

Sloan Foundation Site Visit



*Center for Paper Business and
Industry Studies -- CPBIS*
Atlanta, Georgia – April 30, 2003

Agenda

- Welcome & Introductions – *Tom McDonough*
- Holistic CPBIS View – *Jim McNutt*
- Research Initiatives – *Pat McCarthy*
 - ✓ *Research Initiatives Overview*
 - ✓ *Selected Projects Discussion*
- Lunch With Industry Representatives
- Reconvene Research Projects Discussion
- Education Initiatives – *Vinod Singhal*
- Future Directions Discussion -- *Jim McNutt*
- Concluding Comments – *Gail Pesyna*

Introductions

- Sloan Foundation -- *Gail Pesyna*
- CPBIS
 - ✓ *Director* -- Tom McDonough
 - ✓ *Executive Director* -- Jim McNutt
 - ✓ *Associate Director, Research* -- Pat McCarthy
 - ✓ *Associate Director, Education* -- Vinod Singhal
- GT and IPST
 - ✓ *President, IPST & CPBIS, EB* -- Jim Ferris
 - ✓ *Vice Provost for Research, Dean of Graduate Studies, and CPBIS, EB* – Charlie Liotta
 - ✓ *Dean Ivan Allen College* -- Sue Rosser
 - ✓ *Chair, Chem. Eng. & Acting Director, IPST* -- Ron Rousseau
 - ✓ **Numerous CPBIS Staff, Research Faculty & Grad Students**

Introductions

■ Industry Representatives

- ✓ *CPBIS EB, Chair & Weyerhaeuser* – George Weyerhaeuser
- ✓ *PACE* – Keith Romig
- ✓ *Bowater* – Bob Moran
- ✓ *Georgia Pacific* – Ben Thorp
- ✓ *MeadWestvaco* – Dave McIntyre
- ✓ *PIMA* – Diane Murdock
- ✓ *IPST BDE, NCSU & Temple-Inland* – David Ashcraft

Center for Paper Business and Industry Studies

– A Holistic View of the CPBIS –

A Holistic View of The CPBIS

- The Pathway From 1999 – 2003 – An Overview
 - ✓ *Key CPBIS Foundations*
 - ✓ *Major CPBIS Milestones*
 - ✓ “The Community”
- Major Issues To Be Addressed
 - ✓ *Internally*
 - ✓ *Externally*
- Path Forward -- *Commentary*

Key CPBIS Foundations

- **CPBIS Foundations – Four-way Partnership**
 - ✓ **The Paper Industry**
 - ✓ **The Sloan Foundation**
 - ✓ **Institute of Paper Science & Technology**
 - ✓ **Georgia Institute of Technology**
- **Other Critical Components/Assets**
 - ✓ **GT and IPST Faculty and Grad Students**
 - ✓ **IPST Business Development Executives**
 - ✓ **CPBIS Industry Executive Board, Advisory Board and Operations Coordinating Council**

Key CPBIS Foundations

- ***CPBIS Established Vision***
 - ✓ ***“CPBIS is recognized as the global center of knowledge generation and retention in Paper Industry Studies.”***
- ***CPBIS Established Missions***
 - ✓ ***“Create an Academic Community that understands the Paper Industry.”***
 - ***Research*** – “Study the Industry by direct observation, providing research results that are of great scholarly interest and of high practical value to the Industry.”
 - ***Academic Affairs*** – “Produce skilled, Paper Industry-oriented Ph.D. and M.S. graduates in a variety of Industry-based disciplines.”
 - ***Continuing Education*** -- “Establish diverse, in-depth continuing education program tailored to meet explicitly defined needs of the Paper Industry for enhanced management success of the Industry.”

