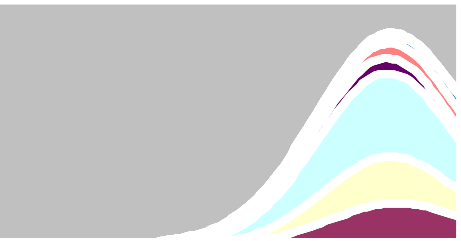


SEATTLE PUBLIC UTILITIES

PROJECT DELIVERY IMPROVEMENTS

Elizabeth S. Kelly PE

Director, Project Management & Engineering Division

Seattle Water Supply System Operating Board

September 2010

ASSET MANAGEMENT

Seattle Public Utilities

BASIC INFO

- Three lines of business
- About 100 projects
- About 30 project managers
- About $750 M in projects on a 5-year basis

VISION FOR PROJECT DELIVERY AT SPU

Delivering the right projects …

VISION FOR PROJECT DELIVERY AT SPU

- Delivering the right projects
  - At the right price…

VISION FOR PROJECT DELIVERY AT SPU

Delivering the right projects

- At the right price
  - Predictable and properly resourced

WHY IS ASSET MANAGEMENT IMPORTANT TO PROJECT MANAGEMENT?

WHY IS ASSET MANAGEMENT IMPORTANT TO PROJECT MANAGEMENT?

- Solid business case & clarity of project objectives
- Clear mission reduces team churning
- Set the stage for meeting Triple Bottom Line expectations
- Better understanding of what defines project success
- Benefit-cost & TBL principles apply throughout project delivery

WHY IS SUCCESSFUL PROJECT DELIVERY IMPORTANT TO ASSET MANAGEMENT?

- Project predictability is important to business cases
- Customers expect cost effectiveness

TOPICS FOR THIS DISCUSSION

Project Delivery Improvement Strategy

Planning for Projects

Governance

Project Controls

Capacity Building

Teaming

PROJECT DELIVERY IMPROVEMENT STRATEGY

Planning for Projects

- Portfolio Management
- System Planning
- Project Management Plans
- Risk Management
- Work Breakdown Structure
- Cost Estimating
- Engage Ultimate Owner (O&M)
- Standard Methodologies
- Scalable
- Contracting Strategies
- Value Engineering

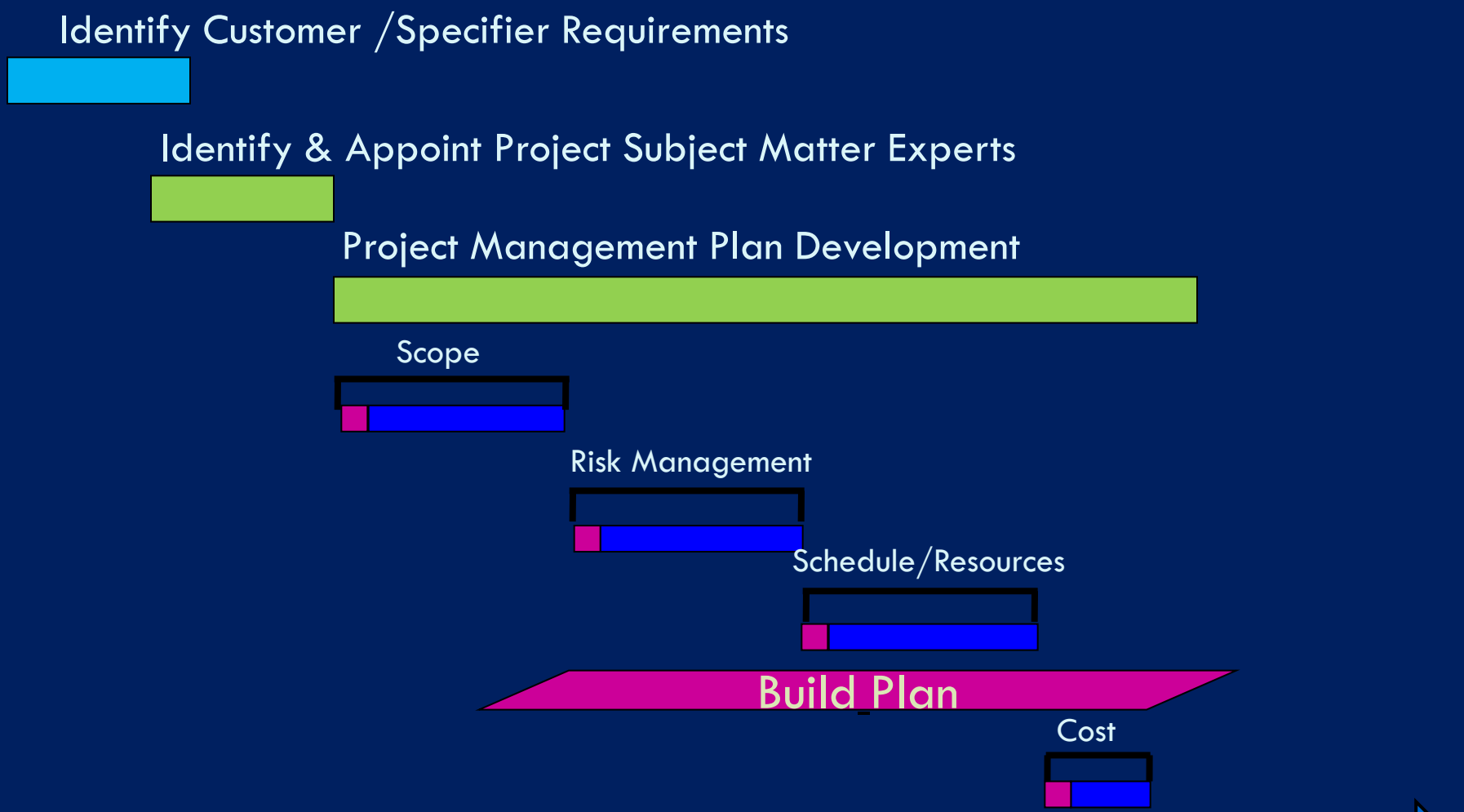
PORTFOLIO MANAGEMENT

- Prioritization
- Communication
- Real time adjustments

PROJECT MANAGEMENT PLANS

- The Requirements
- Scope management
- Schedule management
- Budget management
- Risk management
- Communications management
- Human resources management
- Quality assurance management
- Procurement management

