



**THE SCS IN-KILN MOISTURE METER
For
NEKDA**

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(Proprietary and Confidential)

AGENDA

- SCS Forest Products
- SCS In-kiln Moisture Meter
 - Components
 - Benefits
 - Establishing the correlation between MC and Capacitance
 - Payback
- ProTrac: Tracking MC from the Kilns to the Planer

SCS FOREST PRODUCTS

BACKGROUND

- Founded 15 years ago
- End-to-end moisture measurement product solution (sawmill, kiln, planer mill)
- Offices in US & Canada
- Customers:
 - 150 kiln systems
 - 140 planer mill
 - 100 sawmill systems

SAMPLE CUSTOMERS



SAMPLE PARTNERS



PRODUCT LINE

INTEGRATION

**Transverse Sawmill
Meter**



MC Pro 1500

**In-Kiln Moisture
Meter**



MC Pro 2000

**Transverse Planer
Meter**



MC Pro 2400

**In-Line Planer
Meter**



MC Pro 2500

ENGINEERING

SERVICE

OPTIONS FOR TERMINATING DRYING

Time-based schedules:

Kiln follows a schedule/recipe for set amount of time and shuts down at a variable moisture content

TDAL

Kiln follows a schedule/recipe for a variable amount of time and shuts down when a predetermined temperature drop across the load is achieved

Weight /Strain Gauge

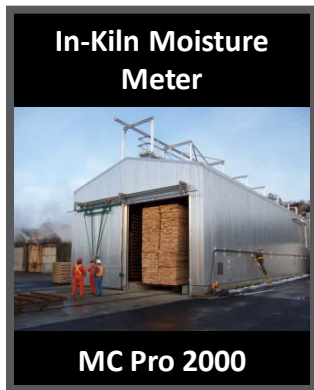
Kiln follows a schedule/recipe for a variable amount of time and shuts down when a predetermined weight loss or strain is achieved

In-kiln Moisture Meter

Kiln follows a schedule/recipe for a variable amount of time and shuts down when a predetermined weight loss or strain is achieved

IN-KILN MOISTURE METER

MC PRO 2000



- Automatically measures the moisture content of the lumber as it dries and reports it to the kiln controller.
- Uses capacitance measurements to calculate moisture content.
- Each measuring point uses two metal plates inserted into the lumber package.
- Enables the kiln controller to determine the optimum time to shut down the kiln.

