

Agenda



- Introduction
- GQM
- Release Criteria – a measuring stick for release readiness
- Measuring Scope Coverage
- Measuring Quality
- Code Volatility and Defect Aging
- Proactive approach towards Quality
- Conclusion
- Q&A

Are We Ready to Release?



- Voting – Thumbs UP OR Thumbs Down
- I feel its good quality – gut feel, hunch
- Product meets business goals –
 - Providing value to the customer
 - Achieving revenue and profit goals
 - Enhancing brand image

Applying GQM To Release Quality



- GOAL – Deliver a quality product on schedule
- Question –
 - Would we be able to deliver the intended functionality on time?
 - Would the functionality have intended quality?
- Metrics
 - Scope Coverage
 - Quality Measurements

What is a Release Criteria?



- Definition – a documented set of conditions that has been agreed upon by the stakeholders and must be met before releasing the product.
- Areas to Set the Conditions Around
 - **Requirements Coverage**
 - **Test Coverage**
 - **Defect trends by Severity**
 - **Highest Severity Open Defects not Planned to be Fixed**
 - **Number of Defects Fixed but NOT Verified**
 - **Code Volatility Measures**
 - **Other Release Readiness aspects:**
 - **Training and Support Requirements**
 - **Invention Disclosures**

Release Criteria - Example



Criterion	Description	Owner
Functionality/ Requirements	100 Percent of the planned requirements completed	Development Manager
Test Coverage	100 percent test cases executed	QA Manager
Defects	<ul style="list-style-type: none"> 100 percent “high severity” defects addressed as either: <ol style="list-style-type: none"> Fixed, verified, and closed Workarounds available where possible Support cost estimated and agreed upon 100 Percent customer impacting “medium severity” defects understood 100 percent defect fixes verified Find rate declining for 3 consecutive weeks 	Program Manager + QA Manager
Support Readiness	<ul style="list-style-type: none"> Release notes up to date with workarounds where available Documentation/Training material ready 	Support Manager
Marketing Readiness	<ul style="list-style-type: none"> Rollout plans ready and communicated 	Marketing Manager
Development	<ul style="list-style-type: none"> Intellectual property activities completed Open defects moved to next release 	Program Manager



- **New Functionality Testing**
 - Following Test Strategy/Plan
 - Create Scope Coverage Matrix
 - Creation of Test Cases
 - Test Case Execution
 - Enhancing Test Cases for Efficiency and Effectiveness
 - Defect Logging
 - Defect Reproduction and Resolution Support
- **Regression Phase**
 - Test Case Re-execution for Defect Fix Verification
 - Reopen Defects
 - Re-execution of a Subset of Test Cases
 - Finding New Defects

Release Criteria – % Planned Functionality Complete

A Snap Shot



Functional Area	Test Cases Planned	Planned for execution till date	Executed till date	% of Total planned Executed	% Test Cases Passed	Test cases blocked
User Interface	45	35	32	71	98	3
Database	195	45	12	27	75	8
Output Display	25	20	15	60	99	2
Reporting	40	10	10	25	50	1
Total	305	110	69	22	87	14

Functional Area	User Interface	Database	Output Display	Reporting
Status				



QA Proactive Approach

- Raise awareness
- Identify Risks
- Develop and Implement Mitigation with Stakeholders
- Monitor the situation with Stakeholders

Example: Reporting Functionality

- Testing is on schedule
- A large # of test cases have failed
- Risk – Release criteria will not be met
- Mitigation – Reviews code and design, Improve Development Approach

Other Quality Attributes



- Ease of Installation
- Performance
- Security
- Localization





“Should 100% of defects be fixed?”

Defect Resolution Implies – a defect that is no longer an issue for this release

- Customer Impact – Severity and Frequency (basis of prioritization)
- Support Impact – Cost Incurred in Resolving Customer Problem
 - Release Notes Including workarounds
 - Call Support
- Release Plan
 - Hot fixes
 - Plan for next release
- High Risk of Fixing – too late in the development cycle
- Customer Loyalty and Perception

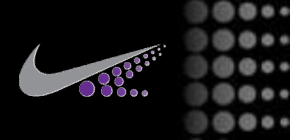


Release Criteria - % Defect Resolved – Resolution (Fix)

Modes of Defect Resolution:

- Code Fix
- Low Customer Impact and Frequency – No Fix Needed
- Relatively Low Support Cost – Easy Workaround
- Planned for a Hot Fix
- Include in Future Release
- High Risk – Impacts Multiple Functional Areas, Future Release