PMP Development Process



IMPORTANT OUTCOMES OF PMPS

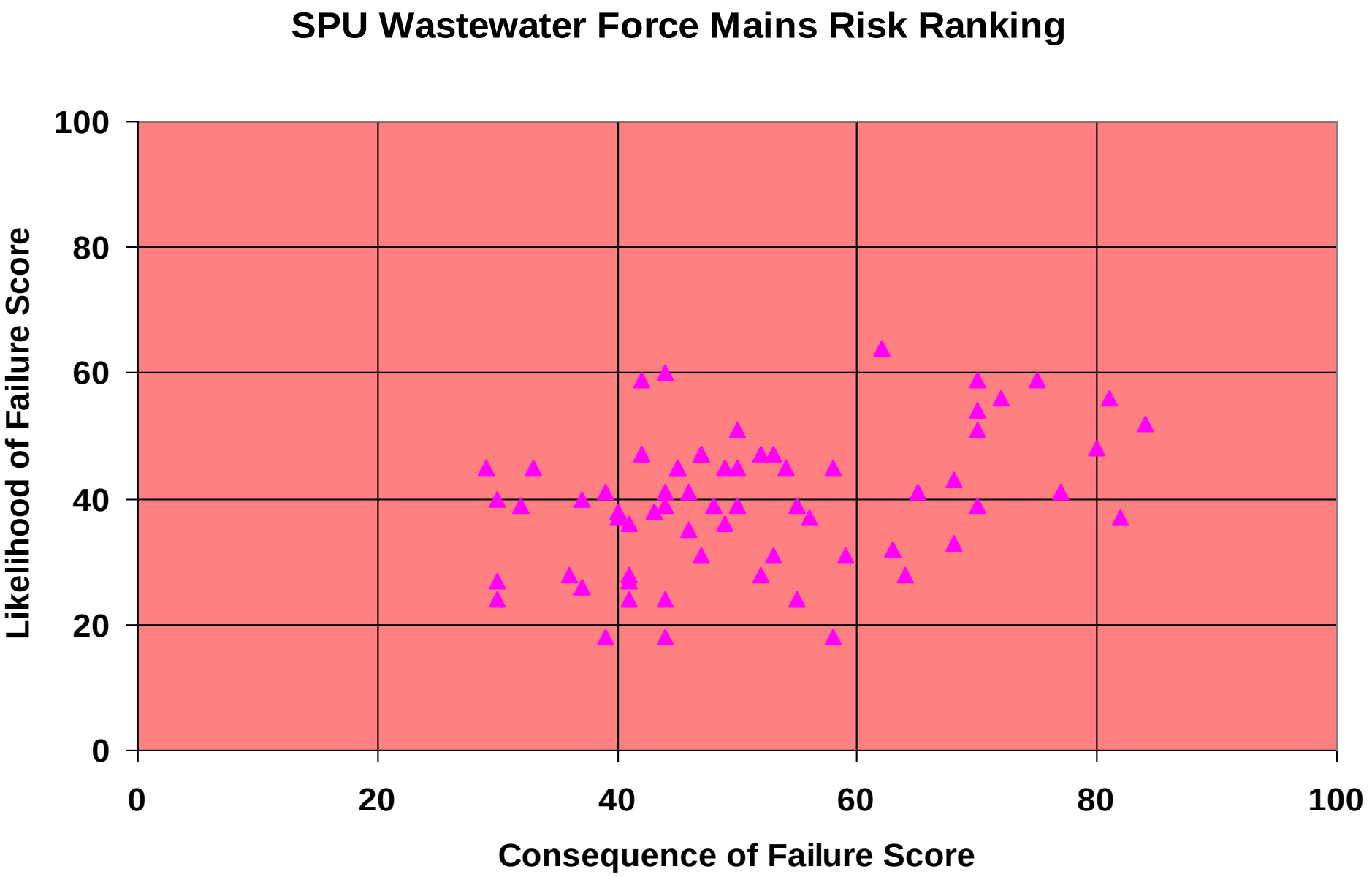
- Project performance measures (baselines)
- Accurate cost and schedule estimates
- Reporting expectations
- Assignment of responsibilities
- Resource commitments
- A tool to manage without formal authority
- Change management protocols
- Commitment to perform in accordance with the plan

RISK MANAGEMENT

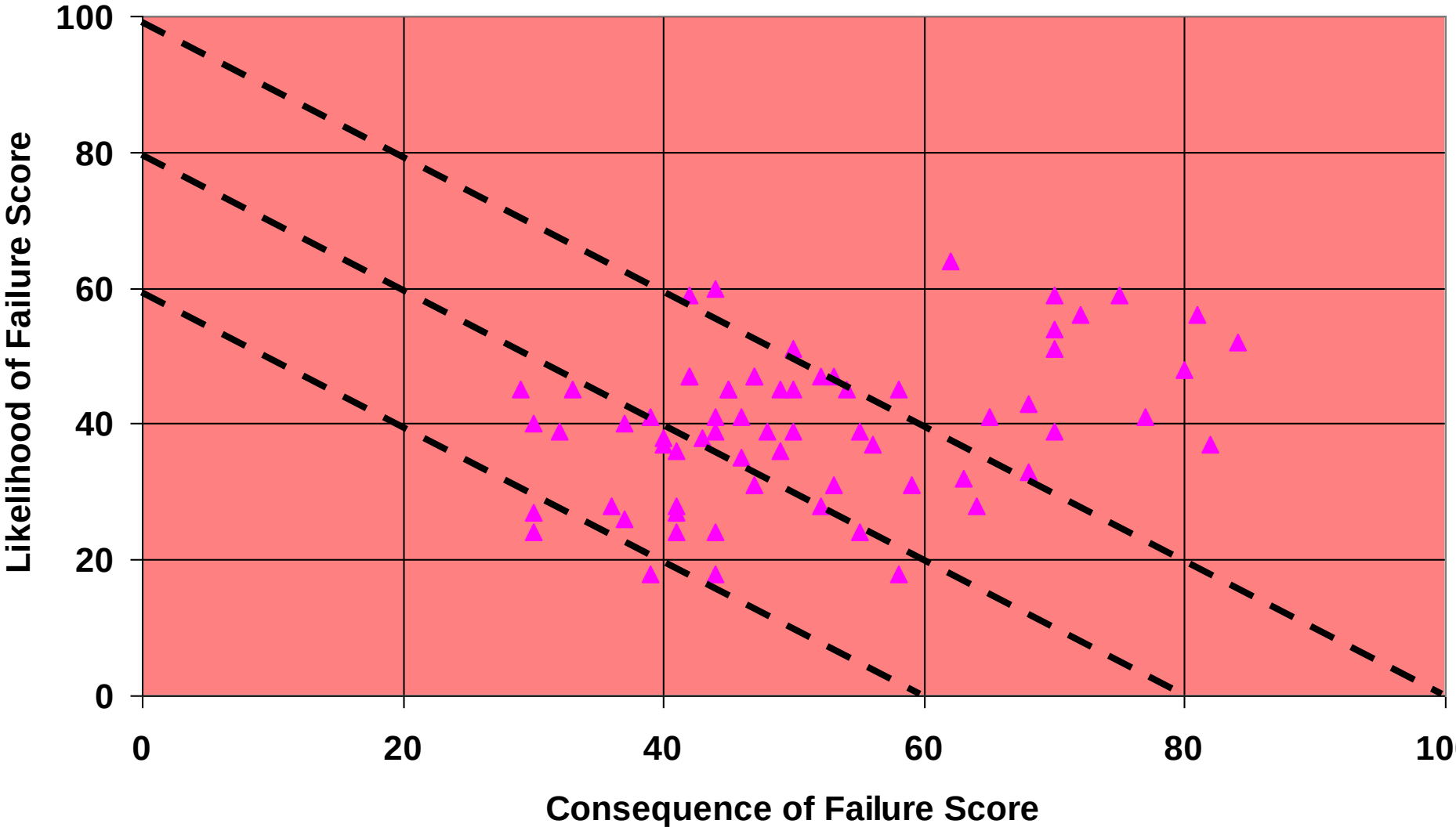
A risk is an uncertain event or condition that – if it occurs – has a negative effect on a project's defined objectives.

