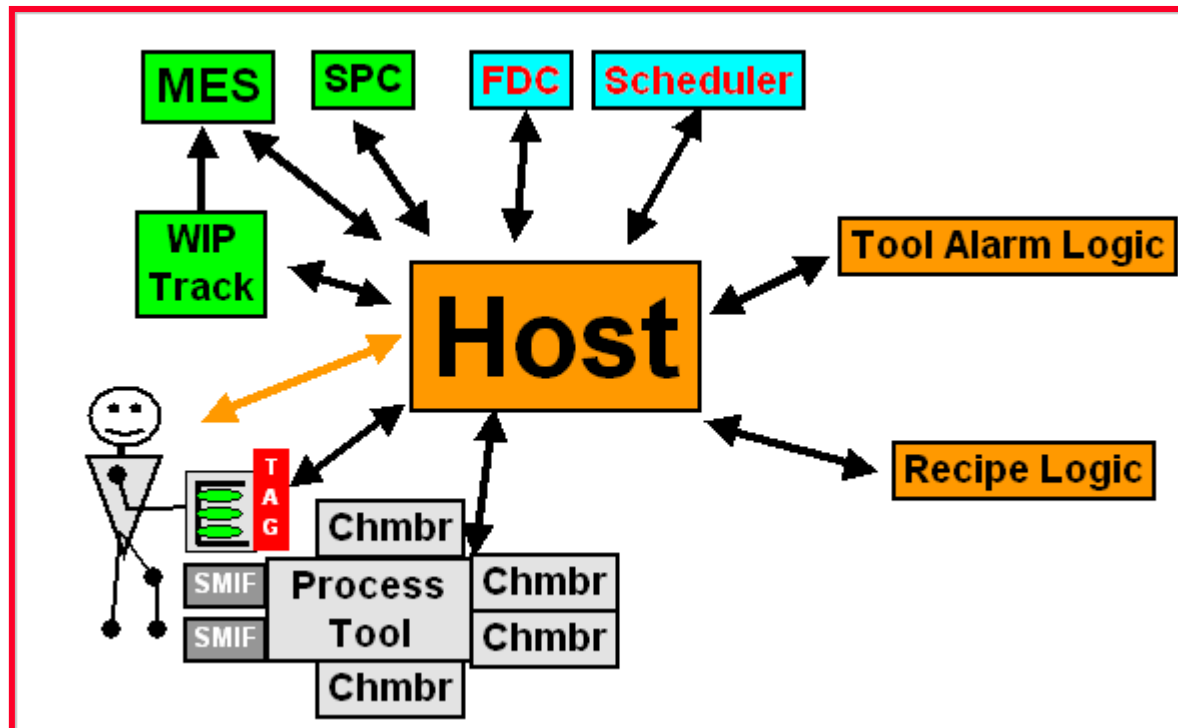
Automation Control - Mid 1990's

- ❑ Operator Placed Lot
- ❑ Host Checked SPC
- ❑ Host Selected Recipe
- ❑ Operator Tracked Lot 'in' to MES
- ❑ Operator Pressed 'Start'
- ❑ Lot processed w/FDC Control
- ❑ Operator Updated SPC Chart
- ❑ Operator Tracked lot 'out' of MES



