

Convert Maintenance & Reliability Issues To Business Issues

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Use Process Reliability Plots To Get The Numbers

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The Big Picture View--

- Do you have a **maintenance/reliability problem** or a **production problem**?
- Are your problems due to **common causes** (small variations with “natural” reasons)
- Are your problems due to **special causes** (larger variations with assignable reasons)?
- **How can you prove your point and what is the business issue explained in \$'s?**

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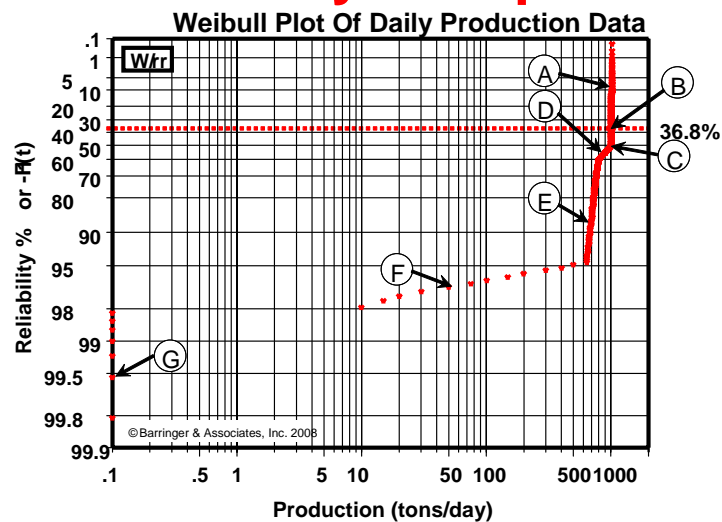
Make A Weibull Plot Of Production Output

- Why make a Weibull plot?—**Production data usually makes straight line segments on a Weibull plot and you can clearly see performance patterns.**
- Why use 365 days of production data? **It provides your score card for a year of effort and production data is a precursor for money.**

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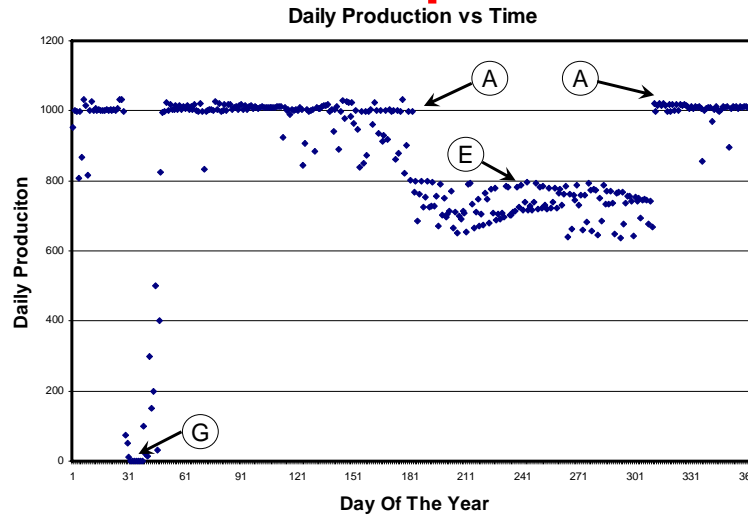
Make A Weibull Plot Of 365 Days Output