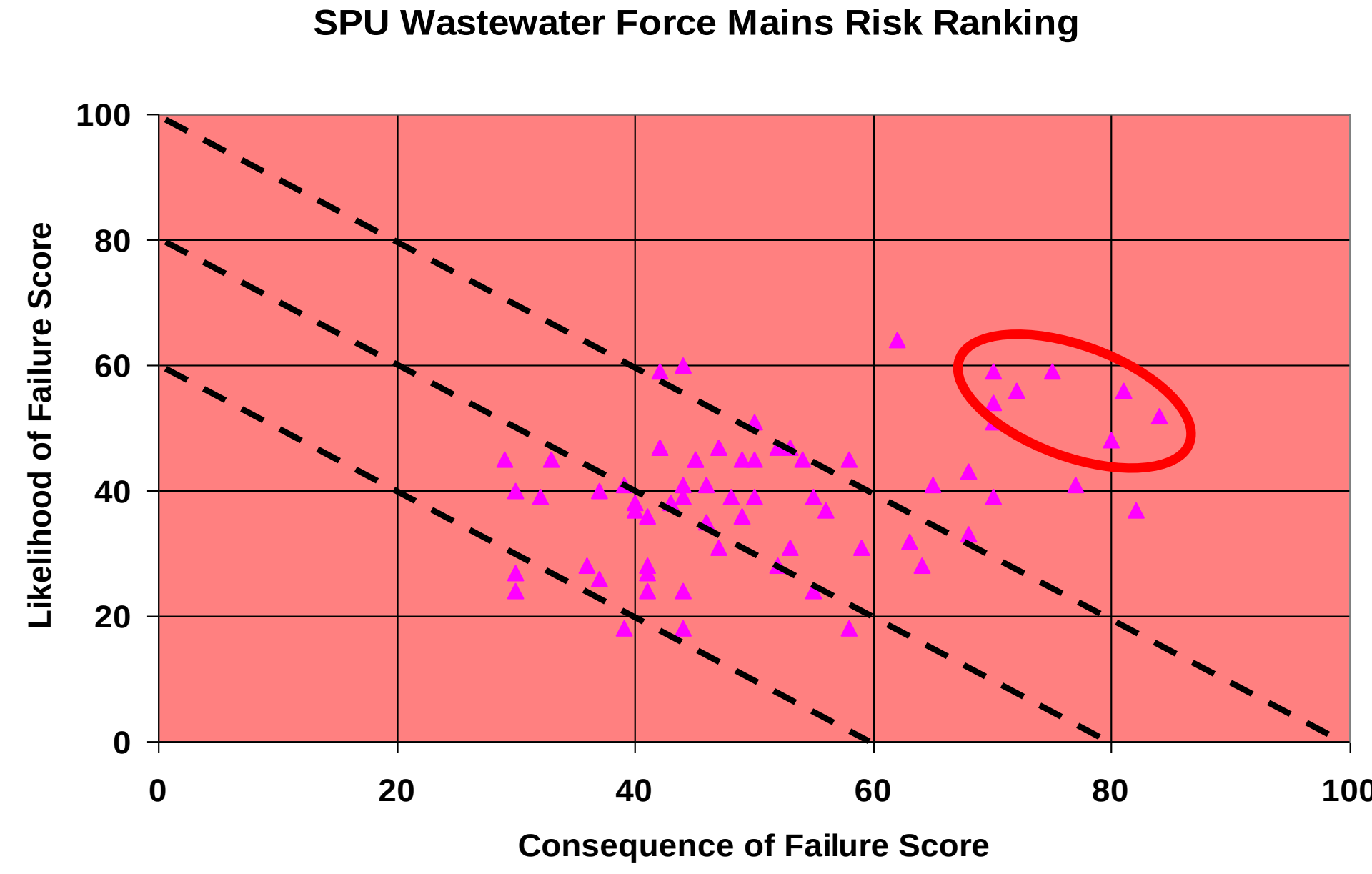
- **Identify**
- **Analyze**
- **Develop Response Strategy**
  - **Accept (watch)**
  - **Mitigate (do something)**
  - **Transfer (contracting approach or insurance)**
- **Monitor**

Risk Assessment

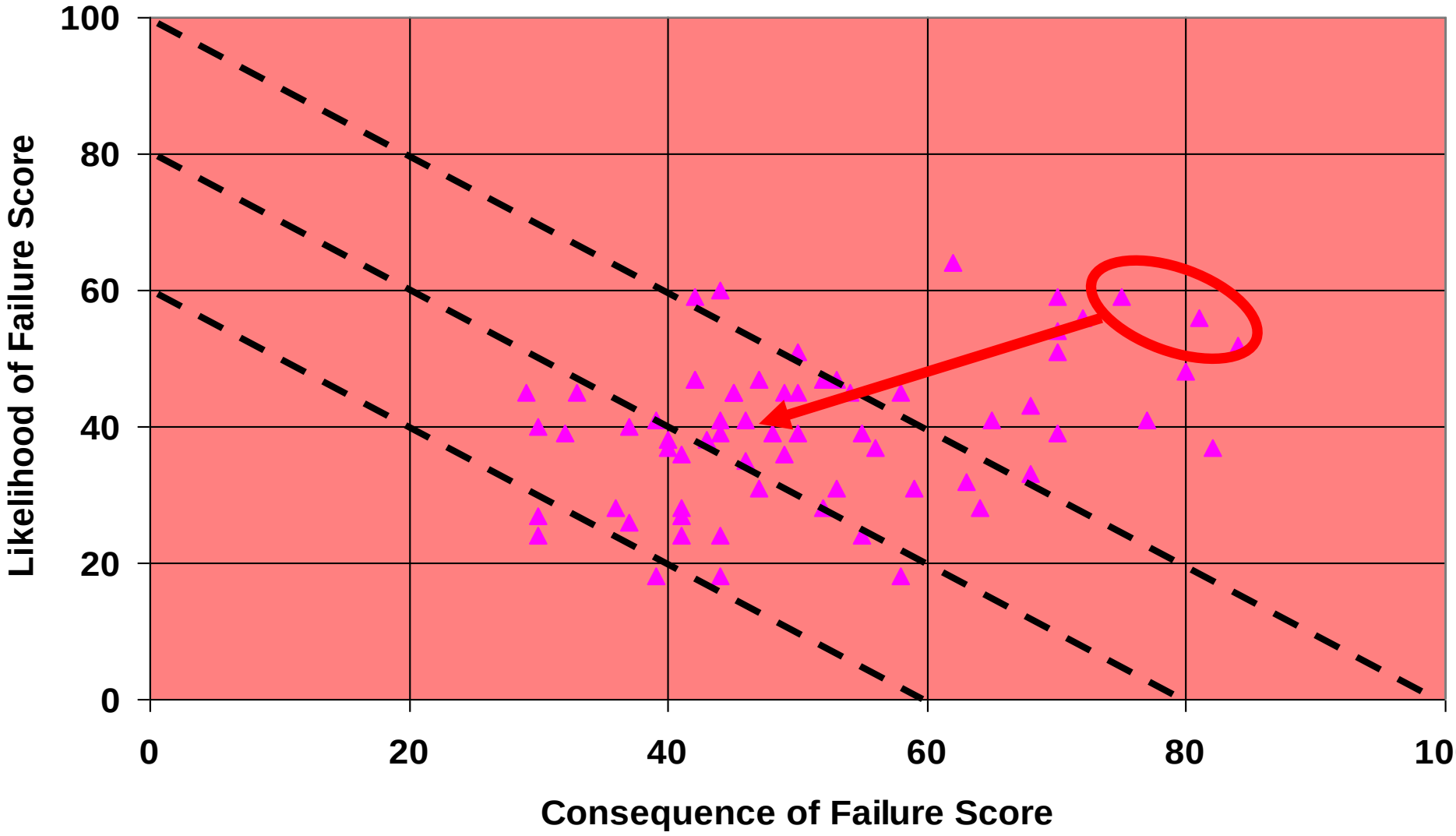


SPU Wastewater Force Mains Risk Ranking




SPU Wastewater Force Mains Risk Ranking
Likelihood of Failure Score
100
80
60
40
20
0
0
20
40
60
80
100
Consequence of Failure Score