IN-KILN MOISTURE METER

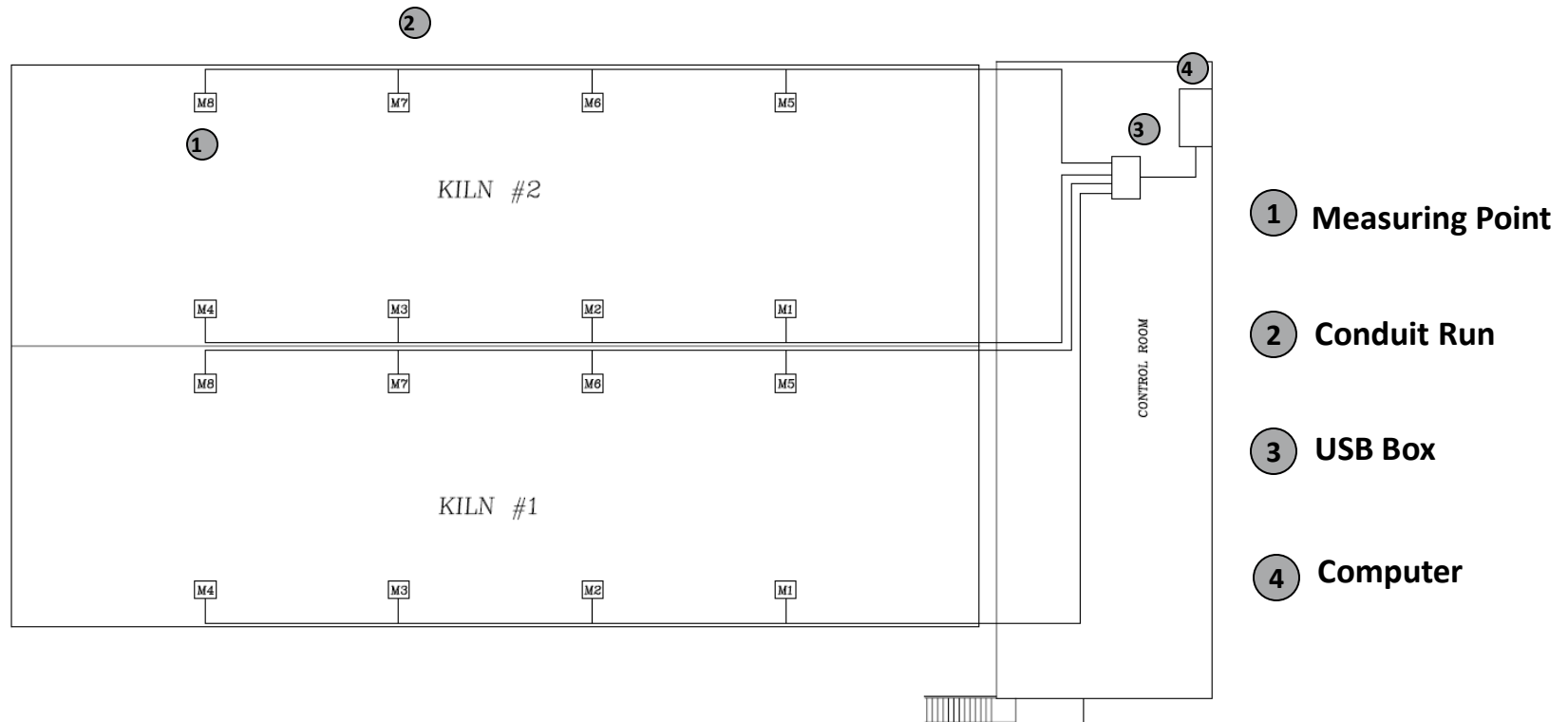
MC PRO 2000

FEATURES AND BENEFITS

Product Feature	Benefit
No electronics in or near the kiln	Eliminate the costly problem of meter failures due to exposure to environment.
Off the shelf hardware	No longer held hostage by a vendor. Can order parts directly from any local distributor.
Open architecture software; off the shelf operating system	Easily integrate to existing systems. Training is quick and easy.
Simple conduit runs	Reduce costly kiln downtime to ½ day for installation and commissioning. No hanging arrays in the kiln that are subject to mechanical failure.
Proven accuracy	Confidently eliminate costly hot checks.

IN-KILN MOISTURE METER MC PRO 2000

DRAWING OF KILN INSTALLATION



IN-KILN MOISTURE METER MC PRO 2000

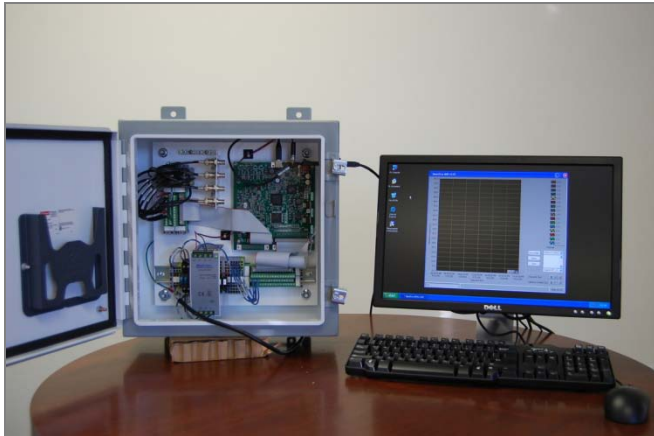
MEASURING POINTS AND PLATE CONNECTORS



- Stainless steel plates are inserted between tiers of lumber
- Stainless steel cables connect to the plates from the junction box using clips. The only wear items for the entire system are the clips, plates and stainless steel cables.
- No electronics located out at the kiln.

IN-KILN MOISTURE METER MC PRO 2000

ELECTRICAL COMPONENTS



- Standard conduit runs inside and outside of the kiln to connect to relay boxes
- Conduit can be sleeved or threaded depending on the mill's choice.
- Coaxial cable is 0.22", Teflon-coated with temperature ratings from -70°C to +200°C

