LPMEOH™
Demonstration
Plant Availability

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High Reliability Starts in Design

- Team approach, cooperation between APCI/Eastman Chemical Corporation/DOE
- Recognition of needed Reliability given Eastman current operations record
- Operations Involvement in the Design Process
- Deliberate use of Proven Components
- Minimized Usage of Rotating Equipment
- Cost Effective Redundancy
- Rigorous Owners Engineer Review
- Management of New Technology
LPMEOH™ Demonstration Plant PFD

- Fresh Feed
- Recycle Syngas
- Methanol Separator
- Oil Separator
- Cyclone
- Guard Bed
- N₂
- LPMEOH Reactor
- Steam Drum
- Catalyst Reduction Vessel
- Refined Methanol
- Crude Methanol
- Boiler Feed Water
High Reliability Focus Continues throughout Construction and Start-Up

- Vendor Selection – high on experience
- 15 month Construction Schedule
- 4 Months post-construction commissioning
- Remote and On-Site Supervision
LPMEOH™ Process Availability
1998 - 2000

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Not Required</td>
<td>5.6%</td>
</tr>
<tr>
<td>Turnarounds</td>
<td>2.7%</td>
</tr>
<tr>
<td>Unplanned Outages</td>
<td>1.1%</td>
</tr>
<tr>
<td>On-Stream</td>
<td>90.6%</td>
</tr>
</tbody>
</table>

Availability = 98.8%
# LPMEOH™ Facility Performance

## Unplanned Outages Summary

(Hours of Downtime by Cause)

<table>
<thead>
<tr>
<th>Operating Year</th>
<th>1997</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>324.7</td>
<td>26.4</td>
<td>19.6</td>
<td>240.6</td>
<td>4.7</td>
</tr>
<tr>
<td><strong>Catalyst</strong></td>
<td>149.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Electrical</strong></td>
<td>20.7</td>
<td>5.0</td>
<td>19.6</td>
<td>42.3</td>
<td>0.0</td>
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<tr>
<td><strong>Instrum.</strong></td>
<td>4.0</td>
<td>2.0</td>
<td>0.0</td>
<td>0.0</td>
<td>4.7</td>
</tr>
<tr>
<td><strong>Mech.</strong></td>
<td>150.7</td>
<td>19.4</td>
<td>0.0</td>
<td>198.3</td>
<td>0.0</td>
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</tbody>
</table>
Project Management Continues Focus

- Eastman Chemical Operations Department Builds upon its own strong record
  - Little APCI involvement Day to Day
  - Syngas delivery continues at very high reliability
- DOE continues to be supportive of reliability enhancements
- Basic research into reactor and process dynamics continues
In Conclusion

- LPMEOH™ Facility Continues to Demonstrate Superior Reliability
- Reliability is a Team Responsibility
  - Design Philosophy
  - Operations Input
  - Licensor Review Protocol
  - Technology/Procurement Decisions
- Reliability enhanced by Continuous Operations Improvement
- Operating Lessons now being incorporated into Future Designs.
On Behalf of the Team, Thank You!