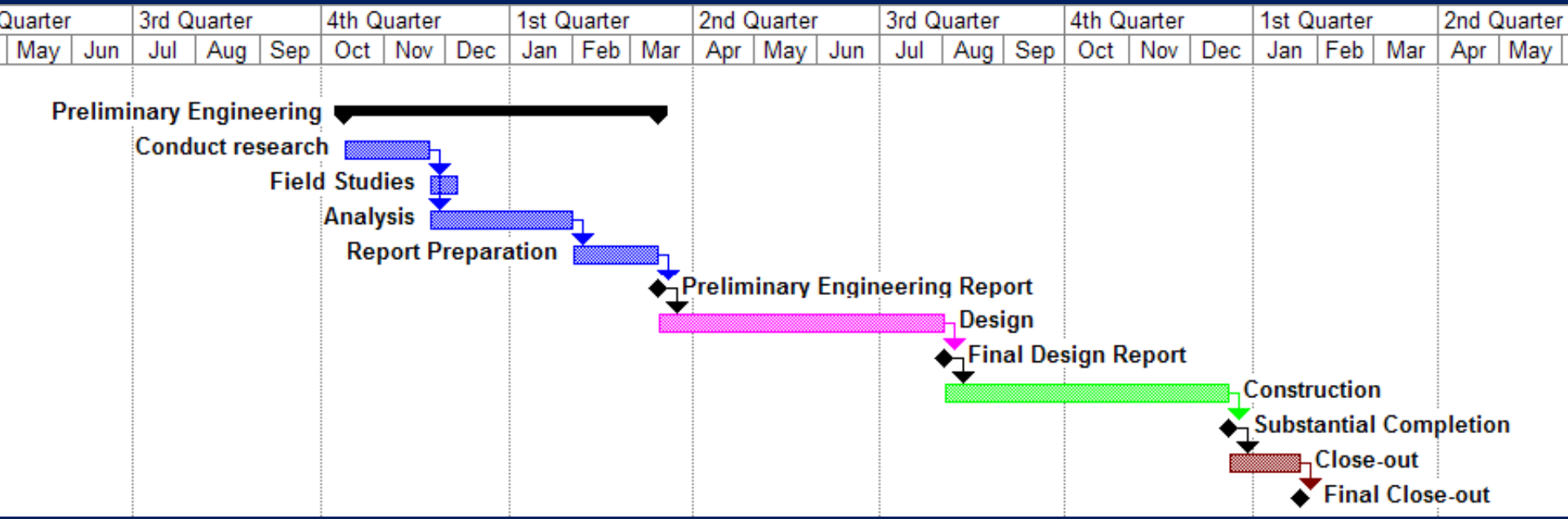
SPU Wastewater Force Mains Risk Ranking



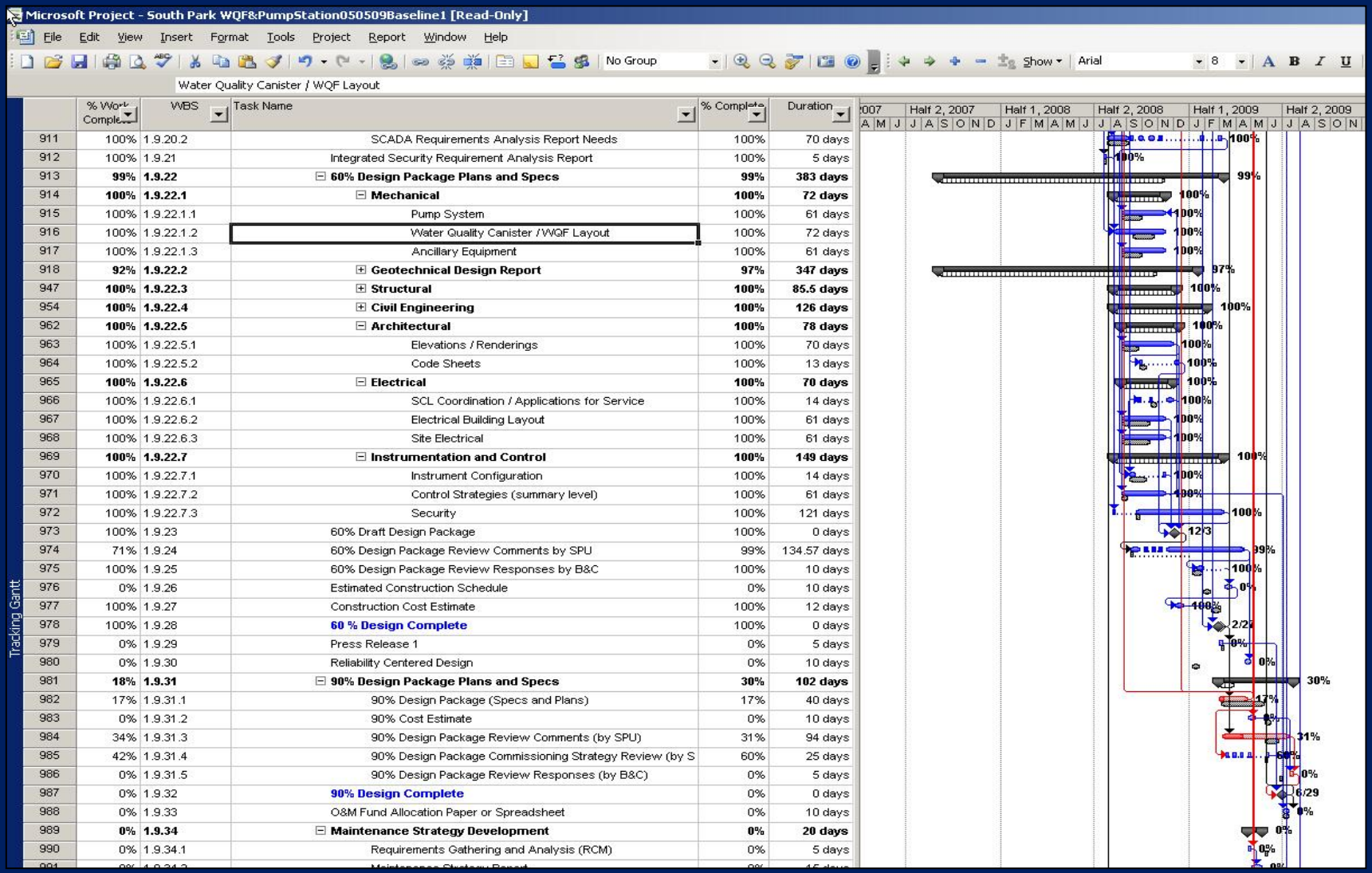
WORK BREAKDOWN STRUCTURE

- A Work Breakdown Structure: defines and organizes the total scope of a project, using a hierarchical tree structure.
- Phases and activities
- Feeds schedule development
- Provides for lessons learned and help with estimating for future projects