IN-KILN MOISTURE METER FITTING THE MODEL

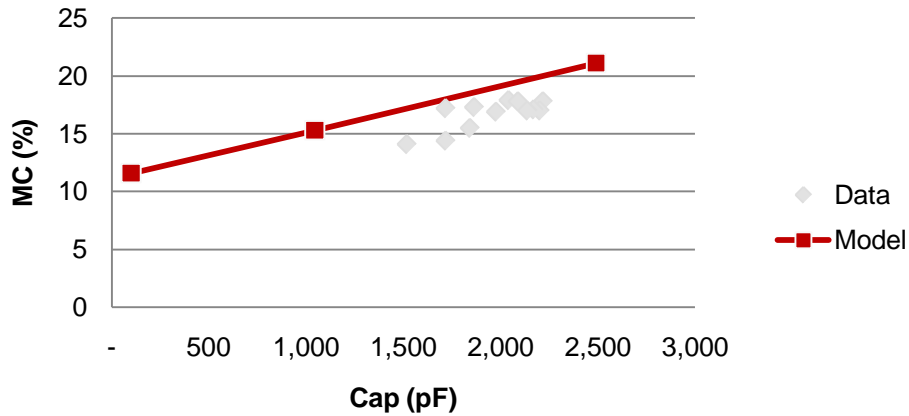
ESTBALISHING A CORRELATION BETWEEN THE MC PRO 2000 AND THE IN-LINE PLANER METER OR HANDHELD MOISTURE METER: COLLECT DATA

Date/time the charge exited the kiln	Charge #	Kiln #	Dimension	Species	Desired MC % (at the planer)	MC Pro 2000 MC% at kiln shutdown	Hotcheck MC%	Planer MC% results
01/02/2007 4:30am	1001	1	2x4	SPF	15.0%	15.0%	17.2%	14.0%

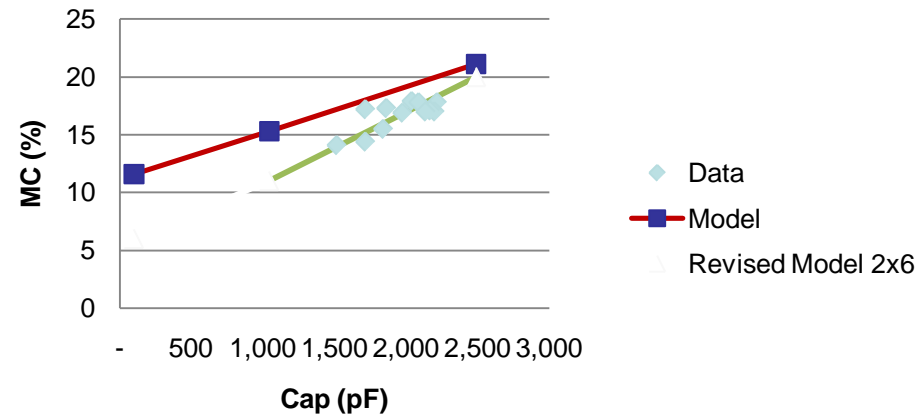
IN-KILN MOISTURE METER FITTING THE MODEL

ESTABLISHING A CORRELATION BETWEEN THE MC PRO 2000 AND THE IN-LINE PLANER METER OR HANDHELD MOISTURE METER: FIT BEST MODEL

Moisture Correlation (default model)

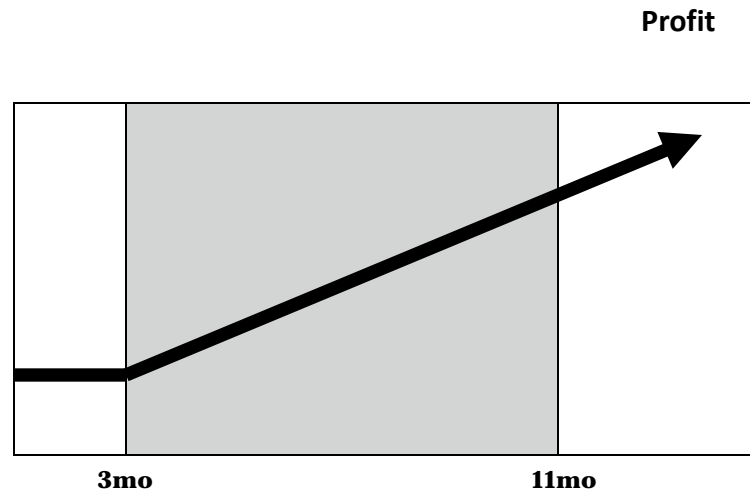


Moisture Correlation (revised model)