Key CPBIS Foundations

- ***The CPBIS and Each Operating Component -- Research & Education -- Based on Five Inclusive Theme Areas As The CPBIS Strategic Platform***
 - ✓ **Globalization – International Forces**
 - ✓ **Enterprise Effectiveness – Factors Affecting Company Performance**
 - ✓ **Workplace Transformation – Organizational Changes for Productivity**
 - ✓ **Commercialization – Harnessing Science**
 - ✓ **Community – Relationships With Constituencies**

Major CPBIS Milestones

- Late 1999
 - ✓ *Sloan Invitation/GT & IPST Response*
- During 2000
 - ✓ *Early in Year – Industry Surveys on CPIBS Path*
 - ✓ *First Half of Year – Sloan Proposal Collaboration*
 - ✓ *August – Sloan Proposal Submission*
 - ✓ *September – Industry Commitments -- \$1+mm*
 - ✓ *October – Sloan Proposal Approval – \$2.1mm*
 - ✓ *November – CPBIS Organization Work/Kick-off*
 - ✓ *December – First CPBIS RFP*

Major CPBIS Milestones

■ During 2001

- ✓ *By Mid-Year – Reviewed, Selected & Initiated first Seven CPBIS Research Projects + Liaison Panels*
- ✓ *May – Formally Dedicated CPBIS*
- ✓ *Established/Initiated During the Year*
 - Executive Board, Industry Advisory Board and Operations Coordinating Council + Ops Metrics
 - Operating Committees for Research, Academic Affairs & Continuing Education
 - CPBIS Web Site and Communications Program
 - Mill Visit Program for Faculty & Graduate Students
 - Seminar Series, Newsletter, CPBIS Intern Program
 - Established Protocols Between GT and IPST

Major CPBIS Milestones

■ During 2002

- ✓ *Endorsed/Established Webcast Strategy*
- ✓ *Established Rethink & Discovery Series*
 - *Webcast First Event – March – Paper Summit*
 - *PIMA Annual Conference & NCSU P&P Foundation*
- ✓ *Approved/Implemented 2 New Research Projects*
- ✓ *Designed/Delivered First GT Graduate Courses*
- ✓ *Established Distinguished Lecture Series*
- ✓ *Began Design of CE Courses*
- ✓ *Partnered With PIMA For Web-based CE Courses*

Major CPBIS Milestones

■ During 2003

- ✓ *Delivered with PIMA First Ever Industry Management Web-based CE Course Programs*
- ✓ *Co-Sponsored First International Finance & Business Forum Conference*
- ✓ *Approved/Implemented 2 New Research Projects*
- ✓ *Advanced “Participation Agreements” Process*
- ✓ *Initiated Work on CPBIS Roleover into GT with IPST/GT Integration + Next Three Years’ Program*
- ✓ *Established CPBIS Fellows Program*
- ✓ *Initiated Work -- Sloan Renewal Process/Proposal*

“The Community”

- Key to Center’s Success = Collective Efforts to Build Comprehensive *Academic & Intellectual Community* That:
 - ✓ Pose Theoretical & Practical Questions *About The Industry.*
 - ✓ Facilitates Shared Learning *About The Industry.*
 - ✓ Encourages Participants To Involve Themselves In A *Variety Of Academic Exchanges Across Topics & Across Time.*
- The CPBIS Will Help Create a *Paper Industry Intellectual Community* by Engaging in Actions That Include:
 - ✓ Rigorous and challenging *research program*
 - ✓ Innovative/Informative *Graduate And CE Course Offerings which Incorporate Research Results*
 - ✓ Periodic Focused *Research Workshops*
 - ✓ Regular Project *Reports/Audit Program*
 - ✓ Colloquia With Distinguished *Guest Lecturers*
 - ✓ Industry Executive *Panels & Conference Programs*
 - ✓ Familiarization Faculty/Graduate Students *With Paper Industry*
 - ✓ Channeling Graduate Student Efforts *Toward Industry Issues*

“The Community”

- Major CPBIS Effort To Create & Engage A Very Broad Paper Industry Community Has Evolved
 - ✓ *Across Community Arena*
 - Funding -- In-Kind Support – Data Sourcing . . .
 - Communications -- Seminars, CE Courses . . .
 - Issue Raising & Related Dialog . . .
 - ✓ *Which Has Impacted Industry Connectivity – Catalyst To Enhance Engagement Across Many Industry Organizations – Public and Private*
 - ✓ *CPBIS “Brand” & Stature Has Emerged*

