

Verification Metrics

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Verification Metrics: Why do we care?

- Predicting functional closure of a design is hard
- Design verification is typically the critical path
- CPU design projects rarely complete on schedule
- Cost of failure to predict design closure is significant

Two key types of metrics

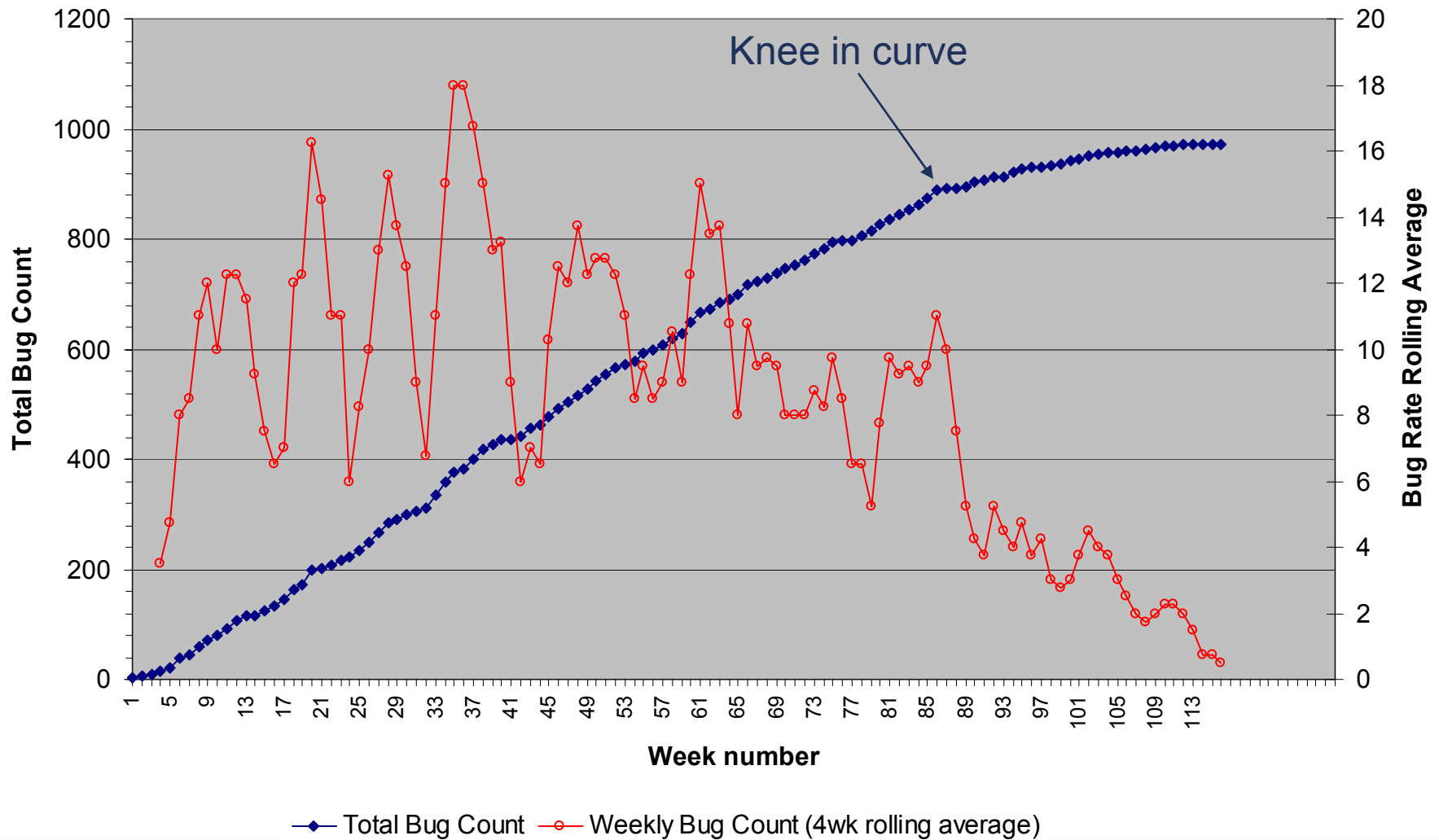
- Verification test plan based metrics
 - Amount of direct tests completed
 - Amount of random testing completed
 - Number of assertions written
 - Amount of functional coverage written and hit
 - Verification reviews completed
- Health of the design metrics
 - Simulation passing rates
 - Bug rate
 - Code stability
 - Design reviews completed