IN-KILN MOISTURE METER PAYBACK

MOST MILLS REALIZE PAYBACK IN 4-6 MONTHS



Areas of Benefit

Productivity

Moisture Grade Improvement

Energy Savings

Safety

Typical Savings

5-15%

1-3%

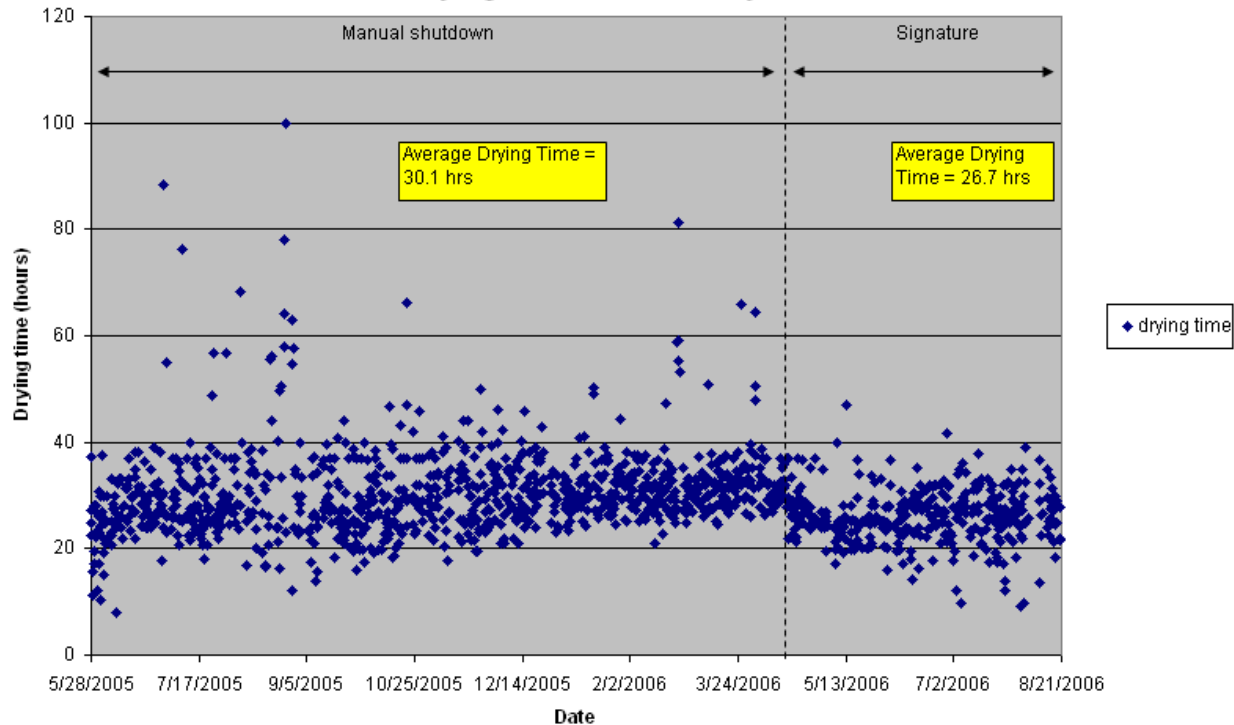
(Depends on mill)

(Depends on mill)

IN-KILN MOISTURE METER PAYBACK

AVERAGE PRODUCTIVITY IMPROVEMENT IS 10%

Reducing Energy Costs and Increasing Productivity: Average
Drying Time Reduced by 11%



IN-KILN MOISTURE METER PAYBACK

ADDING UP THE PRODUCTIVITY SAVINGS

Reduced Drying Time

Current drying time	38
Drying hours per year	7040
Charges per year	185
New drying time (10% improvement)	34
Charges per year (10% improvement)	206
Additional charges per year	21
Value added (profit per 1000 fbm)	20
<i>Productivity value (\$)</i>	99,540

Reduced Energy Costs

Energy cost (\$ per cubic foot)	0.01
Energy usage per hr (12MMBTU)	4,341
Reduced charge time (hrs)	3.8
Energy Savings (\$ per charge)	150
Energy Savings (\$ per year)	27,705