“The Community”

Industry Financial Commitments To-Date

- Abitibi-Consolidated
- Accenture
- Albany International
- ArborGen
- AstenJohnson
- Australian Paper
- BE&K
- Bowater
- Buckman Labs
- ForestExpress
- Forestweb
- Georgia-Pacific
- Gulf States
- Imerys
- Inland
- Jacobs Engineering
- Kruger
- MeadWestvaco
- P. H. Glatfelter
- Potlatch
- Sappi-North America
- StoraEnso
- Tembec
- Tradition Financial Services
- UPM–Kymmene N. Am.
- Weyerhaeuser

“The Community”

In-Kind Support & Alliances To-Date

- AF&PA
- Ecole Polytechnique
- Forestweb
- FPAC
- NC State Univ.
- Oregon State Univ.
- PACE
- PAPRICAN
- PAPTAC
- PIMA
- Sloan Trucking Ctr.
- TAPPI
- Univ. of Florida
- Univ. of Georgia
- Univ. of Michigan
- Watermark

Major Issues To Be Addressed

■ Internally

- ✓ *Adjusting to the IPST/GT Integration*
- ✓ *Enhancing Awareness/Integration Across GT*
- ✓ *Focusing On Advancing Complex Research Program & Extracting Results*
- ✓ *Balancing Education/Research/Mgt. Efforts*

■ Externally

- ✓ *Industry Connectivity – Programs & Data*
- ✓ *Sustainable Long Term Funding Support*
- ✓ *Sustaining/Expanding Center's Role/Influence*

Path Forward – *A Commentary*

- **Enthusiastically & Aggressively *Continue To Establish* Research, Graduate Education & CE Programs That Benefit *Both The Industry And The Academic Community***
- **In So Doing, Capitalize On This Opportunity To Focus A Powerful Body Of Educational Resources *On Issues Of Interest To & About The Pulp And Paper Industry***

“We Will Seek to Dent the Universe!”

Center for Paper Business and Industry Studies

– *Research Initiatives* –

Research Initiatives Overview

- **Observation-Based Research**
- **Competitive Funding Initiatives**
- **Non-competitive Initiatives**
- **Summary**

Observation-Based Research

- **Researchers - primary data collectors**
 - ✓ *Surveys*
 - ✓ *Focus groups*
 - ✓ *Ethnographic studies*

- **Engages Industry Directly**
 - ✓ **Access**

Competitive Funding

Steps in the Funding Process

- RFP
- External Reviewers
 - ✓ *Academic*
 - ✓ *Industry*
- Research Operations Committee
 - ✓ *CPBIS Director*
 - ✓ *GT/IPST Representation (3)*
 - ✓ *Industry Representation (3)*
- Research Awards
- Industry Liaison Panel

Competitive Funding

CPBIS Research Proposal Criteria

Academic Merit and/or Cogency -- meets a high level of academic standards and generates new knowledge and perspectives

Likely Benefit or Relevance to the Industry -- meets a defined Industry need in measurable ways

Practicality of Achieving Stated Goals -- ease of data/information availability and the likelihood of achieving stated goals

Likely Sense of Urgency -- importance in terms of timeliness of the research to either knowledge creation and/or industry needs

Reliance on Direct Observational Methods -- observation based Methodology will apply

Contribution to Graduate Education -- provides for graduate student education and training through involvement in research

Interdisciplinary And/or Inter-institutional Character -- multi-disciplinary and/or crosses departmental, college or institutional boundaries

Competitive Funding

11 Projects Funded (\$1.52 million)

■ 31 Faculty

✓ *By Affiliation*

➤ Georgia Tech -- 24 IPST – 4 Ecole Polytechnique, UGA, UFL

✓ *By Discipline*

➤ Econ -- 5	Management – 9	Public Policy -- 1
Forestry -- 2	Manufacturing -- 2	Paper Science -- 4
Hist, Tech, Society --3	Mech. Engr. -- 2	Ind. Sys. Engr. -- 3