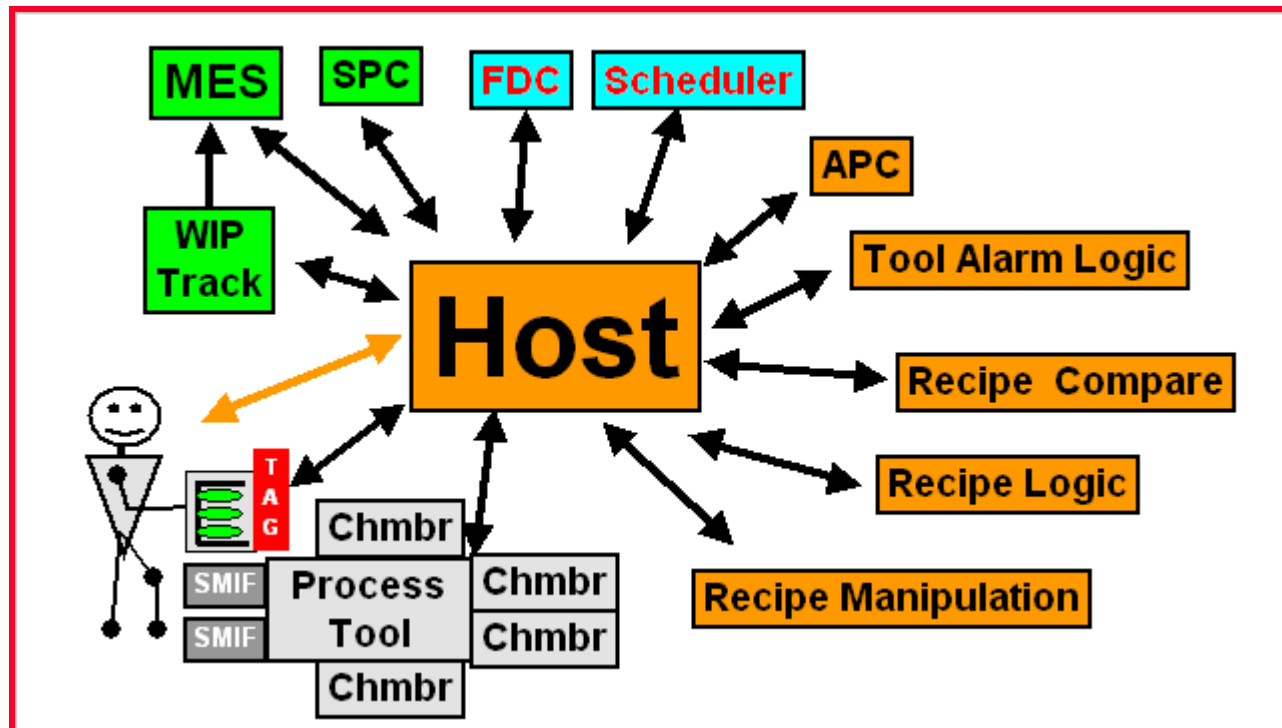
Automation Control - Early 2000's

- ❑ Host Read Electronic I.D Tag and Operator Badge Scan
- ❑ 'Scheduler' Introduced
- ❑ Alarm Control Logic Introduced
- ❑ Recipe Control Logic Introduced