EXAMPLE SCHEDULE AND WORK BREAKDOWN STRUCTURE



BETTER UNDERSTANDING OF WORK NECESSARY TO DELIVER PROJECT

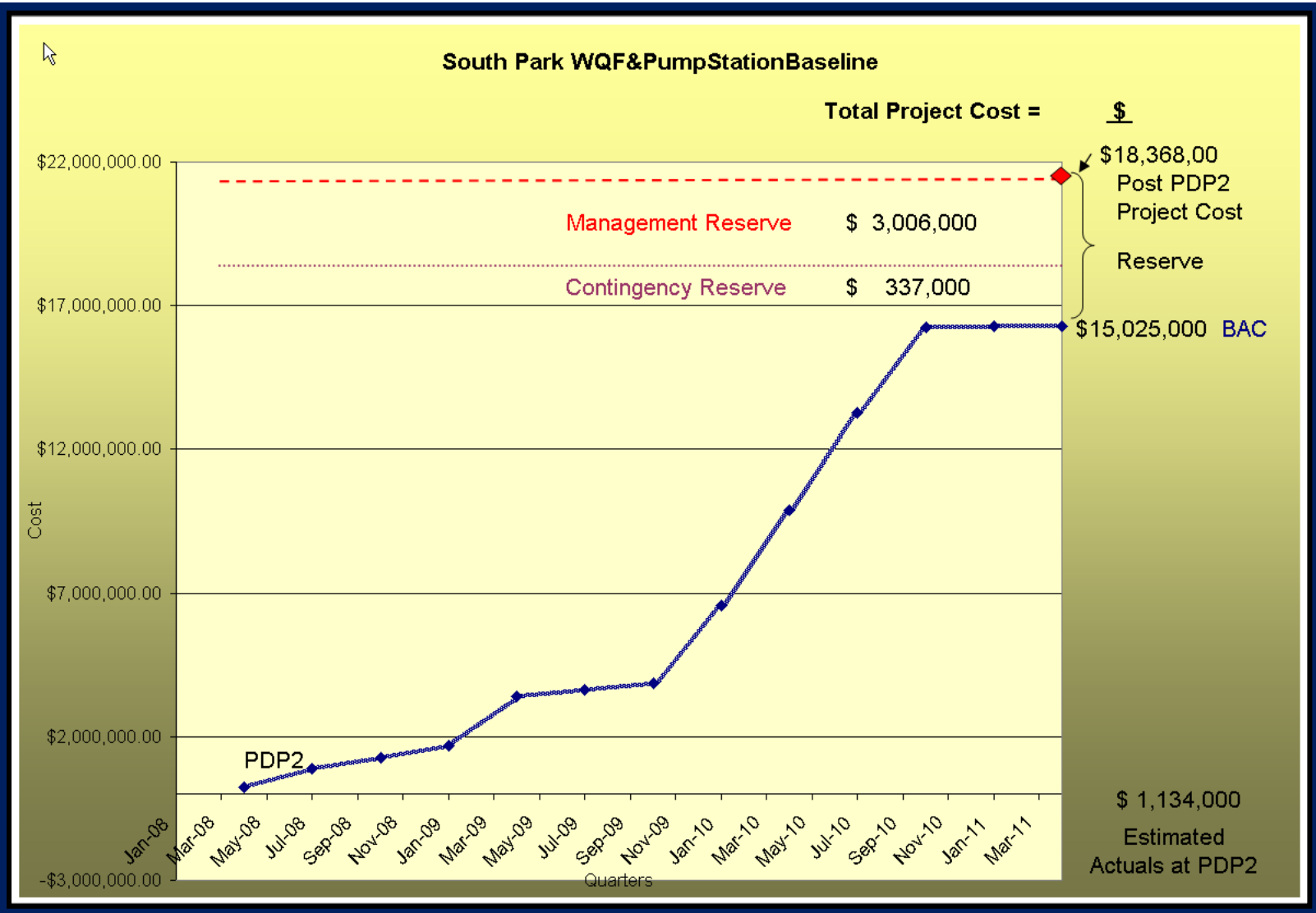


	% Work Comple	WBS	Task Name	% Complete	Duration
911	100%	1.9.20.2	SCADA Requirements Analysis Report Needs	100%	70 days
912	100%	1.9.21	Integrated Security Requirement Analysis Report	100%	5 days
913	**99%**	**1.9.22**	**60% Design Package Plans and Specs**	**99%**	**383 days**
914	**100%**	**1.9.22.1**	**Mechanical**	**100%**	**72 days**
915	100%	1.9.22.1.1	Pump System	100%	61 days
916	100%	1.9.22.1.2	Water Quality Canister / WQF Layout	100%	72 days
917	100%	1.9.22.1.3	Ancillary Equipment	100%	61 days
918	**92%**	**1.9.22.2**	**Geotechnical Design Report**	**97%**	**347 days**
947	**100%**	**1.9.22.3**	**Structural**	**100%**	**85.5 days**
954	**100%**	**1.9.22.4**	**Civil Engineering**	**100%**	**126 days**
962	**100%**	**1.9.22.5**	**Architectural**	**100%**	**78 days**
963	100%	1.9.22.5.1	Elevations / Renderings	100%	70 days
964	100%	1.9.22.5.2	Code Sheets	100%	13 days
965	**100%**	**1.9.22.6**	**Electrical**	**100%**	**70 days**
966	100%	1.9.22.6.1	SCL Coordination / Applications for Service	100%	14 days
967	100%	1.9.22.6.2	Electrical Building Layout	100%	61 days
968	100%	1.9.22.6.3	Site Electrical	100%	61 days
969	**100%**	**1.9.22.7**	**Instrumentation and Control**	**100%**	**149 days**
970	100%	1.9.22.7.1	Instrument Configuration	100%	14 days
971	100%	1.9.22.7.2	Control Strategies (summary level)	100%	61 days
972	100%	1.9.22.7.3	Security	100%	121 days
973	100%	1.9.23	60% Draft Design Package	100%	0 days
974	71%	1.9.24	60% Design Package Review Comments by SPU	99%	134.57 days
975	100%	1.9.25	60% Design Package Review Responses by B&C	100%	10 days
976	0%	1.9.26	Estimated Construction Schedule	0%	10 days
977	100%	1.9.27	Construction Cost Estimate	100%	12 days
978	100%	1.9.28	**60 % Design Complete**	100%	0 days
979	0%	1.9.29	Press Release 1	0%	5 days
980	0%	1.9.30	Reliability Centered Design	0%	10 days
981	**18%**	**1.9.31**	**90% Design Package Plans and Specs**	**30%**	**102 days**
982	17%	1.9.31.1	90% Design Package (Specs and Plans)	17%	40 days
983	0%	1.9.31.2	90% Cost Estimate	0%	10 days
984	34%	1.9.31.3	90% Design Package Review Comments (by SPU)	31%	94 days
985	42%	1.9.31.4	90% Design Package Commissioning Strategy Review (by S	60%	25 days
986	0%	1.9.31.5	90% Design Package Review Responses (by B&C)	0%	5 days
987	0%	1.9.32	**90% Design Complete**	0%	0 days
988	0%	1.9.33	O&M Fund Allocation Paper or Spreadsheet	0%	10 days
989	**0%**	**1.9.34**	**Maintenance Strategy Development**	**0%**	**20 days**
990	0%	1.9.34.1	Requirements Gathering and Analysis (RCM)	0%	5 days

SCHEDULE

- Identify dependencies
  - Ask what do I need to do this task?
  - Connect all the dependent tasks
- Estimate durations and effort
- Validate with Team and Sponsor
- Record Assumptions

IMPROVED & MORE TRANSPARENT COST ESTIMATING



ENGAGE ULTIMATE OWNER

- Operations and Maintenance Involved in PMP Process
- Clarify Resource Needs
- Design Considerations for Operability and Maintainability