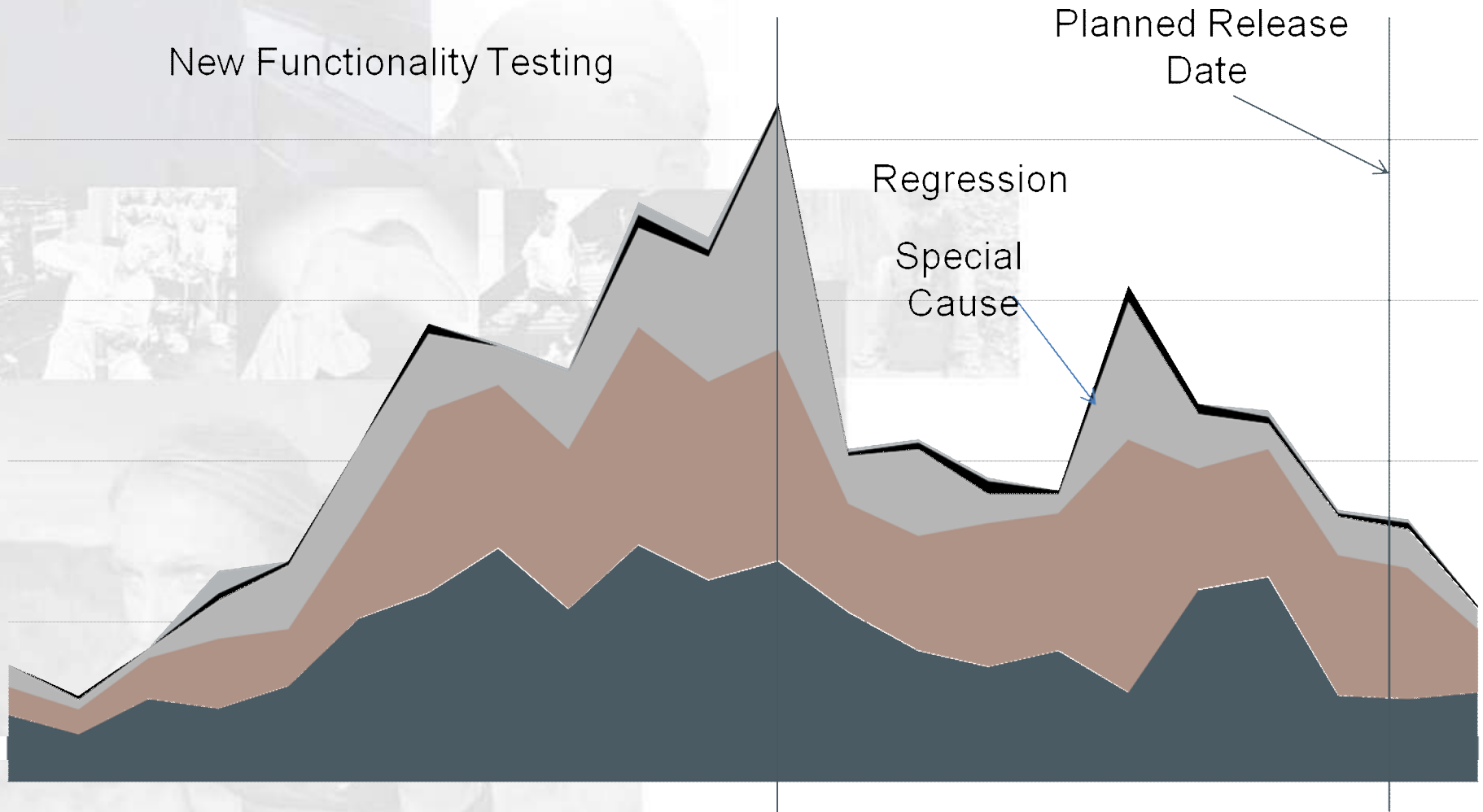
Testing is Time Bound - Find and Fix as many defects as possible by Release Date