■ 31 Students

✓ *PhD students -- 14*

Master's students -- 17

■ Length of Projects

✓ *1 Year Projects – 3 2 Year Projects – 5 3 Year Projects – 3*

Competitive Funding

CPBIS Funded Research (000)



Competitive Funding

Research Themes

- Globalization – *International Forces* (4.9%)
- Enterprise Effectiveness – Managerial And Operational Improvements (30%)
- Workplace Transformation – *Organizational Change, Labor/Mgmt, Productivity* (9.4%)
- Commercialization – *Harnessing Innovation* (18%)
- Community – *Industry/Community Linkage* (25.7%)

Other Research Initiatives

Non-Competitive Research Funding

- White Paper Initiative
 - ✓ *Technology Gap* (V. Ghosal)
- Student Research Projects
 - ✓ *Globalization Trends in Pulp and Paper* (D. Taylor Jr.)
 - ✓ *Valuing Forest Biotechnology for UFS Producers* (R. Singh)
 - ✓ *Global Supply Chain Modeling Techniques & Key Issues* (E. Lystad)

Cross - Center Activities

- Joint Research with Trucking Industry Program (*Logistics Project*)
- Global Knowledge Networks Proposal
- Cross-Center Conference Participation (*INFORMS, AACSB*)

Research Dissemination

- Annual Research Workshop (2)
- CPBIS Sponsored Activities
 - ✓ *Conferences* (4) *Research Seminars* (19)
- Conference Presentations (10+)

Summary

- **Research Program**
 - ✓ *Robust*
 - ✓ *Diversified*
- **Lessons Learned**
 - ✓ *Infrastructure -- is critical*
 - ✓ *Accessing Industry -- is critical*
 - **Observation-Based Research**
 - **Liaison Panels**
 - **Participation Agreements**
 - ✓ *Community Building*
 - *Is hard*
 - *'Think' CPBIS*

Selected Projects' Overview

Before Lunch

- **Commercialization of Forest Biotechnology**
- **Environment & Economic Performance**
- **Workplace Transformation & Human Resources Practices**

After Lunch

- **Policy Organization & Innovation**
- **Maintenance, Repair & Operating Supplies**

**Commercialization of Forest
Biotechnology: Economic Targets for
Enhanced Global Competitiveness of the
U. S. Pulp and Paper Industry**

PHASE 1

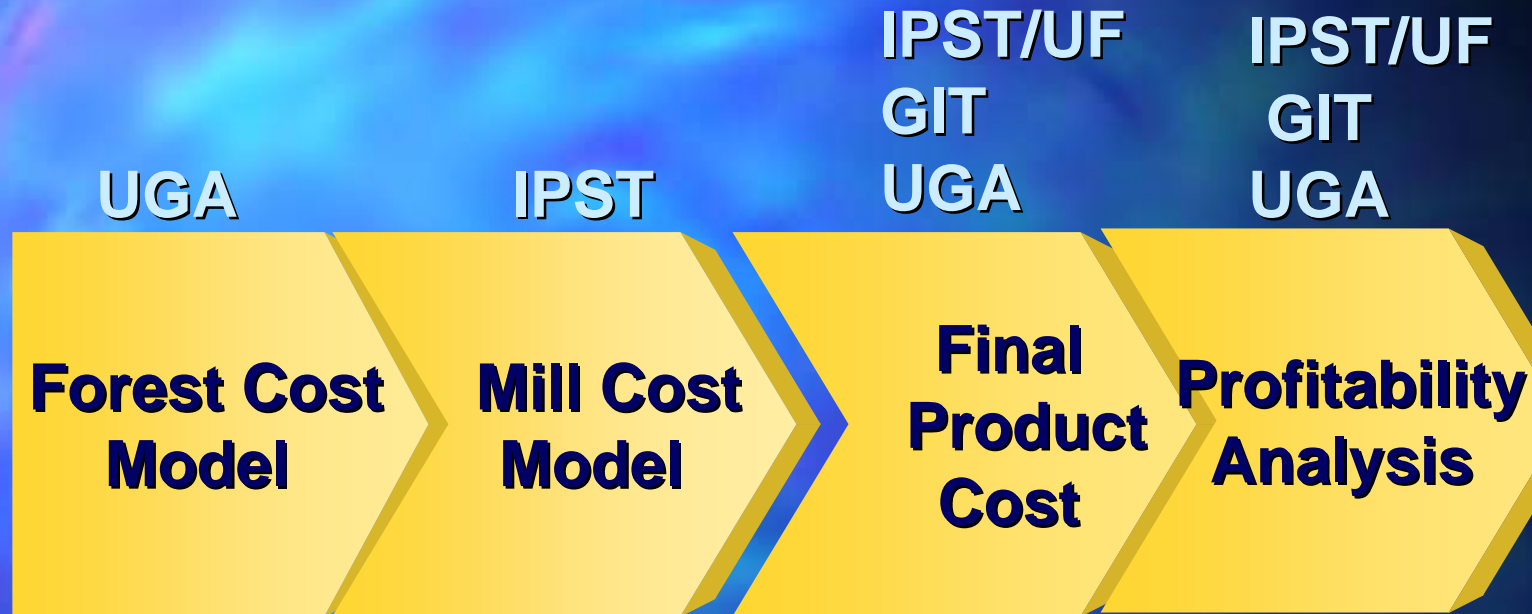
Who Will Own the Forest? – Current Pressures on U.S. Forest Industry