STANDARD METHODOLOGIES

- Create a Risk Plan
- Perform Risk Management
- Perform Issue Management
- Form a Project Team
- Develop Initial Scope Statement
- Create Scope Plan
- Perform Scope Management
- Create Schedule/Resource Plan
- Perform Schedule/Resource Management
- Create Cost Plan
- Perform Cost Management
- Perform Change Management
- Develop Lessons Learned
- Close Project

STANDARD METHODOLOGIES

- Create Acceptance Plan
- Perform Acceptance Management
- Create Procurement Plan
- Perform Procurement Management
- Create Quality Plan
- Perform Quality Management
- Create Communications Plan
- Perform Communications Management
- Planning Review and Approval
- Develop Deliverables
- Review Project Performance

SCALABLE

- For PMPs and Standard Methodologies: The amount of effort depends on the needs of the project
- Make sure there is value
- Cost effectiveness

CONTRACTING STRATEGIES

- Consulting Services
- Construction
  - Job Order Contracting
- Alternative Contracting
  - Design-Build
  - General Contractor/Construction Manager

VALUE ENGINEERING

- Is there a better way?
- Technical experts independent from project team
- All projects over $5M

PROJECT DELIVERY IMPROVEMENT STRATEGY

Governance

- Stage Gates
- Business Cases
- Project Delivery Oversight Committee
- Change/Variance Management
- Customer Centric
- TripleBottomLine
- Decision Making Processes

STAGE GATES

INITIATION

DEVELOPMENT

DELIVERY

COMPLETION

Investigation, Options Assessment & Strategy Development

Design and Prepare Bid Documents

Solicit Bids for Delivery Contract

Deliver, Commission & Hand Over

Close Out

GATE 1

INITIATION

GATE 2

DEVELOPMENT FUNDING

(Business Case Presented for the first time)

GATE 3

COMMENCE DELIVERY

(Business Case Review)

GATE 4

AWARD DELIVERY CONTRACT

(Business Case Review)

GATE 5

COMPLETION

BUSINESS CASES

- Consider various options for meeting customer needs
- Assess benefits & costs
- Consider risk
- Consider Triple Bottom Line
- Make decisions based on objective analysis

PROJECT DELIVERY OVERSIGHT COMMITTEE

The Project Delivery Oversight Committee (PDOC) exists to improve the delivery of Capital Improvement Projects (CIP) projects in Seattle Public Utilities. In so doing, the PDOC ensures the creation of realistic project budgets and schedules by approving Project Management Plans (and changes to the plan); by approving change management policies and procedures; by serving as the change approval board; and by guiding project delivery improvement initiatives.

CHANGE MANAGEMENT

- Type/source of change
- Magnitude of change
- Change governance
- Thresholds
- Use of contingency

CUSTOMER CENTRIC DECISIONS

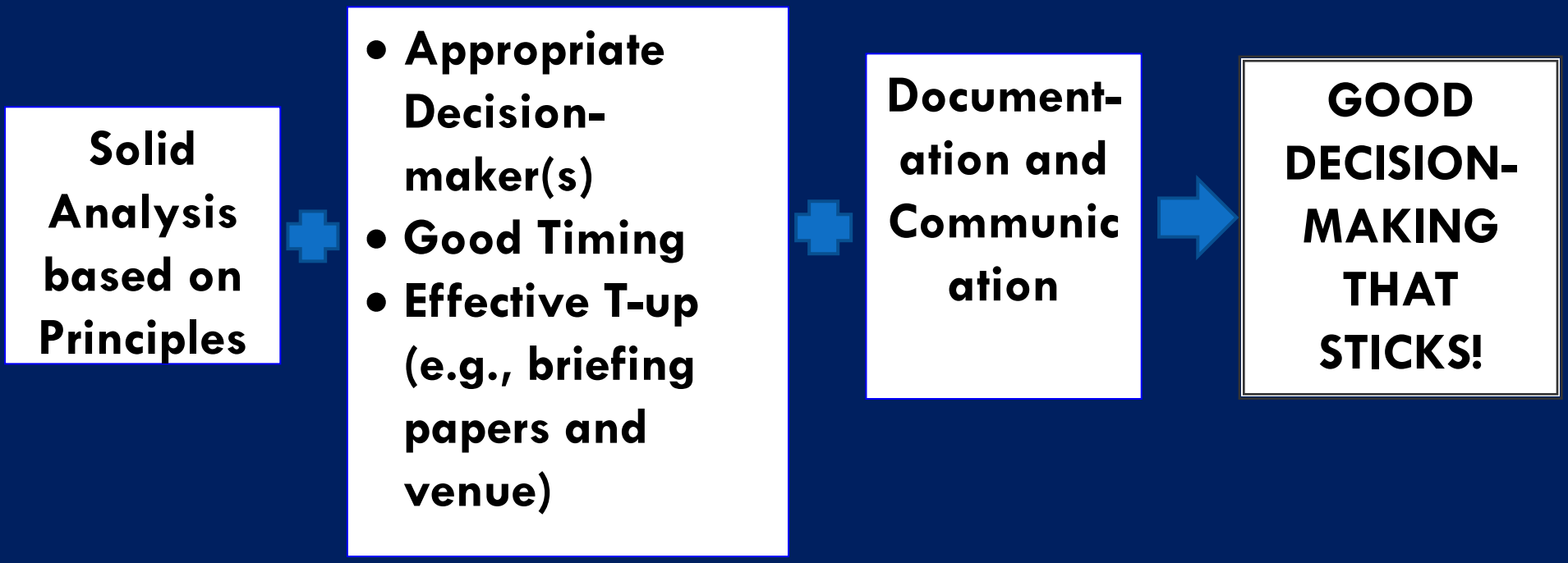
- Impact on Service Levels
- Customer Outcomes
- What would a customer think?
- Future customers

TRIPLE BOTTOM LINE

- Financial
- Social
- Environmental

HOW TO MAKE DECISIONS STICK

Effective "Up-Front Work" helps to prepare for the activities in each of the blue boxes below, so that we don't find ourselves needing decisions without adequate time.



PROJECT DELIVERY IMPROVEMENT STRATEGY

Project Controls

- Reporting
- Earned Value Reports
- Enterprise Project Management System (EPMS)
- QA/QC
- Design Standards & Guidelines