Challenges and limitations

- Limitations of test plan based metrics
 - Will give a best case answer for completion date
 - The plan will grow as testing continues
- Limitations of health of the design based metrics
 - Can give false impressions if used independent from test plan metrics
 - Requires good historical data on similar project for proper interpretation
- General concerns to be aware of for all metrics
 - What you measure will affect what you do
 - Gathering metrics is not free
 - Historical data can be misleading
 - Don't be a slave to the metrics:
 - they are a great tool, but not the complete answer

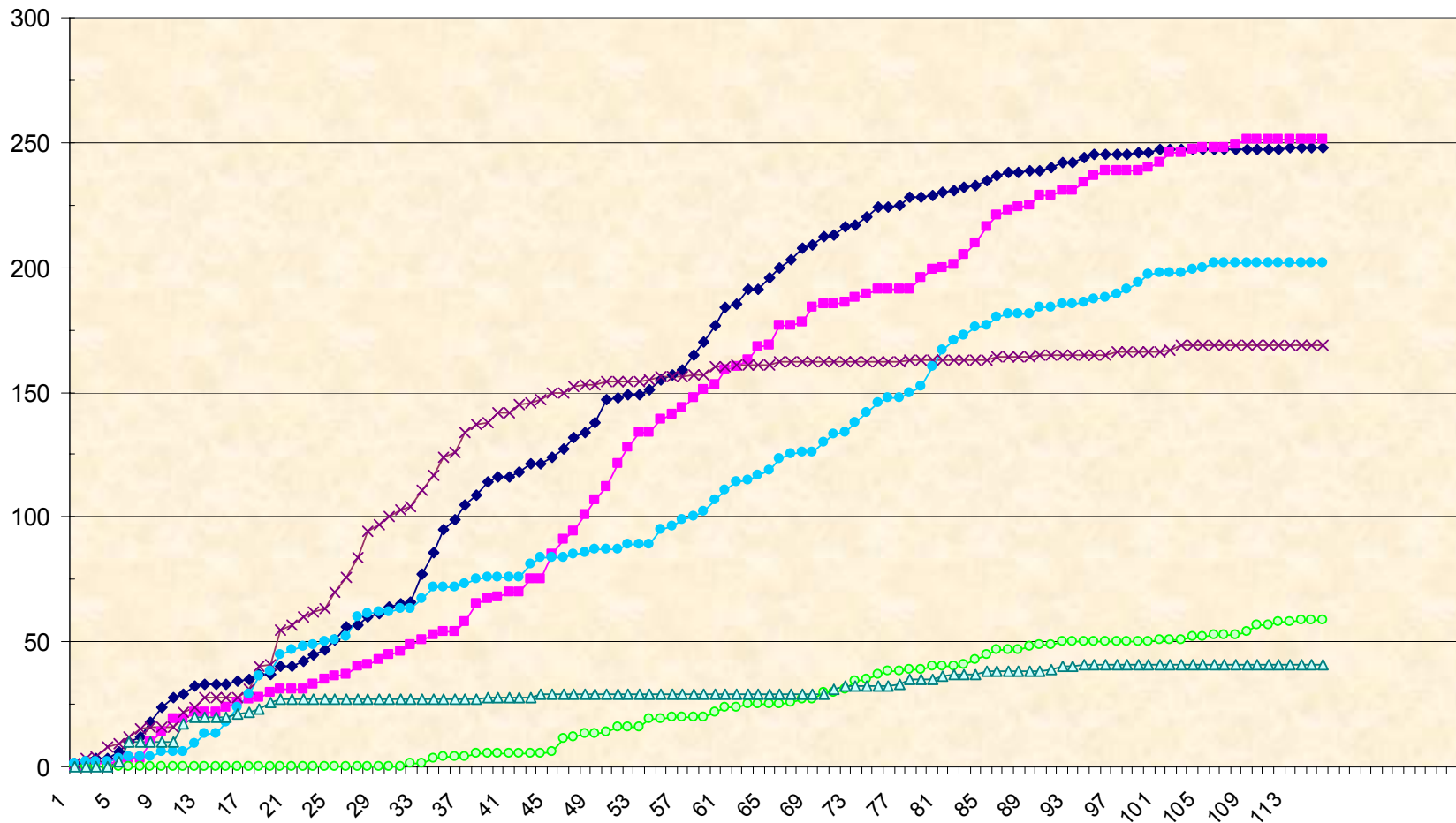
Bug rate example

Bug History



Bug rate by unit example

Bug breakdown per design unit



Functional Coverage closure example

Functional Coverage Closure