Productivity Value: \$127,245

Data is from a real mill

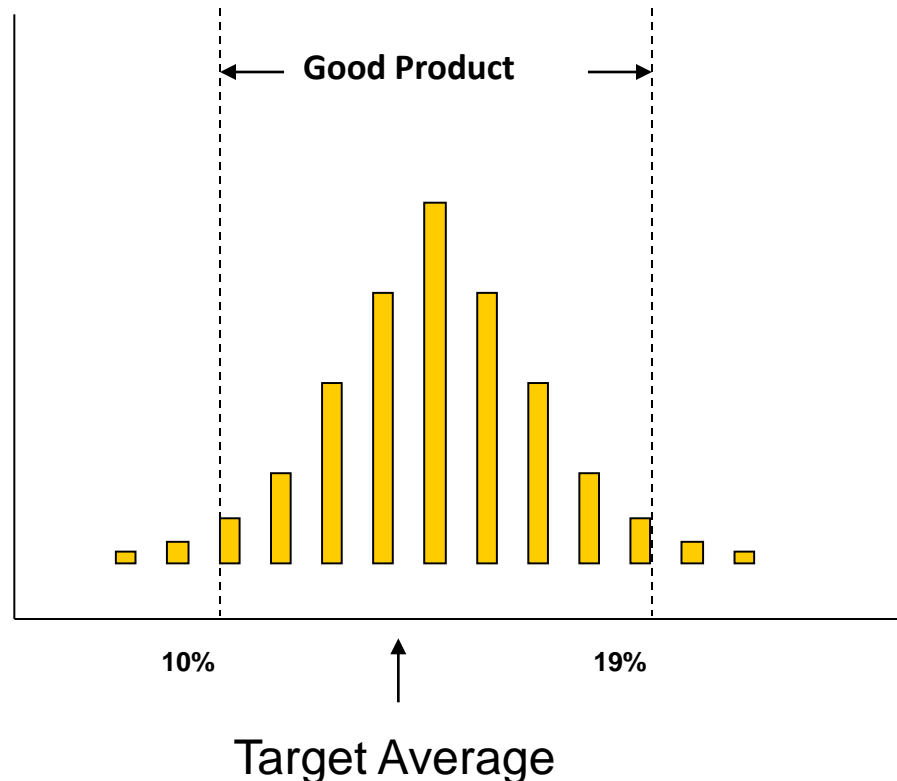
Assumptions:

- One kiln with 237 Mfbm capacity
- Average drying time of 38 hrs
- Natural gas price of \$0.01/cubic foot

IN-KILN MOISTURE METER PAYBACK

AVERAGE GRADE IMPROVEMENT 1-2%

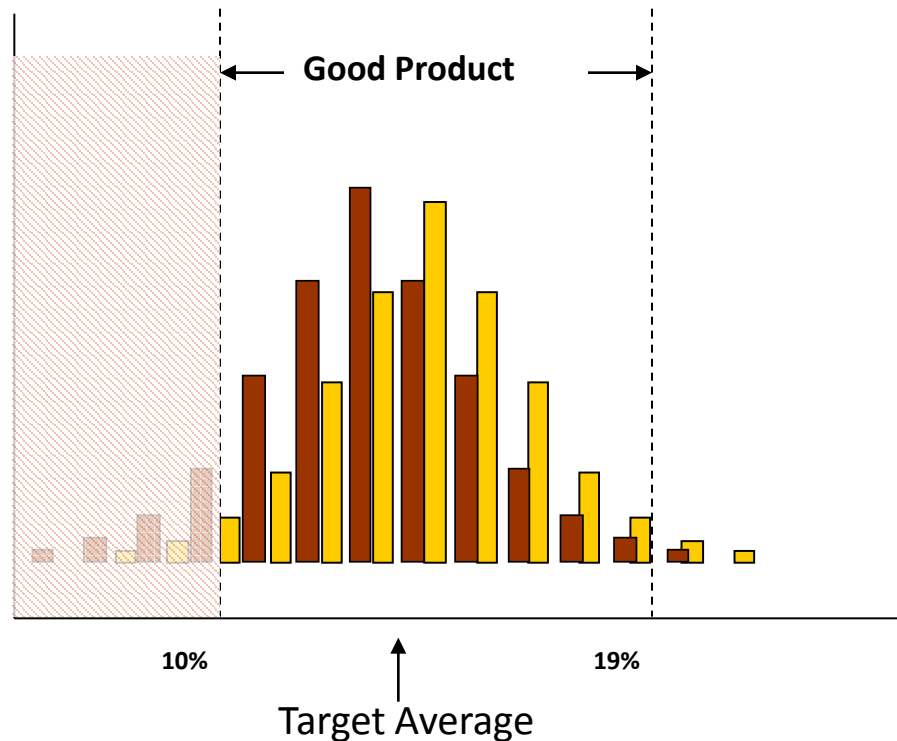
Charge 1: Using hand-held moisture meter to estimate moisture content, the charge is pulled and shows exactly 15% at the planer mill. This is a perfectly executed scenario.