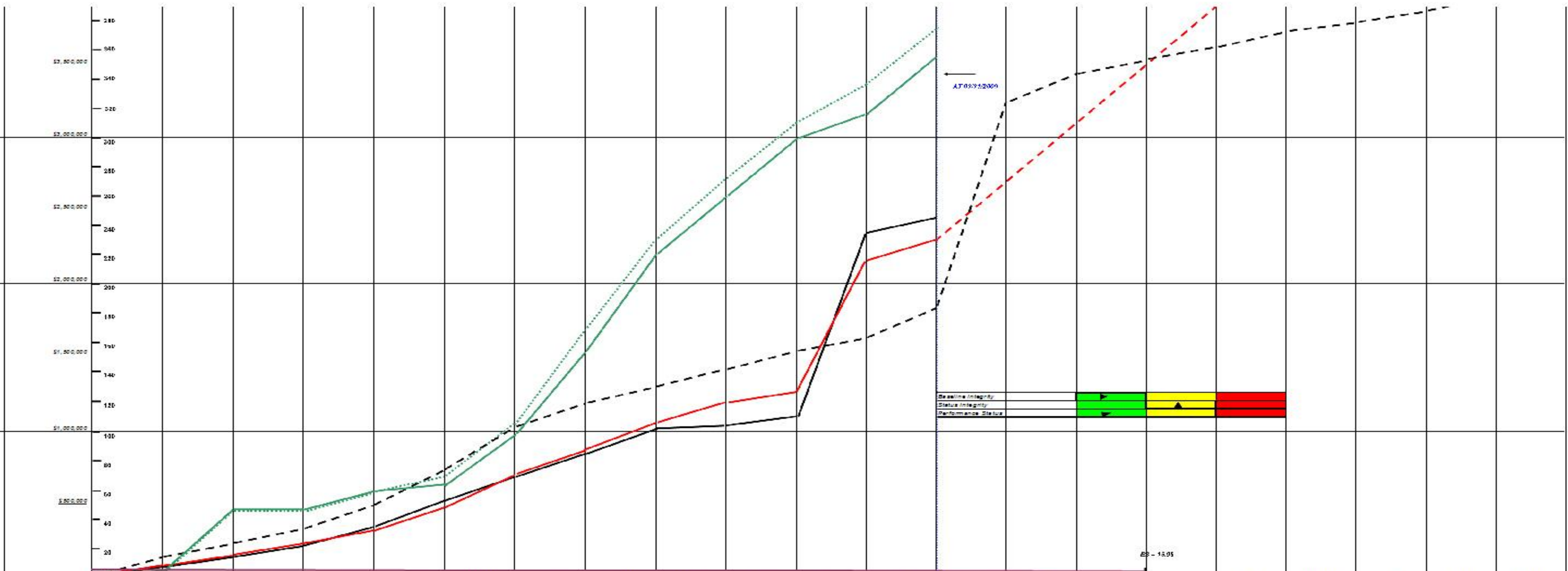
PROJECT CONTROLS

- Scope
- Schedule
- Budget
- Resources
- Risk

EARNED VALUE REPORTING

Status as of: March 30, 2009

South Park Pump Station and Water Quality Facility Project
C308011



Month	April	May	June	July	August	September
BCWS	$143,655	$226,770	$326,439	$491,840	$742,265	$1,024,350
BCWP	$79,358	$155,206	$229,722	$346,865	$505,659	$675,959
ACWP	$80,631	$143,423	$222,691	$336,570	$509,597	$691,300
SV	-$64,297	-$71,563	-$96,716	-$145,972	-$235,599	-$348,391
CV	-$1,273	$11,753	$7,032	$7,295	-$3,227	-$12,311
SPI	0.55	0.65	0.70	0.70	0.65	0.66
CPI	0.95	1.05	1.03	1.02	0.99	0.95
EAC	$17,124,919	$15,554,104	$16,345,171	$16,505,555	$16,971,523	$17,170,172
TCPI	1.00	1.00	1.00	1.00	1.00	1.00
Sched. Completes	4	47	47	55	69	105
Actual Completes	4	47	47	55	65	95
BEI	1.00	1.00	1.00	1.00	0.94	0.92

Month	October	November	December	January	February	March
BCWS	$1,176,291	$1,265,679	$1,420,075	$1,526,195	$1,615,729	$1,540,274
BCWP	$835,524	$965,164	$1,022,526	$1,081,167.10	$2,350,941.03	$2,447,751.64
ACWP	$880,241	$1,066,965	$1,189,617	$1,251,836.40	$2,152,149.54	$2,278,464.21
SV	-$340,767	-$302,516	-$398,251	-$445,031	$735,212	$607,477
CV	-$44,716	-$101,804	-$166,791	-$170,669	$198,791	$169,287
SPI	0.71	0.76	0.72	0.71	1.46	1.22
CPI	0.95	0.90	0.86	0.86	1.09	1.07
EAC	$17,766,956	$18,642,225	$19,595,257	$19,526,552	$15,425,275	$15,695,050
TCPI	1.02	1.05	1.06	1.09	0.51	0.51
Sched. Completes	167	230	272	310	227	276
Actual Completes	154	220	259	294	216	256
BEI	0.92	0.96	0.95	0.95	0.94	0.93

Month	April	May	June	July	August	September	October	November	December
BCWS	$2,253,952	$2,427,514	$2,541,650	$2,627,741	$2,729,843	$2,791,136	$2,860,095	$2,925,423	$4,022,297
BCWP	$2,456,512.24								
ACWP	$2,298,666.22								
SV	-$797,440								
CV	$157,526								
SPI	0.75								
CPI									
EAC									
TCPI									
Sched. Completes									
Actual Completes									
BEI									

BCWS - Budgeted Cost of Work Scheduled: The budgeted value of the work that should be completed at this point in time
BCWP - Budgeted Cost of Work Performed: The budgeted value of the work that *IS* actually completed at this point in time
ACWP - Actual Cost of Work Performed: The actual cost of the work that has been completed at this point in time.
SV - Schedule Variance: (BCWP - BCWS) The variance between what is scheduled to be done and what is actually done.
CV - Cost Variance: (BCWP - ACWP) The variance between the budgeted cost of the work that has been accomplished and the actual cost of that work
SPI - Schedule Performance Index: (BCWP/BCWS) A measure of the efficiency of schedule accomplishment.
CPI - Cost Performance Index: (BCWP/ACWP) A measure of the efficiency with which the project budget is being expended
EAC - Estimate at Completion: (BAC-BCWP)/CPI The calculated cost of the project at completion
TCPI - To Complete Performance Index: ((BAC-BCWP)/(BAC-ACWP)) The CPI that must be achieved in order to complete the project for the original budget
Sched. Completes - The number of scheduled activities that should be completed at this point in time
Actual Completes - The number of scheduled activities that are actually completed at this point in time.
BEI - Baseline Execution Index: (Actual Completes / Scheduled Completes) A measure of the efficiency with which the scheduled activities are being completed
ES - Earned Schedule: (AT * SPI) This represents the actual schedule accomplishment as time rather than as a volume of work
AT - Actual Time (in months of project duration): The "status as of" date April 1, 2009

Project Manager: Jim Johnson
Project Specifier: Jonathan Batara
Project Engineer: Liz Anderson
Project Planning and Control: Liviu Prisecaru

ENTERPRISE PROJECT MANAGEMENT SYSTEM (EPMS)