Regression

Weekly Defect Find Rate by Severity

■ Urgent ■ High ■ Medium ■ Low ■ None





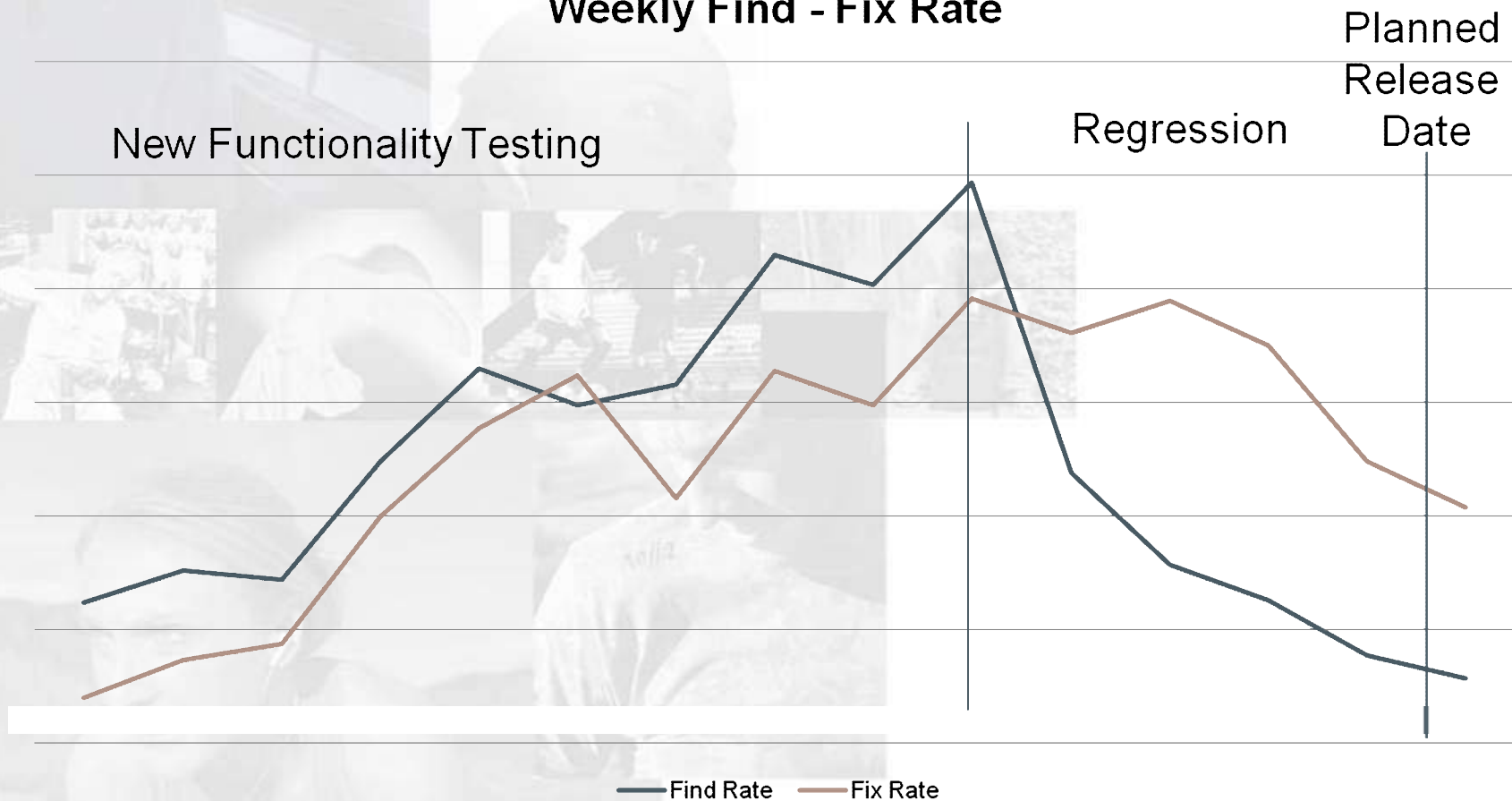
- Initial Ramp-Up
 - Understanding functionality
 - Planned Functionality not Yet Complete OR Blocked
 - End-to-End Workflow not Ready
 - Test Case Repair and Development
- Study Incline and Peak
- Tapering Off
 - Complex Functionality Testing Complete
 - Majority of Functionality Tested
 - Regression In progress
- Special Causes
 - Delayed Functionality
 - Feature Creep
 - Other Aspects – Localization