IN-KILN MOISTURE METER PAYBACK

AVERAGE GRADE IMPROVEMENT IS 1-2% CON'T

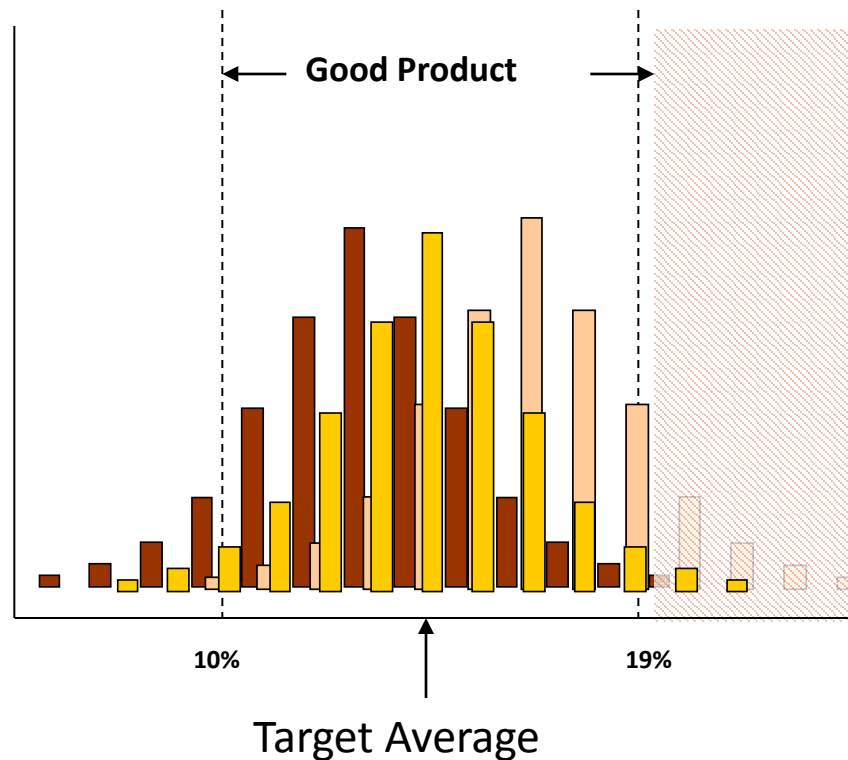
Charge 2: Using hand-held moisture meter to estimate moisture content, the charge is over-dried and shows an average of 13% at the planer mill.



IN-KILN MOISTURE METER PAYBACK

AVERAGE GRADE IMPROVEMENT IS 1-2% CON'T

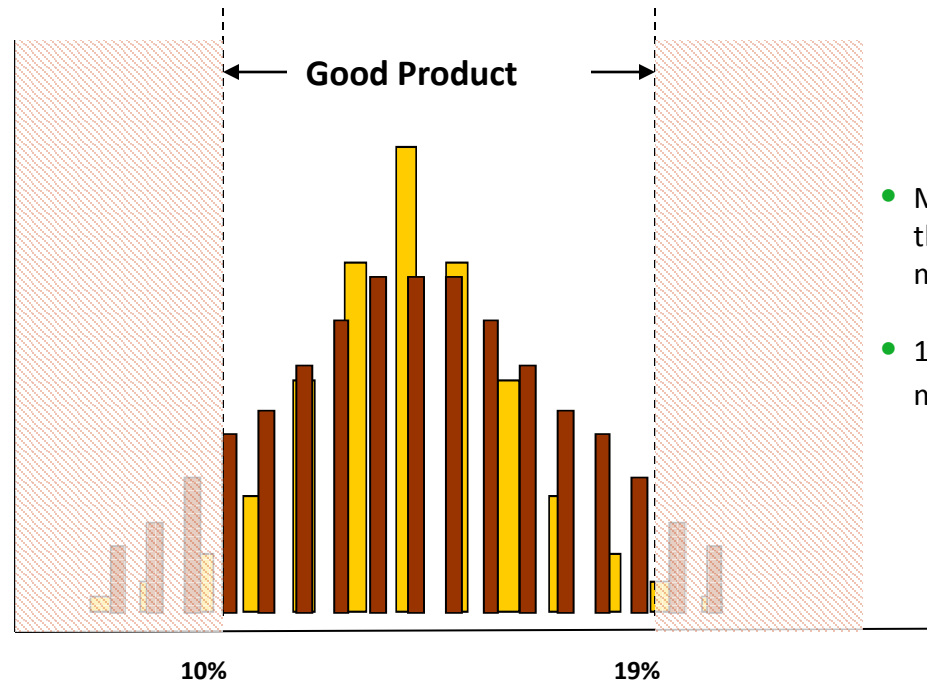
Charge 3: Using hand-helds to estimate moisture content, the charge is actually too wet and shows an average of 17% at the planer mill.