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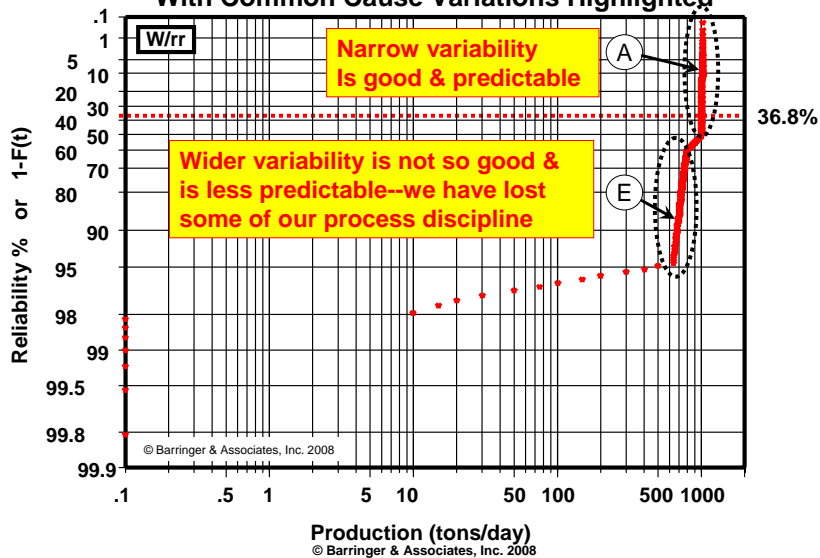
Do You See The Same Patterns In This Time Sequence Plot?



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Common Causes

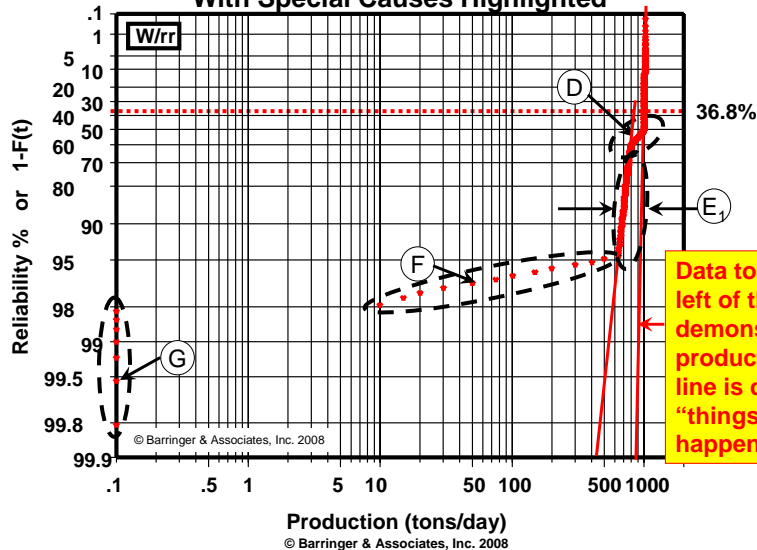
**Weibull Plot Of Daily Production Data
With Common Cause Variations Highlighted**



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Special Causes

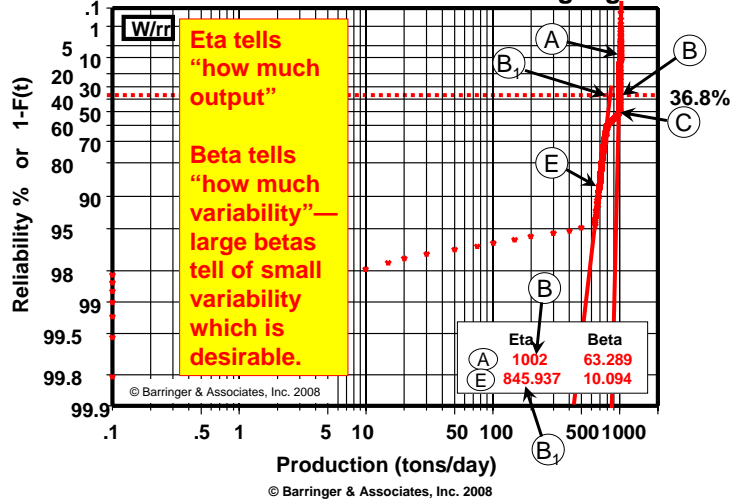
Weibull Plot Of Daily Production Data
With Special Causes Highlighted



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What About The Trendlines?

Weibull Plot Of Daily Production Data
With Common Cause Trend Lines Highlighted



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What Betas Should I Have?