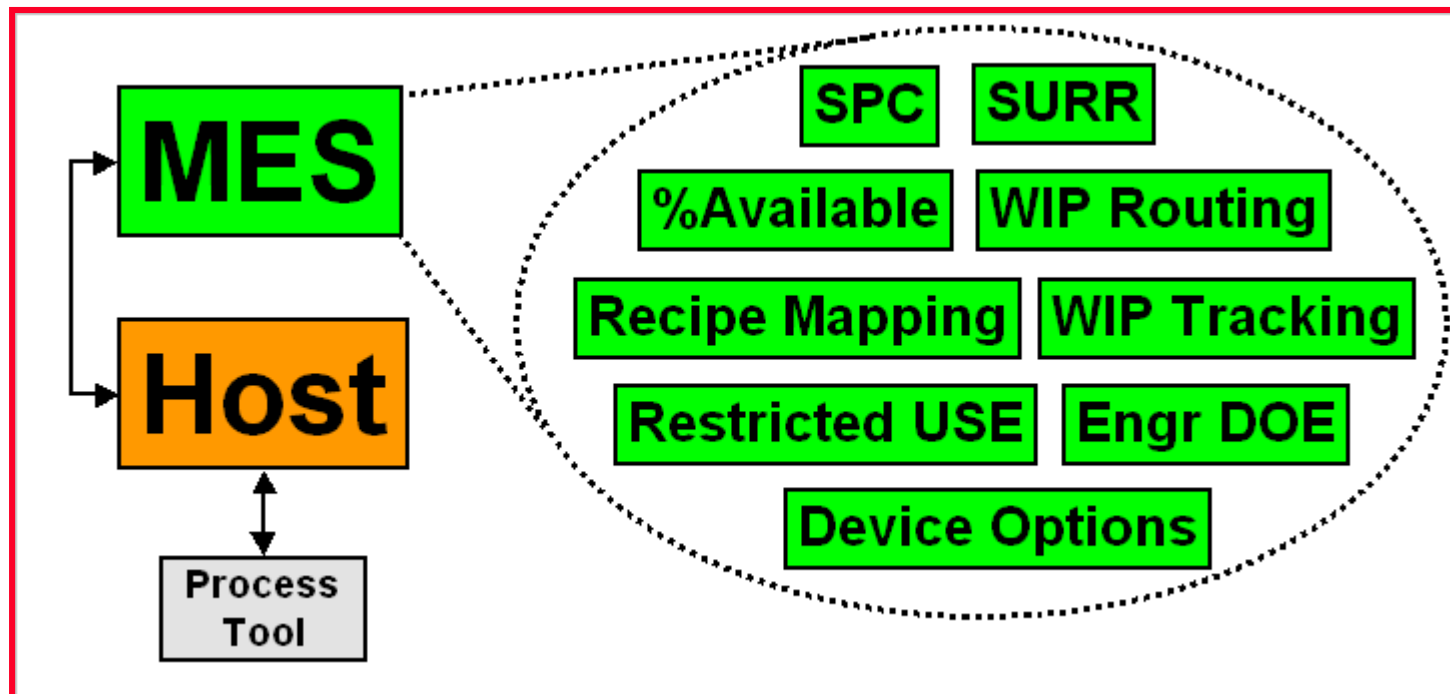
Automation Control - Today

- ❑ Operator Interacts Exclusively with Host
- ❑ If Host or MES Down Then Process Tool Down
- ❑ Added APC and Recipe Parameter Manipulation
- ❑ Added Recipe Compare