- **Divest land holdings**
 - ✓ *Wall Street Analysts*
 - ✓ *Urban Development*
 - ✓ *Minimize Environmental Impacts*
- **Increasing wood costs**
 - ✓ *Best Management Practices*
 - ✓ *Forest Certification*
 - ✓ *Lands for Conservation*
- **Need more value from a smaller land base**

Economic Assessment of Forest Biotechnology: Phase 1

- What Loblolly Pine Wood/Tree Traits When Altered Can *Dramatically Reduce The Cost* Of Kraft Pulp And Linerboard Production In The U.S.?
- What Is The *Potential & Possible* Cost Of Research Needed To Alter These Wood/Tree Traits By
 - ✓ *Clonal Forestry*
 - ✓ *Breeding*
 - ✓ *Genetic Engineering*
- What *Impact Can Forest Biotechnology Have* On The Structure Of The U.S. Industry?
 - ✓ *Co Evolution Of Raw Materials & Processing Methods*

Overview of Modeling Approach



Trait Variations & Impact on Final Product Quality

IPST, UF

Analysis of Profitability Functions for Optima & Validation of Results

GIT, IPST, UGA, UF

Where Do We Go Next?

- Continue benchmarking and getting *feedback* from industry
- *Expand* cost modeling with more traditional forestry model for comparisons
- Evaluate costs and *ability for genetic improvements*
- Extend to *box production* through IPST MS student
- Write *peer reviewed publications*
- Initiate *phase 2* of project?

Workplace Transformation and Human Resource Practices

***Profs. Chuck Parsons, Steve Vallas, Nate
Bennett***

Students: Raul Necochea, Jon Vaughn

General Background

- Past Industry Studies (e.g. Applebaum et al., Ichniowski et al.)
- Resource-Based view of Strategic Human Resource Management
- Missing Pieces

Our Research Goals

- Better understand the “*bundles*” of practices that make a difference
- Better understand the *role of the union* in both the adoption and implementation of “*high performance*” practices
- Better understand ‘*multi-layers*’ of organization and their effect on adoption and implementation
- Better understand the interpersonal dynamics *of mills* with various HR practice profiles as well as the worker-related outcomes

Methods of “Engagement” & Research

- Initial plans to ‘*build bridges*’ in order to facilitate good survey research
 - ✓ *Successes*
 - ✓ *Setbacks*
- Data collection *awaits legal paperwork and negotiation of participant agreement language*
- Eventual on-site observational studies *can build upon previous ethnographic research work by one of the PI’s.*