- A technology tool
- Maintain data
- Run scenarios
- Performance reports

QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

PROJECT DELIVERY IMPROVEMENT STRATEGY

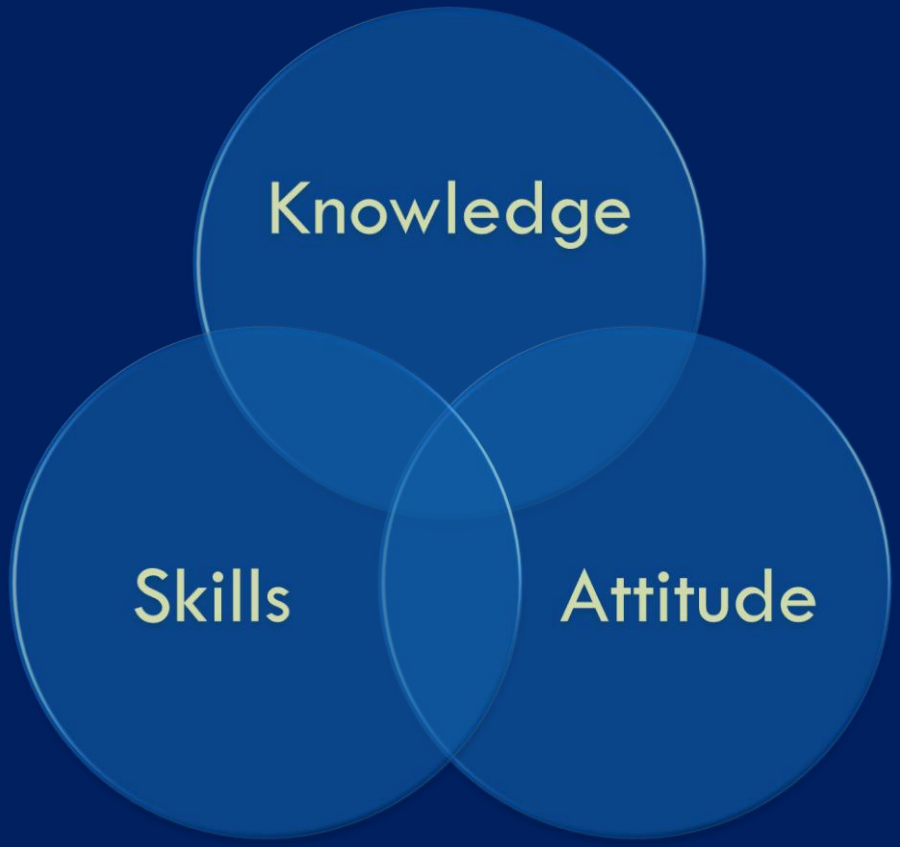
Capacity Building

- Train-the-trainer
- Toolkits
- Web Tools
- Clarity of Expectations
- First & Second Tier Competencies
- Continuous Improvement

PROJECT MANAGEMENT SKILLS

- Visible leadership
- Okay with Change
- Communication – keep your team informed
- Technical foundation
- Team builder
- Empathetic
- Know your team – personality types
- Able to foresee critical items or problems
- Problem solver
- Good negotiator
- Financial sense
- Assertive
- Organized
- Effective delegator
- Good listener

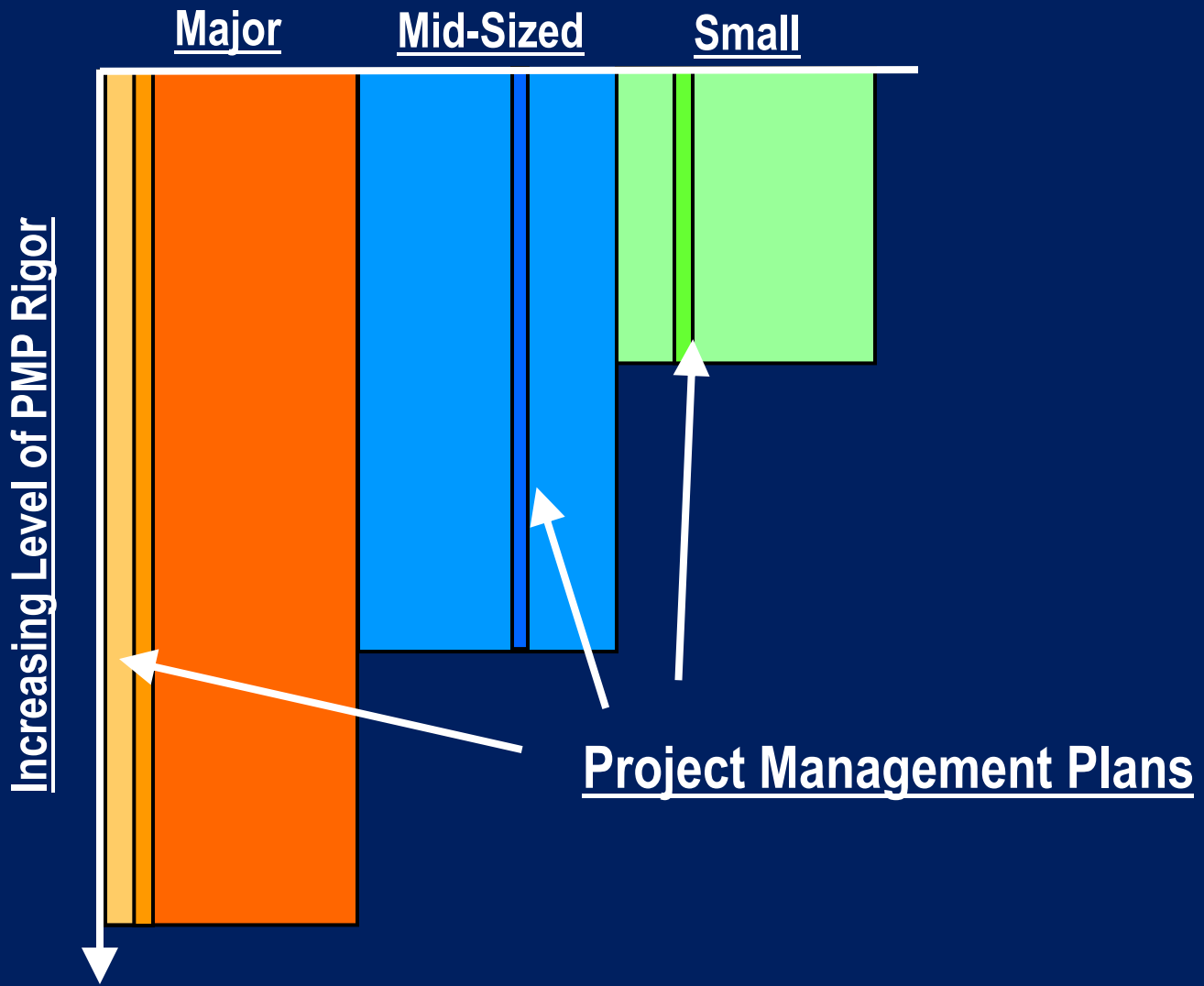
CAPACITY BUILDING



CAPACITY BUILDING STRATEGIES

- Classroom Training
- Real-time training and modeling
- Resources available
- Information

PROJECT PLANNING



CONTINUOUS IMPROVEMENT

Make real-time adjustments and collect information to improve the delivery of future projects.

PROJECT DELIVERY IMPROVEMENT STRATEGY

Teaming

- Effective Leadership
- Group Buy-In
- Collaboration
- Shared Accountability
- Clarity of Expectations

TEAMING

- Involve the right people, at the right time, in the right way
- Create Shared Accountability
- Effective Communication
- Collaborative Approach
- Clarity of Expectations

TEAMING TOOLS

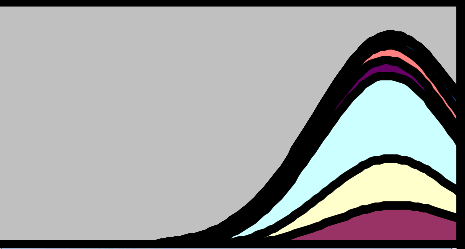
- Introductions
- Ground Rules
- Style Assessments
- Collaborative Problem Solving
- Soliciting Feedback


U = USA
K = KARL
L = LOYD
G = GARY
M = MARNIE
B = BETH
J = JAN
P = PAM
JU = JULIUS


Industrial Waste Dis
NPDES
SEFA

OVERALL EXPECTED OUTCOMES

- Effective and Cost Efficient Project Delivery
- Meet Asset Management Objectives throughout Project Implementation
- Accurate Cost and Schedule Estimates
- Fewer Changes From Baseline
- Predictability
- Confidence of Elected Officials
- Meet Customer Needs
- Continuous Improvement
- Satisfied Employees



ASSET MANAGEMENT

Thank you!!

liz.kelly@seattle.gov

Seattle Public Utilities