IN-KILN MOISTURE METER PAYBACK

AVERAGE GRADE IMPROVEMENT IS 1-2% CON'T

The aggregate distribution of the three previous charges are plotted. Missing the target on the three charges can result in a wider standard deviation, leading to grade loss.

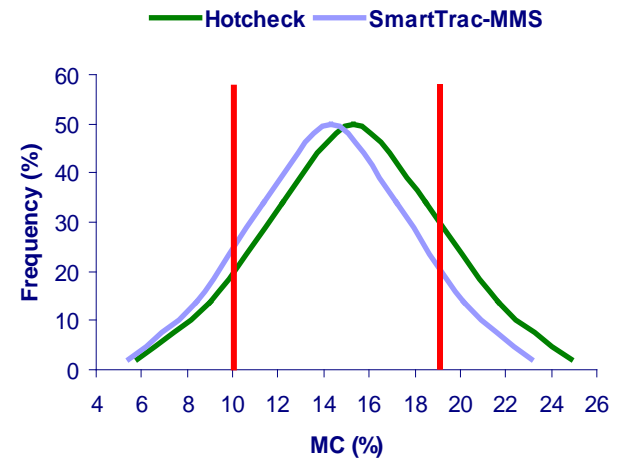


- MC Pro 2000 dramatically reduces the aggregate distribution of moisture content
- 1% improvement over hand-held methods.

IN-KILN MOISTURE METER PAYBACK- IMPACT OF MEASUREMENT ERROR

MOISTURE GRADE IMPROVEMENT SAVINGS ARE SIGNIFICANT

MC PRO 2000 (shutting down at target MC%)		HOT CHECKS (missing target by 1%)	
MC (%)	STD DEV(%)	MC (%)	STD DEV(%)
15.00	3.00	16.00	3.00
% BOARDS BETWEEN 10% AND 19%			
92%		87%	
% BOARDS > 19%			
8%		13%	
COST OF MISSING MC TARGET			
ADDITIONAL 5% OF PRODUCTION NOW DOWNGRADED WET			



Note: if standard deviation slips to 3.3% due to missed targets, then difference = 7%

IN-KILN MOISTURE METER PAYBACK - ACCURACY

ACCURATE TO WITHIN +/- 1% OF PLANER MILL READINGS

Performance data of a kiln using *MC Pro 2000*:

- Number of 2"x6" kiln charges shutdown by MC Pro 2000 in this kiln study = 76 (1.72 million boards)
- Desired MC at Planer Mill = 15%
- Actual Ave MC at Planer Mill = 15.3%
- Typical over-dry lumber (under 10% MC) = 3.6%
- Typical under-dry lumber (over 19% MC) = 1.4%
- Typical lumber yield (10% to 19% MC) = 95%

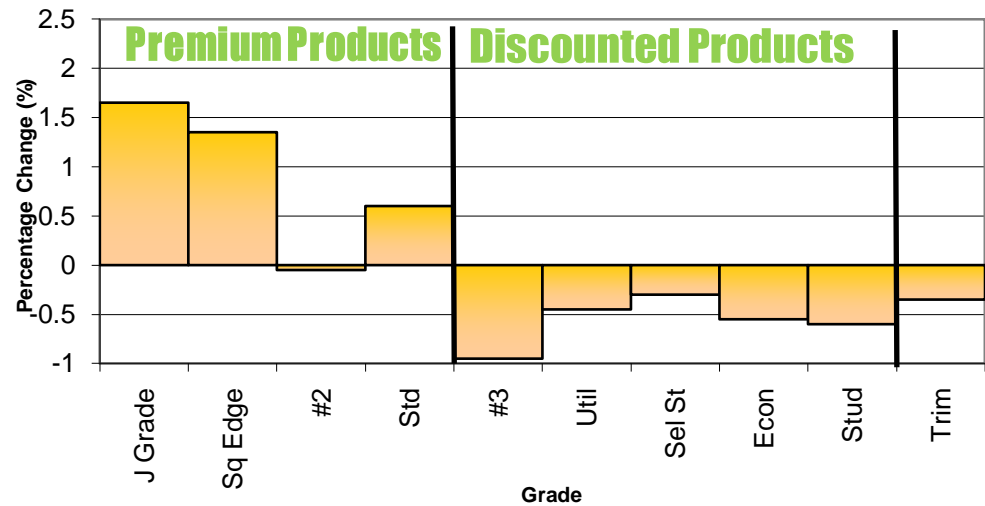
In-Kiln Moisture Meter PAYBACK

QUANTIFYING THE BENEFITS:

Grade		Net Benefit
Primes		1.0%
#2		0.55%
Low Grades		-1.95%
Trim Loss		-0.35%
Prime Cash Value	\$	320,000
#2 Cash Value	\$	2,200
Low Grades Cash Value	\$	390,000
Trim Loss Cash Value	\$	7,000
Grade Recovery Value	\$	719,200

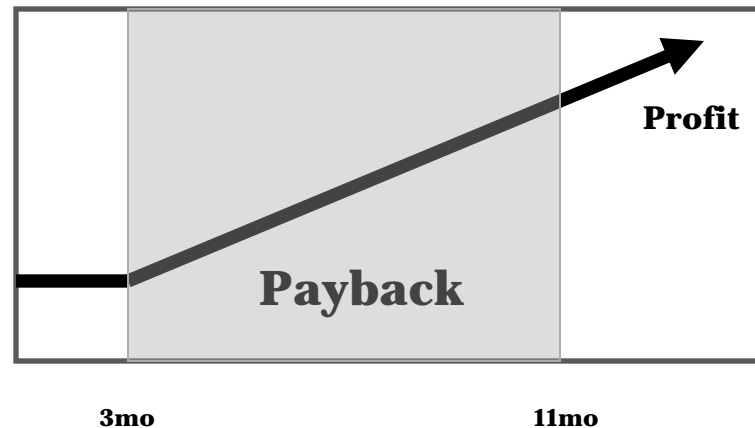
Assumptions		
Annual Production		400,000,000
Prime Grade Premium	\$	80
#2 Differential	\$	1
Low Grade Differential	\$	(50)
Trim loss Differential	\$	(5)

Net Effect of MC Pro 2000 on Grade Recovery



IN-KILN MOISTURE METER PAYBACK

AVERAGE CUSTOMER PAYBACK IS 4-6 MONTHS



Calculation:

Productivity improvement of 10% \$127,245

Moisture content/grade improvements of 4% \$87,690

Less value to allow for natural defects (30-40%)

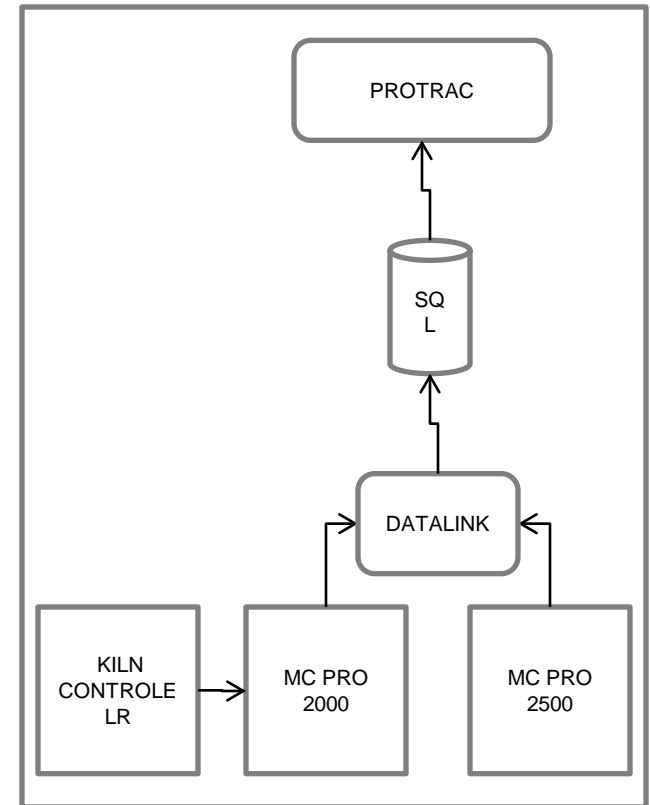
3-4mo Payback

Note: Real data from a mill

PROTRAC: INTEGRATED REPORTING

PROTRAC:

- Integrates Kiln & Planer moisture meters
- Reports can be viewed by anyone that is connected to the network.
- Initial focus of reports is to increase the speed that data is shared between the planer and kiln operators. Why? Reduce the time it takes to recognize a problem so that adjustments can be made and less lower grade wood is produced.
- Transparency will increase as all users view the same data.



CONTACT INFORMATION

Thank You!

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