Lumber Size Control Studies
Lumber Size Control

- Troubleshoot machine center performance
  - Locate & identify problems
  - Stabilize & improve sawing accuracy
  - Reduce oversizing

- Objective is to improve
  - Lumber recovery
  - Sawmill efficiency
  - Productivity
Lumber Size Control

Purpose

- Stabilize & improve sawing accuracy—reduce lumber size variation (thick & thin lumber)
- Troubleshooting—locate & identify problems in sawing machine centers
- Properly adjusting lumber target sizes—control oversizing/undersizing to improve lumber recovery and grade yield
Thick & Thin Lumber
Study Procedures

Sampling

- Requires 50-100 study boards per machine center (or saw to saw pocket on gang saws)

- Sample 25-50 subgroups of 2 consecutively produced boards (3 successive sawlines or two consecutive pieces on gang saws)

- Maintain order of production (i.e., order in which subgroups are manufactured)
Study Procedures

Measuring & Recording Procedures

- Use a calipers to take 4-5 measurements on both edges on each board (8-10 total measurements per board)

- Record measurement data (0.001 in.), time & comments

- Note what is going on in the mill during sampling (saw snaking, hit metal, overfeeding the saw)
Study Procedures

Study Sampling & Measurement Positions
Study Procedures
Subgroups of 2 Consecutive Boards
Measuring Lumber Thickness

Take 8 measurements per board & record to the nearest 0.001 inch
Study Procedures

Measurement Location on Study Boards

Top Edge - First End into Saw

Bottom Edge

Trailing End
Lumber Size Analysis

- Components of lumber size variation
  - Average measured size
  - Within-, between-, and total-sawing variation
- SPC-LSA computer routine—demonstration
- Interpretation & troubleshooting—causes of lumber size variation
Components of Lumber Size Variation

- Average Measured Size ($\bar{X}$)
- Components of Lumber Size Variation
  - Total variation ($s_t$)
  - Within-board variation ($s_w$)
  - Between-board variation ($s_b$)
- Calculated with SPC-LSA program
Interpretation of Lumber Size Variation

- Between-board variation—setworks system
- Within-board variation—sawing system
- Patterns of lumber size variation
  - End-to-end taper
  - Edge-to-edge wedging
  - Thick or thin ends
  - Snake
SPC-LSA Computer Routine

- Compiled MS-DOS based PC software
- Calculates the components of lumber size variation & oversize/undersize
- Graphical analysis reports (histogram, variation range graph, specification chart)
- Lumber size control charts (average, within- & between-board variation)
Class Exercise - Statistics

- Described a set of numbers
  - Calculate average
  - Measures of variation
  - Shape of its distribution

- Statistics uses simple arithmetic

- The hardest thing about “Statistics” is its pronunciation