Release Criteria - % Defect Resolved



Resolution Rate Must keep Up with the Find Rate

Weekly Find - Fix Rate

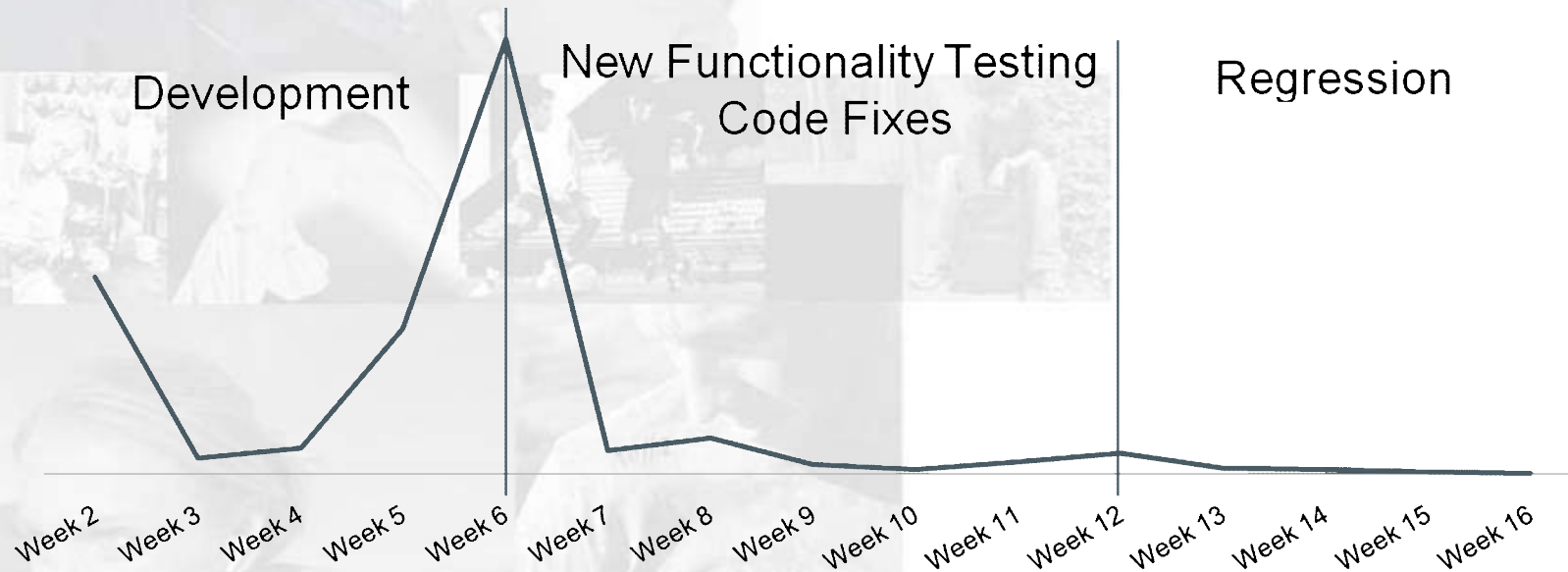


Code Volatility – An Indicator of Defects Introduced



Definition – Lines of Code Delta between Two Release

Weekly % Lines Touched



Code Volatility & Defects Relationship



- Defect Density – Number of Defects per 1K Lines of Code
- Code Volatility – Number of Lines Changed Between TWO Release

Defects Introduced Between TWO Releases
= Defect Density * Code Volatility/1K

Considerations:

- Commented vs. Non-Commented
- Deleted Lines
- Code Reuse (Counted as New lines)
- Change in Environment

Code Volatility Usage



- Number of Defects Anticipated in a Code Drop
- Resources Required
- Test Effectiveness
- Release Readiness – Controlled Code Volatility



Defect Resolution Rate – Defect Aging



Defect Aging – period of time a defect stays in a particular state
Prominent States and Aging Time:

- New – ASAP
 - Immediate Reproduction
 - Need for Logs and other Data for RCA
 - Replication of Test Environment
- Open – Necessary Time to Resolve the Defect
- Fixed – In a Reasonable Time
- Accuracy of Fixed Rate to Meaningfully predict Release Date
- Verified – Don't Care
- Closed – Final State

