



ENOUGH IS ENOUGH !!

Jim Barrowman

Masters Forum of NASA Project Managers

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Requirements – Your Project's Foundation

- Get them right up front – the first time
 - Spend time assuring mutual understanding and agreement
 - Formal Process – always
 - Written down and signed
 - Specific and complete
 - Quantitative where possible
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Rossi X-Ray Timing Explorer (RXTE)

- Fixed price project - \$250M
 - 3 instruments
 - Major instrument – Proportional Counter Array
 - 5 proportional counters – largest ever flown
 - Thin film window containing P10 gas
 - Spacecraft and PCA - in-house developments
 - GSFC Engineering Directorate
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RXTE Requirements Documented Early

- Project Plan signed before the end of Phase B
 - Planning given extra attention due to fixed price
 - Level 1 Requirements spelled out
 - XTE – 2 year life
 - PCA – 4 of 5 modules for successful mission
 - Negotiated and signed by Project, Science Team, and Headquarters
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Late-breaking Problem!

- Spacecraft mostly integrated
 - All instruments finishing assembly
 - PCA module developed serious leak
 - Seal between window and frame
 - 4 of 5 sealed OK, 5th leaked badly
 - Scientists worried about design flaw
 - Requested S/C add a P10 replenishment system
 - Engineering Directorate agreed to do it
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Major Hit to Schedule and Cost

- Halt Spacecraft Integration & Test
 - Develop new subsystem
 - Expand test program
 - Complicated PCA interface with Spacecraft
 - Changes to finished PCA modules
 - Other instruments could slip their delivery
 - The Project said “NO!”
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Enough is Enough!

- Project held the line in spite of Pressure from Scientists and Engineering
 - They couldn't argue with the agreed-to requirements
 - Scientists and engineers redoubled their efforts to fix the leak.
 - Confirmed that it wasn't a design problem
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Today...

- RXTE is still scientifically productive
 - 7 years in orbit
 - No PCA degradation
 - RXTE was ready for launch on schedule and ~ \$40M under fixed price development budget
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