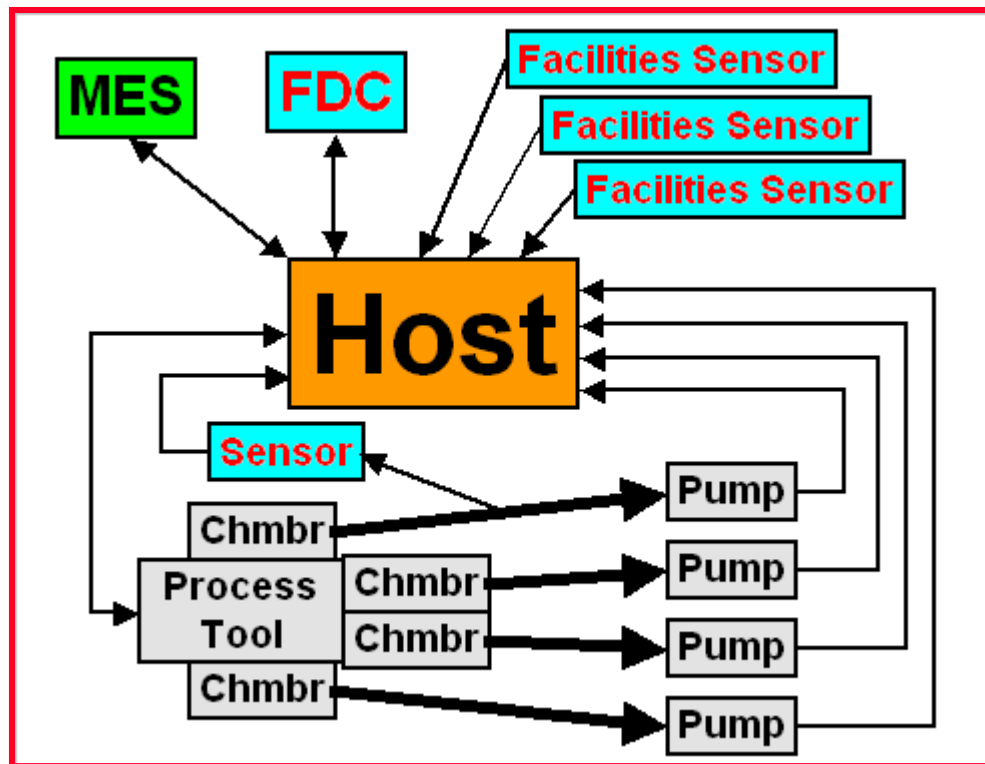
Manufacturing Execution System

- ❑ Standard MES H/W & Data Base
- ❑ Typical Applications Leveraged
- ❑ Several Internally Developed Applications Added
- ❑ Host Reads/Writes Data at Runtime via Proprietary .dll



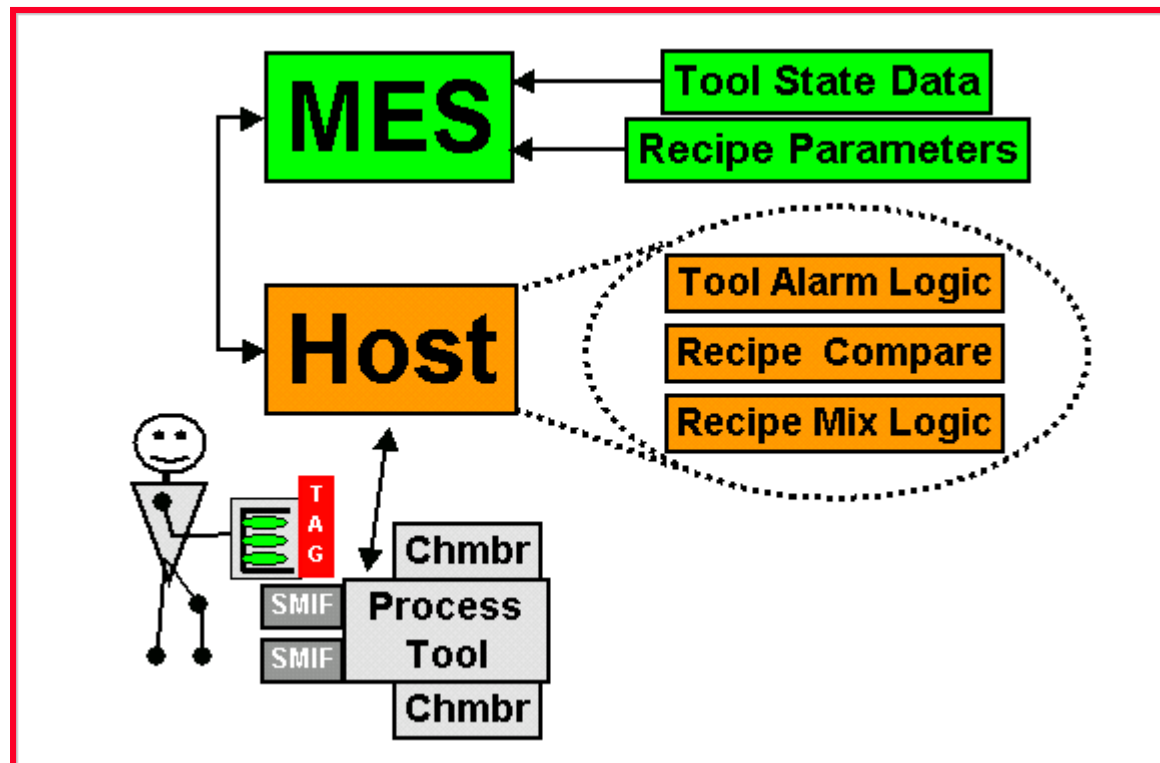
Fault Detection & Classification

- ❑ Critical Support Equipment Connected
- ❑ Commercially Obtained FDC S/W Package
- ❑ Commercially Obtained Specialty Sensors
- ❑ Fully Integrated into Host:MES Operations