CPBIS Fellows Presentation

Lunch Break

*Lunch with Industry
Representatives*

Policy, Organization, and Innovation in American Pulp and Paper since 1914

*Historical Perspectives on
Contemporary Problems*

Staff

- ***August Giebelhaus***, Professor, School of History, Technology, and Society (HTS)
- ***Steven Usselman***, Assoc. Professor, HTS
- ***Hannes Toivanen***, PhD Candidate, HTS
- ***Phil Unger***, PhD Candidate, HTS
- **The Patent Posse: *Four Undergraduate Research Assistants***

Goals

PROVIDE HISTORICAL PERSPECTIVE

- Road Map for Industry
- Historical Analogies

AREAS OF FOCUS

- Competition Policy and Innovation
- Environmental Policy and Innovation

Methodology I

INDUSTRY OVERVIEWS

- Legislative histories
- Aggregate data from government, trade association, and firm sources
- Patent data from USPTO & other sources

Methodology II

CASE STUDIES

- **Corporate Archives**
 - ✓ *Westvaco (Cornell)*
 - ✓ *Hinde and Dauch (Cornell)*
 - ✓ *Weyerhaeuser (Seattle)*
- **Trade Associations**
 - ✓ *IPST Collections (Georgia Tech)*
 - ✓ *Everest Papers (U. of Wisconsin)*
- **Patent Records**
- **Interviews and Ethnography**

Preliminary Results

■ Academic Papers

- ✓ *Business History Conference*
- ✓ *Society for the History of Technology*
- ✓ *History of Science Society*

■ Draft Studies

- ✓ *Toivanen for Fall 2003 PIMA*
- ✓ *Unger at Graduate Forum*

What's Ahead

- Two Monographs
 - ✓ *Dissertations In Progress*
- Conference Presentations
- Reports for Industry

Integrated Environmental and Economic Performance Assessments

***For Strategic Planning and
Policy Analysis in Paper
Manufacturing***

Project Team

Dr. Bert Bras, School of Mechanical Engineering

***Dr. Leon McGinnis, Dr. Chen Zhou, School of
Industrial and Systems Engineering***

Dr. Carol Carmichael, Manuf. Research Center

A Study of the MRO Supply Chain for Paper Mills

***MRO - Maintenance,
Repair and Operations***

Importance

- MRO supplies account for ***\$60-\$80 per ton*** of paper
- A 10% decrease in MRO expenses saves ***\$0.6 - \$0.8M per 100K tons*** of production
- MRO Supply Chain Practices also impact:
 - ✓ *Productivity*
 - ✓ *Paper quality*
 - ✓ *Customer service*

