

Analytical Excellence Program

Analytical Research and Services

Albemarle Corporation - Process Development Center

Larry S. Simeral - - Technical Director

Overview

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- Beginnings
- Analytical Department challenges
- Building on corporate foundation
- Discipline and Innovation Indices
- Measurement details and typical results
- Accomplishments and headwinds

Beginning to Measure

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- What and how to measure?
- What adds value for internal and external customers?
- What measures does the company use?
- What areas need improvement?
- What “sells” the group up the management chain?
- What’s easy to do?

Albemarle AR&S organization

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- Analytical for QC, R&D, corporate problem solving, and customer technical service
- On-site QC 24/7/365: 12 techs and 1 manager
 - 95% of QC work = on-site production
 - Multiple techniques: NMR; ICP; XRF; LC; GPC; GC; KF; titration, etc.
- “Non-QC”: 25 professionals + 4 techs organized on expertise and technique
 - ~75% R&D; ~25% production/problem solving local and corporate
 - Wide product mix (catalyst, fine chemicals, polymer additives) with many batch processes, cleanouts, R&D scale-ups, and R&D samples.

Corporate Foundations Model



- Manufacturing Based

- “Disciplined” Focus

Plan and execute

Meet established targets

Document

Work safely

Incremental change based on quality and cost

Innovation Added

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Discipline

Plan and execute
Meet established targets
Document
Work safely

Innovation

Create the new
Solve problems
Change
Seek frontiers

Scorecard: Keep It Simple



- Make it simple to set up
- Make it easy to maintain
- Use readily available data
- Document and report

Discipline Index Measures



- OSHA Recordable Injuries
- Safety incidents (no injury; first aid; etc.)
- Production or quality incidents attributed to analytical
- Analytical cost center variance
- Deadlines/targets met

Innovation Index Measures

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- New methods developed and reports/documentation
- Improved methods and documentation
- Customer compliments (exceed expectations)
- Awards and recognition
- Training and learning

Discipline Scoring

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| S C O R E | OSHA Recordable | Safety Incident <u>Rate</u> | Customer Complaint <u>Rate</u> | Cost Center Variance <u>Percent</u> <u>of Plan</u> | Ave. Sample turnaround time in days |
|-----------------------|--------------------|--------------------------------|-----------------------------------|--|---|
| 5 | 0.0 | 0.2 | 0.1 | -5.0 | 2 |
| 4 | 0.03 | 0.3 | 0.2 | 0.0 | 2.5 |
| 3 | 0.05 | 0.4 | 0.3 | 5.0 | 3.0 |
| 2 | 0.07 | 0.45 | 0.4 | 7.0 | 3.5 |
| 1 | 0.10 | 0.5 | 0.5 | 10.0 | 4.0 |
| 0 | 1 | 1.0 | 0.8 | 15.0 | 5.0 |

Innovation Scoring



| S C O R E | Method Generation Rate | Method Improvement Rate | Customer compliment Rate | Awards Rate | Training and learning Rate |
|----------------------------------|---------------------------------------|--|---|--------------------|---------------------------------------|
| 5 | 4 | 3 | 2 | 1 | 5 |
| 4 | 3 | 2 | 1 | 0.5 | 4 |
| 3 | 2 | 1 | 0.5 | 0.25 | 3 |
| 2 | 1 | 0.5 | 0.25 | 0.1 | 2 |
| 1 | 0.5 | 0.25 | .1 | 0.05 | 1 |
| 0 | 0.1 | 0.1 | 0.0 | 0.0 | 0 |

What We've Learned

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- Generally good safety record
- No major quality incidents
- High method development rate
- High compliment rate
- Very high training and learning rate
- Biggest challenges are turnaround times, minor safety incident rates, and budget tracking.