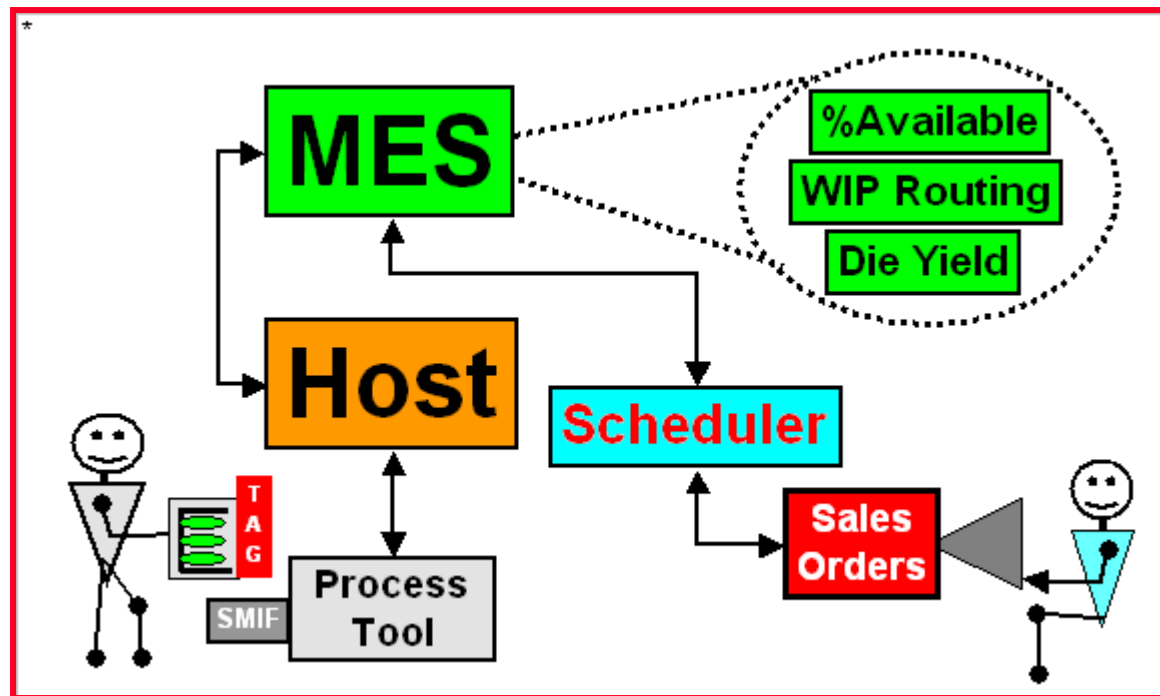
Specialty Applications

- ❑ Configurable Alarms: Ignore/Stop/Prevent, Ignore/Down in MES
- ❑ Recipe Parameters Compared to Known Values at Runtime
- ❑ Recipe Mix Logic Manages Process Mix and Chamber States