Typical Values Of Beta For Process Weibull Plots

Typical Beta Values Observed In Various Industries

	Poor	Fair	Tighter	Excellent	World Class	Seldom Achieved
Beta→	5	10	25	50	100	200
Quartile	Fourth	Third		Second	First	
Rule Of Thumb: <i>Double beta and cut losses by 1/2</i>						

We see too many examples of small betas with much waste

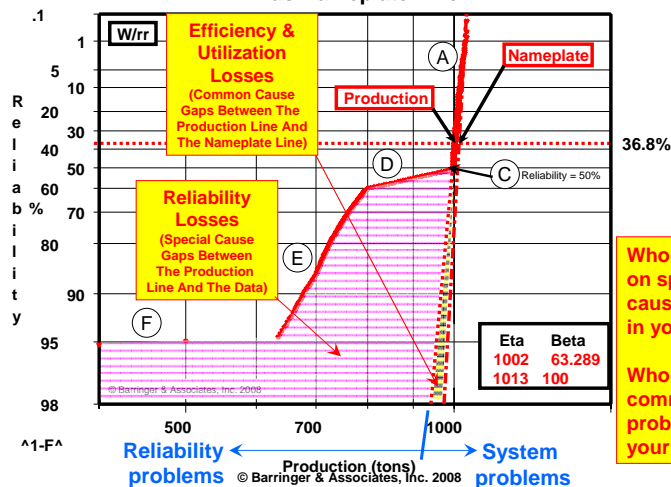
We see too few examples of large betas

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Zoom-In On Upper Curves

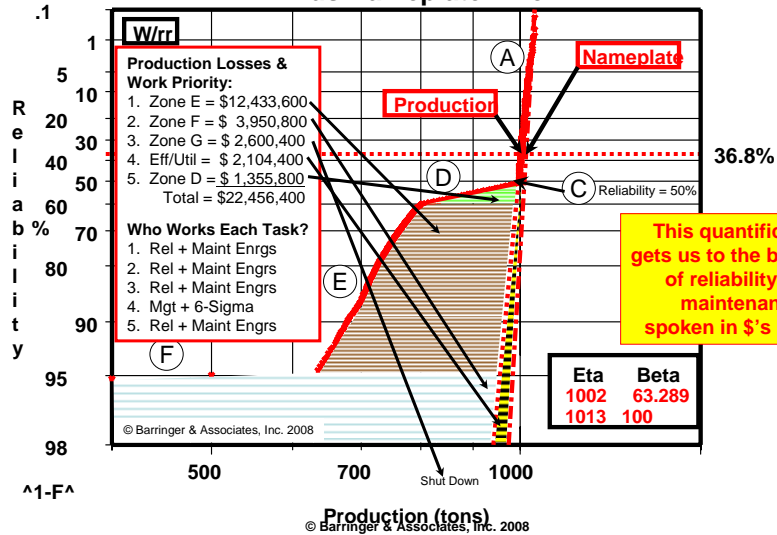
Weibull Plot Of Daily Production Data Plus Nameplate Line



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Pareto List Of Problems

Weibull Plot Of Daily Production Data
Plus Nameplate Line



Understand What's Happening

- Cutback zone E is the major problem—**why?—how do you fix it?**
- If zone E is due to lack of orders—**what action do you take?**
- Zone E has much variability?—**why the loss of process discipline (small betas)?—what will you do?**
- When zone E is restored to the production line—**what happens to zone D?—why?**

Summary

In many cases, the issues to resolve involve establishing process discipline!

- Get your reliability program right-**time & money**
- Think of reliability issues strategically--**dollarize**
- Look for gains **first** via people, **second** by processes and procedures, and **last** by way of components—**many component issues disappear when people/processes/procedure issues are solved to achieve inherent component reliability!**
- Show your organization how you're doing with process Weibull plots: **Show me, don't tell me!**
- **Produce positive results—quickly!**

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For More Details

- See <http://www.barringer1.com/oct08prb.htm>
- See Edelson & Bennett, **Process Discipline**, Quality Resources, New York, 1998, ISBN 0-527-76345-4

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