Ultimately Defect Aging Time is a Business Decision

An Example of Defect Aging

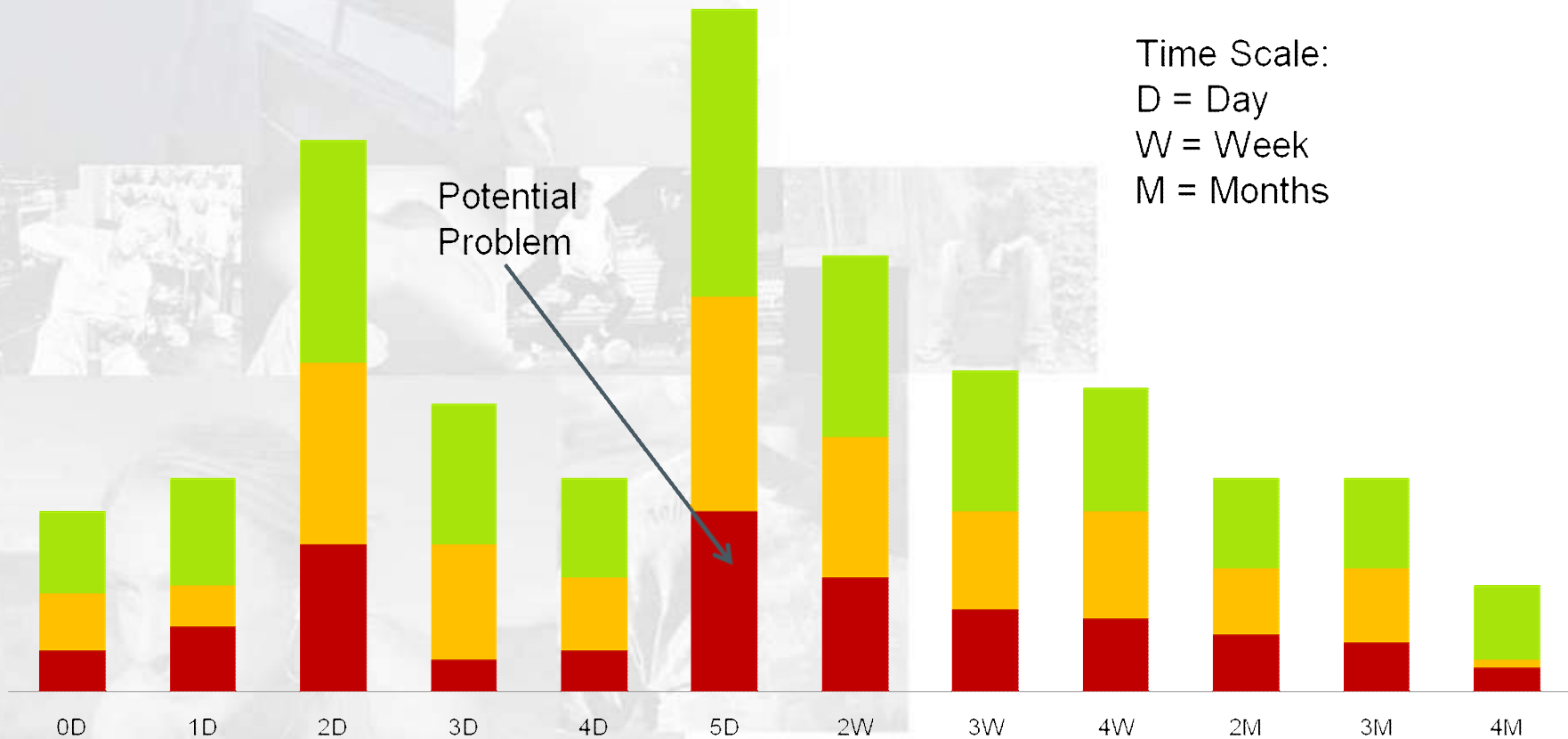


Defect Aging by Severity

■ High ■ Medium ■ Low

Time Scale:
D = Day
W = Week
M = Months

Potential Problem





- We Have Meet the Release Criteria – Kudos to Everyone
 - Functional Coverage
 - Quality Coverage
 - Other Conditions

- We Are Unable to Meet the Release Criteria
Business Decision to move forward
 - Delay the release
 - Pay the cost of poor quality
 - = Support Cost + Customer Loyalty

Proactive QA Approaches



- Prevention is better than cure
- Get to Know the Product Early
- Understand High Risk Functional Areas
- Understand Root Causes for Testing Delays
- Understand Testing Capacity and Resource Needs
- Provide Complete Support for Defect Resolution
- Be Innovative – Use Effective Alternative Testing Approaches
- Remember “we are all in it together”

Conclusion



- Release criteria minimizes the polarity tension
- A release should be bonded by a release criteria
- At any time during testing the QA team can evaluate the progress towards release and act upon the data
- Prevention is better than cure
- A QA organization can proactively improve release quality and help maintain schedule

Thank You.



Questions ??