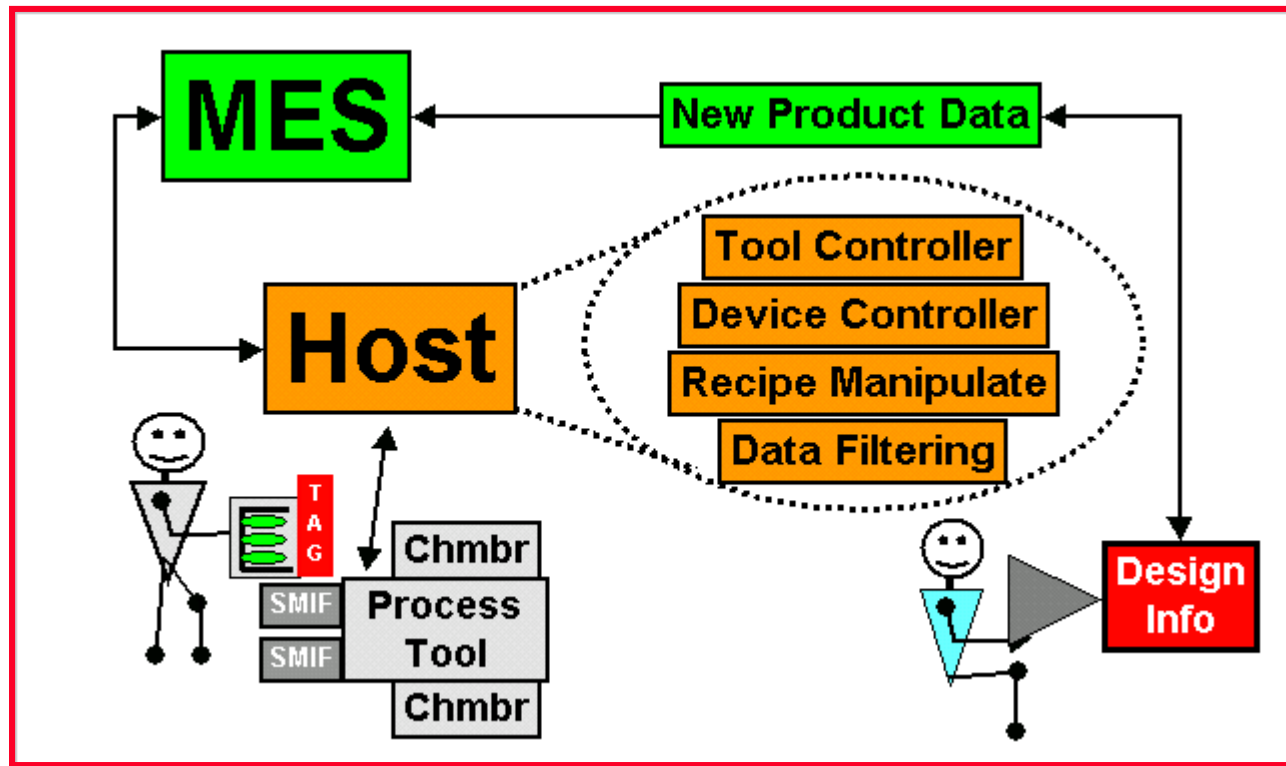
Scheduler

- ❑ Commercially Purchased Application
- ❑ Manages Customer Orders and Production Line Balance
- ❑ Sorts WIP into 'Die Demand' Priority at Run Time



Advance Process Control

- ❑ Host Retrieves Controller Data sets from MES at Runtime
- ❑ Host Applies Data Filtering & Calculates Recipe Set points
- ❑ Host Selects Recipe and Updates Parameters
- ❑ 'New Product' Data Entered directly into MES



Conclusions

- ❑ **The Host Evolved from Non-Existent to Operations' Center Point**
 - + **FAB's Don't Operate Without Host**
- ❑ **Integrated Several Sophisticated Applications**
 - + **Both Off-the-Shelf and Internally Developed**
- ❑ **Significantly Reduced Human Error by Automating & Documenting:**
 - + **Common Operator Tasks**
 - + **Common Engineering Tasks**
- ❑ **Enabled Cost Reductions:**
 - + **Through Human Error Elimination**
 - + **Tool, Support Equipment and Facility Monitoring**
 - + **Demand Scheduling**
 - + **Active Tool and Device Control & Compensation**
- ❑ **Will Continue to Enable Cost Competitiveness:**
 - + **By Adding More Applications and Sensors When Available**