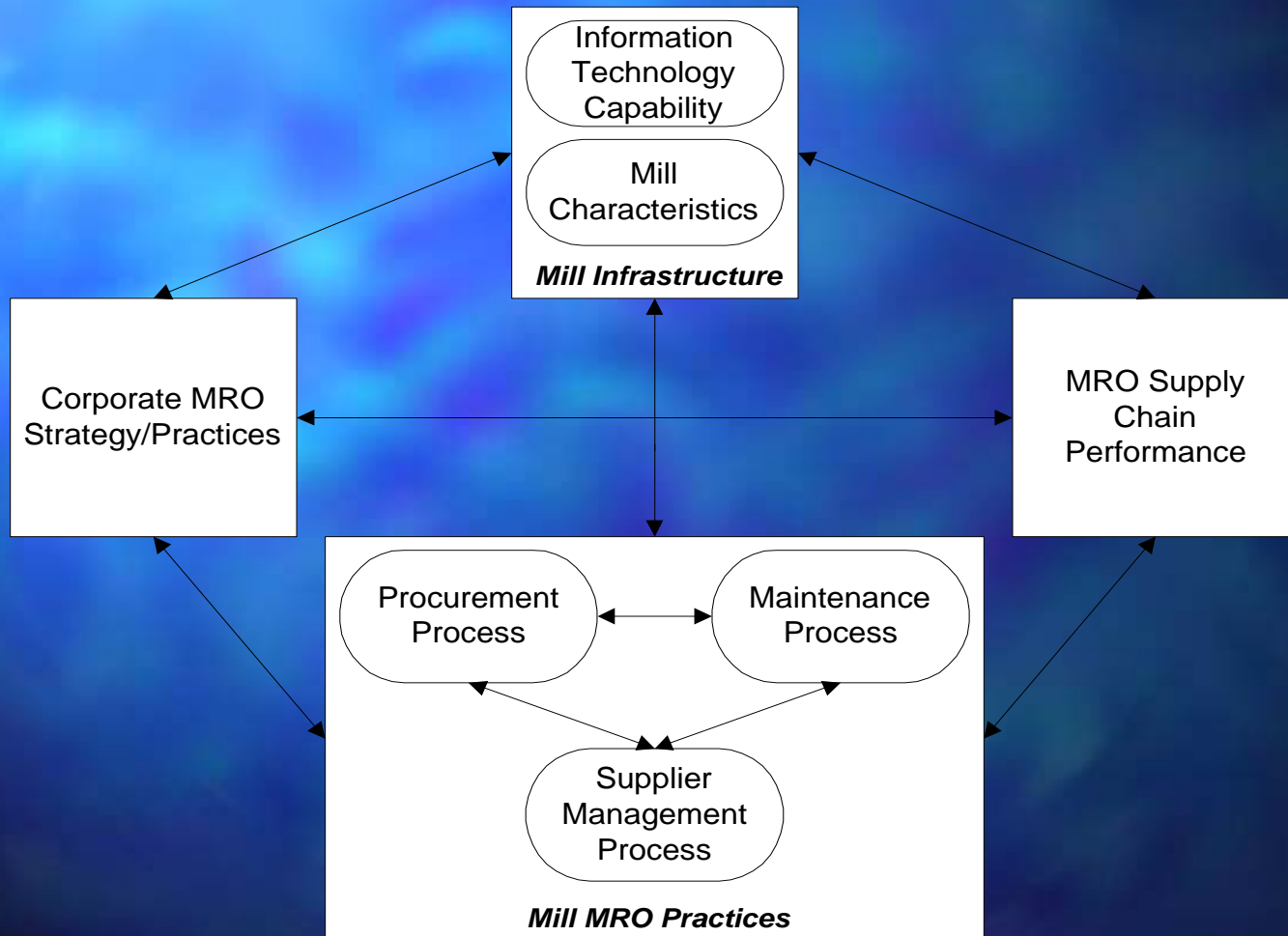
Methodology

- Phase 1 (*Field Study*)
 - ✓ *Reviewed* related literature
 - ✓ *Created structured interview protocols*
 - ✓ *Completed* site visits (*3 paper mills*)
 - ✓ *Established* preliminary insights on *current MRO supply chain practices*
 - ✓ *Developed* a conceptual framework of the *MRO Supply Chain*
 - ✓ *Currently creating* a survey instrument

Methodology

- **Phase 2 (*Survey Data Collection & Analysis*)**
 - ✓ ***Conduct empirical data collection*** from paper mills
 - ✓ ***Collect objective performance data*** from secondary sources
 - ✓ ***Analyze data & test*** statistical significance of ***relationships among practices & performance***
 - ✓ ***Identify MRO supply chain practices that improve MRO supply chain performance***

Conceptual Framework of MRO Supply Chain



Observations

- *Collaboration* with suppliers
- Use of *national contracts* to streamline purchasing while leveraging economies of scale
- Corporate initiatives to *standardize use* of MRO items
- Benefits from *more formal* MRO processes
- Opportunities for use of *more sophisticated* inventory management and forecasting tools

Center for Paper Business and Industry Studies

– *Education Initiatives* –

Overview

- Continuing Education Activities
- Graduate Education Activities
- Future Plans

Continuing education strategy

- Build *Industry Awareness* & Involvement
- Develop & Build *Relationships & Network*
- Develop Ability to Reach a *Broad Audience*
- Use *Diverse Delivery Mechanisms* to Enhance Effectiveness
- Invest in *Distance Learning* Technology
- Design, Develop, *and* Deliver Programs