Questions

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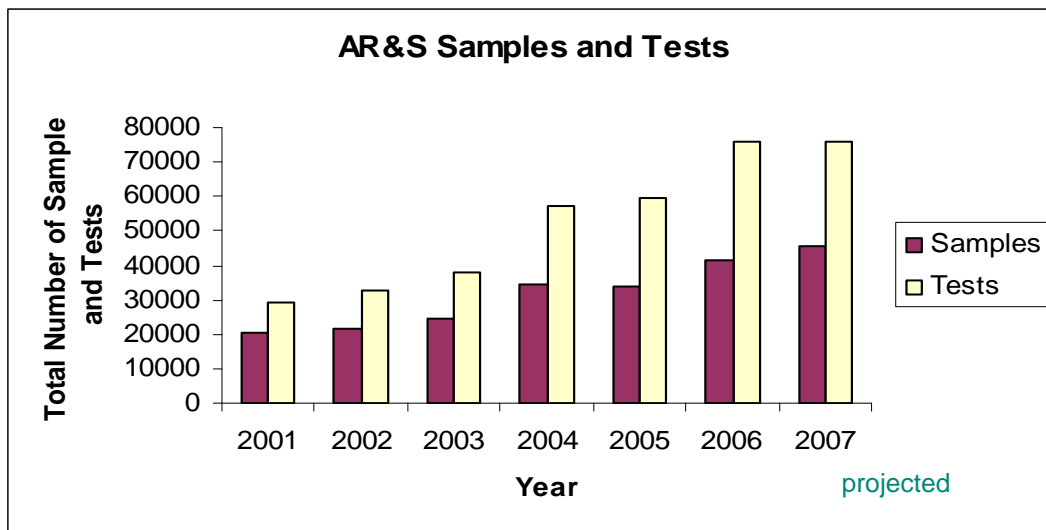
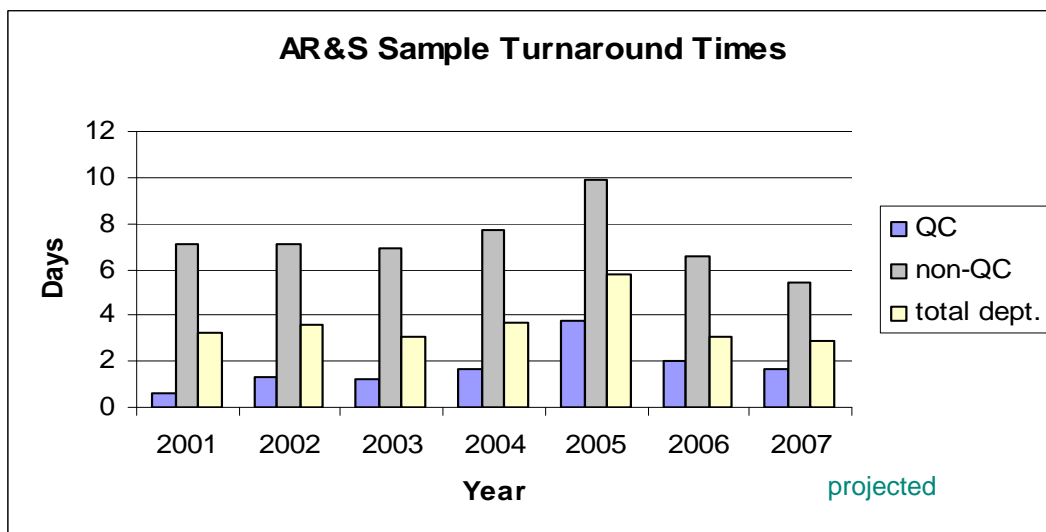
- When does the clock start on samples and methods?
- How do you get problem-solvers to use lims on time?
- How do you track/reduce costs a) when SAP doesn't track maintenance charges, and b) for constantly changing customer and chemistry base?
- How do you encourage safety incident reporting when it negatively impacts the scoring?
- What are the appropriate rewards and incentives?

Accomplishments

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- Increased documentation
- Improved and more accurate turnaround times
- Upper management attention and appreciation
- Focus on innovation and service to customer base
- Teamwork (and morale?)

Turnaround: Samples and Tests



Leadership Team

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- Vernon Brandt
- W. Tyler Cobb
- Rich Holub
- Don Imhoff
- Glen McClelland
- Charles Modenbach