Key Initiatives

Distinguished Lecture Series

- 6 Speakers Every Year
- *Diversity* in Background, Experience, and Topics
- In-room Audience of *50 to 180*
- Webcast Averages About 45 Locations Globally – Audience Range *50 - 280*

Key Initiatives

Rethink and Discovery Series

- Hosted Every Quarter (3 So Far)
- Targeted Towards *Senior Level* Managers
- *Forum* to Debate and Discuss Business and Technological Related Issues
- In-room Audience of *100 to 420*
- Global Broadcast -- 50 or More Locations
Tune in Via Web – Audience Range *100 –200*

Key Initiatives

International Finance Forum -- With PaperCast

- Managing Stakeholder Aspirations Through Innovation – *2 Day Conference* at IPST
- Targeted Toward *Senior Managers* in the Industry
- *20 Different Speakers* From Academia, Financial Institutions, and Industry
- Discussed Performance, Competitiveness, Risk Management, & Supply Chain Management Issues
- In-room Audience of About *85*
- Informal Feedback Has Been *Very Good*

Key Initiatives

Continuing Education Program on Defining and Achieving a Reliability Culture

- **Five *90 Minutes Webcast Classes* -- Maintenance and Reliability Issues**
- **Targeted *at Mill or Plant* Level Personnel**
- **Delivered *Live* (and Recorded) Via the Web**
- **About *35 Locations and 250* Student Participants in These Webcasts**
- **Average Evaluations Varied Between *3.7 to 4 on a 5* Point Scale Across 14 Questions**

Key Initiatives

Continuing Education Program on Management Development for Enhanced Performance

- 4.5 Day *In-class Program* Offered -- GT Campus
- Targeted at *Senior Mill/plant Level* Personnel
- Addresses How to *Effectively Manage* the Financial, Physical, and Human Assets
- Expect About *12 to 18* Participants

Continuing Education –Future Plans

- Continue to Build & Strengthen *Existing Initiatives*
- Offer *New Webcast CE Programs*
 - ✓ *Problem solving skills*
 - ✓ *Managing organizational safety*
 - ✓ *Developing technical management skills*
- Develop & Offer a *Comprehensive Management Continuing Education Program*
 - ✓ *80 to 100 hour program*
 - ✓ *Targeted toward production and technical people*
 - ✓ *Mixed delivery mechanisms – 70% via the web and rest on campus*
- Working to Develop a Focused Program *on Change Management* for Senior Managers

Graduate Education Initiatives

- Involvement Of Graduate And Doctoral Students In Research Projects (*27 Students*)
- Graduate Courses
 - ✓ *Studies In American Manufacturing: The Paper Industry*
 - ✓ *Process Management In The Paper And Process Industries*
- Graduate Fellows Program
 - ✓ *Up To Three Per Year*
 - ✓ *\$20,000 For One Year To Support A Graduate Or Doctoral Student On Issues Related To The Paper Industry*
 - ✓ *Second Year Renewal Possible*
 - ✓ *Eight Applications Received – Two Awards Granted*
- Internship Program (Placed One Student Each During The Last Two Years – Two This Year To-Date).

Graduate education – Future Plans

- Continue to *Build & Strengthen* Existing Initiatives
- Develop the Internship Programs to Increase the Number of Internships That Are Offered Every Year
- Develop & Offer Graduate Courses on Paper Industry
 - ✓ *Environmental economics in the Paper Industry*
 - ✓ *Paper Industry research seminar series*
- Develop *Certificate Program* to Enable Students With Technical Background to Be Better Prepared to Deal With Business Issues Faced by the Paper Industry
 - ✓ *Two or three required courses*
 - ✓ *Two or three electives that can be taken in DuPree or Ivan Allen college*

Future Directions Discussion

-- OPEN FORUM DISCUSSION --

EDUCATION

RESEARCH

CENTER SUSTAINABILITY

-- Key Issues/Opportunities/Directions --

Concluding Comments

GAIL PESYNA

THE SLOAN FOUNDATION